UC Merced and University Community Project
Draft Environmental Impact Statement/Environmental Impact Report

Volume 2

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University of California

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4.8 HYDROLOGY AND WATER QUALITY

4.8.1 INTRODUCTION

This section describes the existing environmental conditions pertaining to the hydrology and water quality on the project site and its vicinity. The description of the existing conditions is followed by a discussion of the regulatory setting. The section evaluates and discusses the consequences associated with construction of the project. The primary concerns related to hydrology and water quality are increased urban runoff from the development of the Campus and University Community and the potential of this increased runoff to result in water quality impacts and downstream flooding; short-term construction phase impacts on water quality; and effect of groundwater extraction and increased impervious surfaces on local and regional groundwater levels.

The following sources of information were used in the preparation of this section:

- Merced Water Supply Plan Update. City of Merced, Merced Irrigation District, and the University of California, Merced. Prepared by CH2MHill. Sept 2001.
- University Community Plan (UCP). Merced County Planning Office. Adopted 2004.
- University of California, Merced. Long Range Development (LRDP) Plan Final EIR. Prepared by URS Corporation.
- Merced County University Community Plan. Supplemental to the Draft Environmental Impact Report, Final Environmental Impact Report. Prepared by EIP Associates. July 2004.
- Small Entity Compliance Guide. *Effluent Limitation Guidelines and Pretreatment Standards* (40 CFR 437) Prepared by the Environmental Protection Agency (US EPA). 2000.
- California Groundwater Bulletin 118. San Joaquin Valley Groundwater Basin, Merced Subbasin. Prepared by Department of Water Resources. 2004.
- Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments (CVRWQCB). Prepared by State Water Resources Control Board Central Valley Region. 2002.
- The Water Quality Control Plan (Basin Plan) for the Sacramento and San Joaquin River Basin. Fourth edition. Prepared by Regional Water Quality Control Board. Central Valley Region. 2007.
- City of Merced 2005 Urban Water Management Plan. Draft Final. Prepared by Brown and Caldwell. November 2005.

In response to the Notice of Preparation and the Notice of Intent issued for this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (see **Appendix ES**), one commenter expressed concern whether an adequate water supply would be available to serve the Campus and University Community. The adequacy of water supply is analyzed in **Section 4.14, Utilities and Service Systems.** The effects of groundwater extraction to serve the water needs of the Proposed Action are addressed in this section and in **Section 5.0, Cumulative Impacts**.

4.8.2 AFFECTED ENVIRONMENT

This section presents existing surface and groundwater conditions in the project region. The regional conditions described below are pertinent to the Proposed Action and all build alternatives.

4.8.2.1 General Climate, Precipitation, and Topography

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada, and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The proposed UC Merced Campus and associated University Community are located in the middle-eastern portion of the San Joaquin Valley, in the eastern portion of Merced County, and northeast of the Merced city limits. The land surrounding the Campus and University Community consists of gentle rolling hills and flatland primarily used for agriculture (Merced County 2004). The general gradient of this area is to the west and southwest.

The climate of the valley floor around the project area is arid to semi-arid with dry, hot summers and mild winters. Summer temperatures may be higher than 100 degrees Fahrenheit (°F) for extended periods of time; winter temperatures are only occasionally below freezing (Jones & Stokes 1998). The Merced region averages 11 to 13 inches of rain per year increasing eastward Department of Water Resources ((DWR) Bulletin 118 2004). The maximum precipitation of a 100-year frequency, 24-hour storm duration event at Merced Gauge No. 2 is 2.81 inches of rainfall (Merced County 2004). The winter snowpack, which accumulates above 5,000 feet elevation, primarily in the Sierra Nevada, supplies the vast majority of water in the basin. The streams in the western portion of the county contribute little to the water totals in the valley because the Coast Range is too low to accumulate a snowpack and its east slope is subject to a rain shadow phenomenon, therefore producing only seasonal runoff.

4.8.2.2 Surface Water Resources

The San Joaquin River is the principal river within the project area. There are many reservoirs, streams, creeks, and agricultural drains in this region, including Lake Yosemite. According to the US EPA Unified Watershed Assessment (UWA), the Clean Water Action Plan places the UC Merced Campus and

University Community, as well as the City of Merced, within the Middle San Joaquin-Chowchilla watershed (United States Geological Survey (USGS) Catalog unit No. 1804001) (Merced County 2004). This watershed area is included in the UWA program as a Priority Category I Watershed. A Category I watershed is defined as a watershed the environmental quality of which needs restoration.

The Proposed Action and two of the other build alternatives are located to the southeast of Lake Yosemite on the eastern side of the San Joaquin Valley floor. **Figure 4.8-1, Pre-Development Watersheds,** presents the project site watersheds. The primary drainage features in the vicinity of the project are Cottonwood Creek, Fahrens Creek, and Black Rascal Creek (via Rascal Creek diversion Channel). These creeks are tributaries of Bear Creek, which ultimately flows into the San Joaquin River. Other drainages include numerous canals and ditches such as the Main Canal, Le Grand Canal, and the Fairfield Canal. These canals divert water from the Merced River and Lake Yosemite. Lake Yosemite is fed by water from the Main Canal, which receives its water from the Merced River. Water discharges from Lake Yosemite via the Le Grand and Fairfield Canals. Lake Yosemite and its canals are used primarily for irrigation and secondarily, for flood control (Merced County 2004). Bear Creek, Black Rascal Creek, and Fahrens Creek flow through the City of Merced.

4.8.2.3 Regional Watershed

The San Joaquin Valley is a long trough that is divided lengthwise into two major subbasins that drain to different locations. The San Joaquin subbasin drains the northern portion of the valley and the Tulare subbasin drains the southern portion. Merced County and the proposed project are located within the northern San Joaquin subbasin.

In the northern portion of the valley, surface water runoff is drained into the San Joaquin River where it flows into the Sacramento- San Joaquin Delta before it empties out into the Pacific Ocean. Surface water in the southern portion of the valley flows into the Tulare subbasin where there is no outlet. Only during rare high flood flows in the Tulare subbasin is when water can reach an outlet and it is then able to drain into the San Joaquin River.

Merced County is further divided into two subbasins by the US EPA. One subbasin drains into the Merced River and the other drains into the San Joaquin River. The proposed project would drain into the San Joaquin subbasin. Located within the Middle San Joaquin–Lower Chowchilla Watershed, as defined by the EPA, are nine major streams and rivers. These include Bear Creek, Burns Creek, Chowchilla River, Deadmans Creek, Fresno River, Los Banos Creek, Mariposa Creek, Owens Creek, and the San Joaquin River. The watershed also includes 217 lakes and encompasses approximately 8,926 acres (Merced

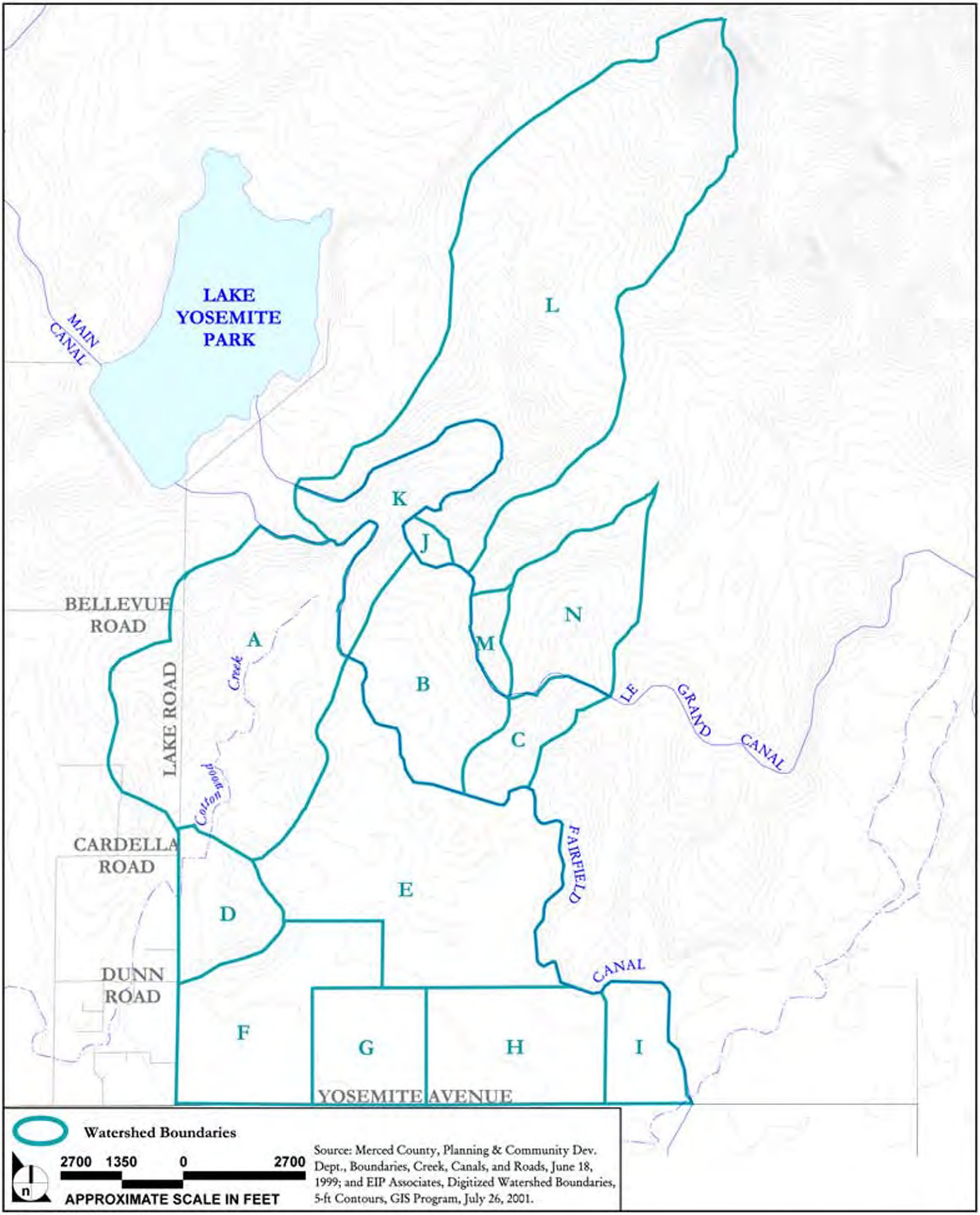
County 2004). This watershed is defined by the US EPA UWA Program as a priority Category I watershed, indicating that the watershed needs restoration (Merced County 2004).

4.8.2.4 Flooding

The Federal Emergency Management Agency (FEMA) provides information on flood hazard and frequency for cities and counties on its Flood Insurance Rate Maps (FIRM). FEMA identifies designated zones to indicate flood hazard potential. In general, flooding occurs along waterways, with infrequent localized flooding also occurring due to constrictions of storm drain systems or surface water ponding. The San Joaquin River and its tributaries that flow through Merced, Stanislaus and Fresno counties form part of the drainage system for over 9,000 square miles of the Sierra Nevada and foothill region. High flows of moderate duration in these rivers and streams can result in flooding and can occur from intense rainstorms. In addition, snowmelt in the Sierra Nevadas can produce high flows of longer duration during the spring. There are areas southeast of the University Community that are located in Zone A. This includes the area to the south and east of the corner where Yosemite Avenue crosses the Fairfield Canal. This area is zoned as special flood hazard area subject to inundation by the 1 percent annual flood event. Zone A is determined to have no base flood elevations.

Lake Yosemite has a 53-foot-high earthen dam located along the lake's southwest side. The lake is owned by the Merced Irrigation District (MID) and is regulated by the DWR Division of Safety of Dams (DSOD). The area to the west and southwest of the lake, and not within the existing UC Merced Campus or University Community boundaries, would experience a gradual flooding if the earthen dam were to fail (Merced County 2004). Failure of the earthen dam would occur if the lake were overtopped by water. According to the MID, the crest of Lake Yosemite Dam is approximately 4 feet higher than the edge of the rim of the lake (Merced County 2004).

The Le Grand and Fairfield canals traverse the northern and central portions of the Campus and the eastern boundaries of the University Community. These canals are constructed with earthen embankments and are subject to erosion. The canals are owned and operated by MID. According to MID, the Campus and University Community areas could become flooded if the embankments failed or if the tops were over filled due to excess volume of water. In addition, the levees could also fail due to burrowing animals within the levees (Merced County 2004). According to MID, the canals often need to be repaired due to erosion caused by seepage and animal burrowing (Merced County 2004).



SOURCE: Merced County - See notes above

FIGURE **4.8-1**

Pre-Development Watersheds

None of the watercourses within the proposed project are included in the 100-year floodplain as defined by FEMA (FEMA 2006). Areas that are adjacent to Black Rascal Creek and on the east side of Fairfield Canal (not within the proposed project site) are within the 100-year floodplain (FEMA 2006). All of the runoff water on the east side of Fairfield Canal is diverted to the diversion channel, which drains into Bear Creek. Bear Creek is located to the south of the planning area and receives runoff flows from Fahrens and Black Rascal Creek. Bear Creek, Black Rascal Creek, and Fahrens Creek, all flow through the city of Merced, and are tributaries to the San Joaquin River. These creeks are part of the Merced County Streams Group. Lack of channel capacity and problems of erosion and sedimentation, which further reduce channel capacity, are responsible for flooding along all of the creeks in the Merced County Streams Group (Merced County General Plan Chapter V).

4.8.2.5 Surface Water Quality

Surrounding land uses largely affect surface water quality, with both point source and nonpoint-source discharges contributing contaminants to surface waters. The land surrounding the Campus and University Community generally consists of rolling foothills primarily used for agriculture (Merced County 2004). Runoff from agricultural areas is characterized by constituents such as fertilizers, herbicides, and pesticides, and often contains bacteria, high nutrient content and dissolved solids.

Flows into waterways during the dry season, not related to the treated wastewater effluent discharges, may be entirely comprised of nonpoint source runoff. During the wet season, stormwater discharge conveys precipitation from areas of saturation or impermeable surfaces to low lying collection areas and drainages. "First flush" storm events, during which pollutants that have accumulated throughout the dry season are concentrated with little dilution by the initial storm event of the season, are thought to have the largest impact on receiving waters. Local drainage ways in the project area serve as the first line of non-point source pollution treatment.

The impacts of nonpoint source pollutants on aquatic systems are many and varied. Polluted runoff can result in adverse effects to aquatic ecosystems, public use, human health from ground and surface water contamination, damage to and destruction of wildlife habitat, decline in fisheries, and loss of recreational opportunities. Small soil particles washed into streams can smother spawning grounds and marsh habitat. Suspended particulates can restrict light penetration into water and limit photosynthesis of aquatic biota. Metals and petroleum hydrocarbons washed off from roadways and parking lots, and fertilizers, pesticides and herbicides from landscaped areas, may cause toxic responses in aquatic life or contaminate possible water supply sources such as reservoirs or aquifers.

The CWA Section 303(d) requires states to adopt water quality standards for all surface waters in the United States. Section 303 (d) establishes the Total Maximum Daily Load (TMDL) process to assist in guiding the application of state water quality standards, requiring states to identify streams whose water quality is "impaired" (affected by the presence of pollutants or contaminants) and to establish the TMDL or the maximum quantity of a particular constituent that a water body can assimilate without experiencing adverse effect (US EPA 2000). Where multiple uses exist, the water quality standard must protect the most sensitive use. The State Water Control Board (SWRCB) and the applicable Regional Water Quality Control Board (RWQCB) are responsible for implementing and ensuring compliance with the provisions of the federal CWA and the California Porter-Cologne Water Quality Control Act.

The 303(d) lists breaks up the San Joaquin River into four sections: Bear Creek to Mud Slough, Mendota Pool to Bear Creek, Mud Slough to Merced River, and the Merced River to South Delta Boundary. The San Joaquin River from Bear Creek to Mud Slough is listed for boron, chloropyrifos, diazinon, DDT, Group A pesticides, electromagnetic conductivity (EC), mercury, and unknown toxicity. The San Joaquin River from Mendota Pool to Bear Creek is listed for all the above except mercury. The San Joaquin River from Mud Slough to Merced River is listed for boron, DDT, Group A pesticides, EC, mercury, selenium, and unknown toxicity. The San Joaquin River from Merced River to the Tuolumne River is listed for DDT, Group A pesticides, mercury, and unknown toxicity (SWRCB 2002).

The streams in eastern Merced County contain low amounts of total dissolved solids (TDS) originating from the Sierra Nevada, while the streams in western Merced County have a much higher salinity rate due to the sediments that compromises the Diablo Range of the Coastal Mountains (Merced County Planning Department 1989 and Merced County 2004). Similarly, the stream flow from the Merced River in the northern part of the County is of very good quality, but gradually decreases south through the San Joaquin Valley due to the inflow of excess irrigation water and agricultural runoff (Merced County Planning Department 1989; Merced County 2004). Surface water quality within the Campus and University Community area is unknown.

4.8.2.6 Groundwater Resources

The Merced groundwater subbasin includes lands south of the Merced River between the San Joaquin River on the west and the crystalline basement rock of the Sierra Nevada foothills on the east. The subbasin boundary on the southern border follows westerly along the Madera-Merced County Line (Chowchilla River) (DWR Bulletin 118 2004). The boundary continues west along the northern boundary of the Chowchilla Water District and El Nido Irrigation District. The northern boundary of the subbasin is the Merced River.

The water-bearing units in the Merced subbasin consist of consolidated rocks and unconsolidated deposits. The consolidated rocks include the Ione formation, the Valley Springs formation, and the Mehrten formation. In the eastern part of the subbasin, the consolidated rocks generally yield small quantities of water except for the Mehrten formation, which is an important aquifer (DWR Bulletin 118 2004). The unconsolidated deposits were laid down during the Pliocene Age to present. From the oldest to youngest, these deposits include continental deposits, lacustrine and marsh deposits, older alluvium, younger alluvium and flood basin deposits. The continental deposits and older alluvium are the main water-yielding units in the unconsolidated deposits. The lacustrine and marsh deposits (which include the Corcoran, or 'E-'Clay), and the younger alluvium in most places probably yield moderate quantities of water to wells (DWR Bulletin 118 2004).

There are three groundwater bodies in the subbasin; an unconfined water body, a confined water body, and the water body in the consolidated rocks. The unconfined water body occurs in the unconsolidated deposits above and to the east of the Corcoran Clay, which underlies the western half of the subbasin at depths ranging between 50 to 200 feet (DWR 1981), except in the western and southern parts of the subbasin where the clay lenses occur and semi-confined conditions exist (DWR Bulletin 118 2004). The confined waterbodies occur in the unconsolidated deposits below the Corcoran Clay and extend downward to the base of fresh water. The water body in consolidated rocks occurs under both unconfined and confined conditions. The estimated average specific yield of this subbasin is 9.0 percent (based on DWR, San Joaquin District internal data and that of Davis 1959) (DWR Bulletin 118 2004). Specific yield is the ratio of water that is drained from the aquifer under the influence of gravity or pumping, while the aquifer remains fully saturated. This number is used to estimate how much water can be extracted from an aquifer without impacting the groundwater table.

Groundwater flow in the Merced subbasin is generally from northeast to southwest following the regional dip of the basement rock and sedimentary units, although groundwater pumping creates localized cones of depression and irrigation may cause mounding, complicating flow patterns and causing them to change over time (Merced Groundwater Basin Groundwater Management Plan 1997). There were two depressions shown south and southeast of the City of Merced during 1999 (DWR Bulletin 118 2004). The response of the aquifers to changes in pumping and irrigation is relatively rapid, and localized flow directions are affected by these changes.

Although a detailed budget was not available for this subbasin, an estimate of groundwater demand was calculated based on the 1990 normalized year and data on land and water use (DWR Bulletin 118 2004). A subsequent analysis was done by DWR to estimate overall applied water demands, agricultural groundwater pumpage, urban pumping demand, and other extraction data. Groundwater storage for this subbasin was calculated in 1995 using an estimated specific yield of 9.0 percent and water levels were

calculated by DWR and their cooperators. According to these calculations, the total storage capacity of this subbasin is estimated to be 30 million acre-feet (Merced County 2004).

Annual urban and agricultural extractions from the subbasin were estimated at 54,000 acre-feet and 492,000 acre-feet, respectively; other extractions equal approximately 9,000 acre-feet (DWR Bulletin 118 2004). MID supplements surface water supply with groundwater to satisfy irrigation demands. The total annual use of groundwater for irrigation purposes varies from year to year depending upon the availability of surface water (Merced Groundwater Basin Groundwater Management Plan 1997). Average annual agricultural water demands with the subbasin are projected to decrease by up to 12 percent over the next 40 years as a result of increased water use efficiency and a trend toward cultivation of lower water use crops (Merced Groundwater Basin Groundwater Management Plan 1997).

Recharge of the subbasin is estimated at 600,000 acre-feet (Merced County 2004). Natural recharge into the subbasin is estimated to be 47,000 acre-feet and there are approximately 243,000 acre-feet of applied water recharge into the subbasin. Values for artificial recharge and subsurface inflow have not been determined. Surface water diverted from the Merced River by MID is the major source of groundwater recharge, contributing 90 to 95 percent of the total groundwater recharge on the basin. Target diversions from the Merced River vary from a minimum of 506,000 to 585,000 acre-feet per year. Due to the hydrologic variability of the river, the average annual actual river diversions vary from 472,000 to 514,000 acre-feet per year (UC Merced 2002). In addition, deep percolation of groundwater used for irrigation returns a portion of the extracted groundwater to the aquifer.

Due to limited surface water supplies and the amount of pumping exceeding recharge, the Merced subbasin has been operating under overdraft conditions for many years (Merced Area Groundwater Pool Interests and California Department of Water Resources, *Merced Basin Hydrologic Modeling Objectives and Strategy*, Draft, February 2007). The historical groundwater elevation maps indicate declining water levels and existence of several groundwater depressions in the Merced Basin. Well hydrographs for the area provide further evidence of declining groundwater levels and depletion of groundwater storage. According to the Merced Water Supply Plan, the average annual overdraft is estimated to be about 20,000 acre-feet per year.

On average, the subbasin water level has declined nearly 30 feet from 1970 through 2000. The period from 1970 through 1978 showed steep declines totaling about 15 feet (DWR Bulletin 118 2004). The 10-year period from 1978 to 1988 saw stabilization and a rebound of about 10 feet. The period 1988 through 1995 again showed steep declines, bottoming out in 1996 with water levels rising from 1996 to 2000. Water level declines have been more severe in the eastern portion of the subbasin. Groundwater levels also fluctuate over time depending on precipitation, aquifer recharge, and pumping demands. Static

groundwater levels have stabilized within the past few years at approximately 70 feet below ground surface (bgs) in winter with recovery to approximately 50 feet bgs in early spring (Final Urban Water Management Plan (UWMP) 2005). Declining groundwater within the basin is a result of the groundwater extractions by all groundwater users in the area.

In addition to basin-wide impacts, there is localized overdraft in portions of the subbasin. It is not atypical in the San Joaquin Valley to have varying levels of water supply to different areas within a groundwater basin. This is the condition within the Merced groundwater subbasin where the absence of surface supplies on the east side of the valley has resulted in concentrated pumping to support irrigated agriculture (Merced Groundwater Basin Groundwater Management Plan 1997). Unless the amount of recharge is increased or the amount of pumping is reduced, eventually in areas of localized overdraft, groundwater levels may decline to such depths that farming the overlying lands, which rely primarily on groundwater, would not be economically viable (Merced Groundwater Basin Groundwater Management Plan 1997). Additionally, wells surrounding areas of localized overdraft may be adversely affected by lowering the water table and/or by water quality changes than can occur due to changes in hydraulic gradients.

The continued groundwater overdraft and the urban growth pressure in the region call for improved water resources management in the Merced Basin. While groundwater has provided the City of Merced a reliable water supply for many years, growth has motivated the City to evaluate its groundwater supply. In 1992, the City and MID entered into a Memorandum of Understanding (MOU) to develop a long-range water resources plan. The *Merced Water Supply Plan* was completed in 1995 and included goals for managing groundwater resources and to provide a high quality water supply. In September 2001, the *Merced Water Supply Update, Final Status Report* was prepared. Both of these reports identified the factors contributing to groundwater overdraft and recommended actions to restore the aquifer. The cooperating agencies of the Merced Water Supply Plan (City, MID, and UC Merced) have recognized the importance of maintaining sufficient water levels and have agreed on developing a strategy to maintain groundwater levels at 1999 levels (Final UWMP 2005).

The Merced Area Groundwater Pool Interests (MAGPI) entered into an MOU in an effort to support the implementation of a conjunctive use water management program through the DWR Integrated Storage Investigations Program (City of Merced 2005). Conjunctive use of groundwater and surface water in a groundwater basin typically occurs when the surface water supply to the basin varies from year to year and the basin demand is fairly constant. In the years of plentiful supply, surface water is utilized to recharge the groundwater aquifer. In effect, the groundwater basin is utilized as a storage reservoir and water is place in the reservoir during wet years and withdrawn from the reservoir during dry years. The MOU states that any water developed as a result of the conjunctive water management program will be

under the control of local agencies; the priority will be in-basin water needs with local agencies having jurisdiction over out-of-basin transfers.

In July 2008, the City and MID, in conjunction with MAGPI, completed an update to the 1997 Groundwater Management Plan for MGWB (hereinafter 2008 GWMP). This plan responds to AB 3030 which requires that local agencies work cooperatively to manage groundwater resources within their jurisdiction to ensure both its safe production and its quality. According to the 2008 GWMP, groundwater elevations throughout the basin have been declining with time, and since 1980, average groundwater levels in the MGWB have declined approximately 14 feet. The GWMP also notes the presence of several major cones of depressions within the basin centered on localized pumping centers in Chowchilla, Merced, and Livingston. Subsidence is not known to be occurring within the basin although the GWMP notes that it has been observed in one area around two wells. There is high variability in the quality of groundwater, especially groundwater in the upper water-bearing zone due to soil conditions, irrigation practices, and irrigation water quality. The 2008 GWMP notes that as of 2007, the groundwater basin is in a state of mild long-term groundwater level decline or overdraft (MAGPI 2008).

Water demand within the MGWB consists of agriculture, municipal, industrial, and environmental uses. Although agricultural demand within the MGWB is served by both surface and groundwater, based on the most recent water demand numbers, a total of 608,000 acre-feet/year of agricultural water demand (which includes 13,000 acre-feet/year within the MID service area and 595,000 acre-feet/year outside the MID service area) is met with groundwater. By comparison, municipal and industrial users pumped approximately 50,000 acre-feet of groundwater in 2007. Groundwater is not used for environmental uses which include water releases for fisheries. However, because additional surface water is being used for that purpose, environmental uses have resulted in a reduction in the availability of surface water for irrigation purposes, forcing MID to pump more groundwater from the MGWB (MAGPI 2008).

The increase in groundwater demand based on the City's 2004–2005 growth projections is anticipated in the 2008 GWMP and even though the yet to be adopted growth projections for the City are not included in the 2008 GWMP, the plan has been designed to manage and develop groundwater resources in a sustainable manner. As stated in the plan, "[t]he purpose of the GWMP is to identify and implement a number of actions using modern technology and sound science to preserve and/or increase the quantity of groundwater resources in the MGWB to ensure adequate groundwater resources for future generations." The GWMP is described as a living document and MAPGI notes that the progress in implementing the plan will be reviewed periodically with the current understanding of groundwater levels, quality, and trends. The GWMP includes four broad principles and Basin Management Goals (BMOs) to protect and maintain water quality; to protect and maintain water quantities and eliminate conditions of long-term overdraft; to protect and maintain groundwater recharge areas; and manage the

basin with local control. The GWMP contains 14 elements focused towards the attainment of these goals. Key elements that focus on addressing the existing overdraft and ensuring that groundwater levels are maintained include the following:

- Element 5, Mitigation of Groundwater Overdraft
- Element 6, Replenishment of Groundwater Extracted by Producers
- Element 7, Monitoring and Controlling Groundwater Levels, Quality, and Storage
- Element 8, Facilitating Conjunctive Use Operations
- Element 10, Construction and Operation of Recharge, Storage, Conservation, Water Recycling, and Extraction Projects
- Element 12, Review of Land Use Plans and Coordination with Land Use Planning Agencies
- Element 13, Merced Groundwater Basin Groundwater Monitoring Program

The plan also outlines how these elements would be implemented and identifies the metrics that would be used to evaluate the effectiveness of implementation. In view of the fact that all local water purveyors have come together to address the issue of overdraft and to plan the supply of water in a sustainable manner, it is anticipated that all involved entities would minimize the increase in groundwater extraction by minimizing water use through conservation and water recycling. Regional agencies such as MAGPI and MID will enhance conjunctive use operations by further improving recharge during years when surface water is available for this purpose, including in-lieu recharge, percolation of surface water in recharge basins, recharge through injection wells, and direct recharge through creeks. MAGPI will also pursue cooperative arrangements with state and local agencies for purposes of expanding the basin's conjunctive use capabilities (MAGPI 2008).

With respect to the effect of global climate change on groundwater basins in the state, reports published by the Department of Water Resources suggest that although some climatic changes may favorably affect groundwater basins by improving recharge, other changes and processes set in motion by global climate change may result in reduced recharge of groundwater basins. The exact impacts of this phenomenon on the MGWB cannot be predicted at this time. For more information on potential effects on groundwater basins in California, please see **Section 4.16, Global Climate Change**.

4.8.2.7 Groundwater Quality

The Merced subbasin groundwater is generally calcium-magnesium bicarbonate at the basin interior, sodium bicarbonate to the west, and calcium-sodium chloride waters exist at the southwest corner of the

basin (DWR 2004). Total dissolved solids (TDS) values range from 100 to 3,600 milligram per liter (mg/L), with a typical range of 200 to 400 mg/L. The Department of Health Services (DHS), who monitors Title 22 water quality standards, reports the TDS values in 46 wells in the Merced subbasin ranging from 150 to 424 mg/L, with an average value of 231 mg/L. For 10 wells, EC values range from 260 to 410 microsiemens per centimeter (µmhos/cm), with an average value of 291 µmhos/cm (DWR 2004). There are also localized impairments within the Merced subbasin. There are areas that are high in hardness, iron, nitrate, and chloride (DWR 2004).

4.8.2.8 Water Supply

2005 Merced Urban Water Management Plan

The 2005 Merced Urban Water Management Plan (UWMP) is required by the Urban Water Management Planning Act (California Water Code, Division 6, Part 2.6, Sections 10610 through 10657) and serves as the long-term water supply plan for the City of Merced (City of Merced 2005). According to the 2005 UWMP, currently the City of Merced along with the county residents relies on groundwater as their primary source of potable water. The City is the only water purveyor for the water users within the City limits. MID provides irrigation water to Golden Valley High School, agricultural users, and has plans to phase in water service to the City parks.

The City of Merced provides water to approximately 73,600 people within the City's boundaries through approximately 19,000 active service connections (City of Merced 2005). The City's 2005 UWMP projects that there would be an increase in water use from 31,010 afy in 2005 to 56,200 afy by 2025 (City of Merced 2005). Nineteen active production wells, with a combined capacity of 49,500 gallons per minute, make up the City's total water supply. Well No. 17 is a City-owned well located on the UC Merced Phase 1.1 Campus on land deeded by the University to the City. This well supplies 90 percent of its water to the campus and the other 10 percent to the rest of the City (City of Merced 2005). The pipeline connecting the on-campus well to the City's distribution system is located within Bellevue Road and G Street.

As discussed above, recent studies have shown that the groundwater levels are dropping (City of Merced 2005). This is due to the urban expansion with an increasing population growth and the increasing demands of groundwater being used by farmers who used to rely on surface water for irrigation.

Existing Water Use on the Project Site

The proposed project site is comprised of the existing UC Merced Phase 1.1 Campus located on the site of a former golf course, and two agricultural properties, the Flying M Ranch and LWH Farms, LLC (also known as Hunt Farms). The water supply includes groundwater wells for on-site campus uses, on-site

agricultural and domestic uses as well as MID-owned irrigation canals that deliver surface water from Lake Yosemite and the Merced River. There is no information currently about the domestic water use for the homes on the Hunt Farm and due to the relatively small water use by the ranch homes, is not included in this analysis.

Table 4.8-1, Existing Water Use on Project Site, provides a breakdown of the existing water uses[1] on the project site. As noted above, Phase 1.1 Campus is supplied water by the City of Merced from an on-site well. The campus' current annual water use is about 158 acre-feet. Both surface and groundwater are used within the University Community. Groundwater extracted from on-site wells accounts for approximately 3,054 acre-feet and surface water delivered by MID canals accounts for approximately 2,285 to 5,630 acre-feet of water used in a year within the University Community area (Merced County 2004). Agricultural water demands can switch from surface water to groundwater use based on the type of year, whether drought or normal. During normal years, agricultural water uses rely more on surface water, and during the drought years, water demands are supplied more from the groundwater. Groundwater demands during drought years when surface water supplies from the canals are restricted can account for approximately 3,054 acre-feet (Merced County 2004).

Table 4.8-1
Existing Water Use on Project Site (acre-feet/year)

Property	Use	Irrigated Acres	Groundwater Used	Surface Water used	Total Water Use
UC Merced Campus[1]	Potable and non-potable	N/A	158	0	158
Former Flying M Ranch[2]	Pasture	500	754	346	946
LWH Farms[2]	Farmland	860		1,939 – 5,284	1,939 – 5,284
Total			912	2,285 – 5,630	3,043 – 6,388

Source: Merced County 2004; UC Merced 2008.
1 Based on existing metered water uses on campus
2 Based on data reported in 2004 UCP EIR

1 Although the data reported in this table for the former Flying M Ranch and LWH Farms are from 2004, these are considered representative of existing conditions because the land uses and agricultural practices on these properties have not changed since 2004.

Existing UC Merced Campus

The campus currently uses about 158 acre-feet per year for irrigation and domestic uses. The campus receives all of its water supply from the groundwater aquifer and no supplements from the surface water supplies. The groundwater well is located on the Phase 1.1 Campus and has a capacity to produce approximately 1,790 acre-feet per year of potable water. A second well associated with the former golf course that occupied the Phase 1.1 Campus site before it was developed is also located on the campus.

Flying M Ranch

The Flying M Ranch, which consists of land immediately south of the Phase 1.1 Campus and would be developed with facilities associated with the southern portion of the Campus and Community North, currently operates two groundwater wells used for irrigation purposes. The wells have the capability of extracting 1,350 to 1,860 gallons per minute (gpm) using a 50 horsepower pump (hp). There is no information available regarding the depth to water in this part of the project site. The wells are only used during the irrigation months and extracted about 754 acre-feet of groundwater in 2000 (Merced County 2004). The UCP EIR also noted that the ranch reported using only 1,100 acre-feet of water from both the surface water sources and the groundwater sources. According to MID, the typical application rates for the ranch are between 1,918 acre-feet and 2,192 acre-feet of combined surface and groundwater (Merced County 2004).

LWH Farms

On the LWH Farms, LLC, property, there are five groundwater wells used for irrigation that range from 140 to 500 feet in depth. The wells are used only in years of drought according to the 2004 UCP EIR. The wells are capable of extracting groundwater at a rate between 514 and 1,642 gpm using 15-hp and 50-hp pumps. There are also three domestic wells located on this property. Only one of the domestic wells is used and the other two serve as backup wells (Merced County 2004). The depths of the domestic wells are unknown, but all three wells have the capability of extracting approximately 100 gpm. The depth to groundwater on the LWH Farm is approximately 42 feet bgs. The groundwater drawdown effects from the agricultural wells or the domestic wells and one another are unknown.

According to the 2004 UCP EIR, during most years, surface water is the only source used for irrigation purposes of the croplands. According to MID, the average use of surface water for the irrigation on the LWH Farms property ranged from 1,939 acre-feet in 1996 to 5,280 acre-feet in 1997 (Merced County 2004).

4.8.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.8.3.1 Federal Regulations

The California SWRCB is the state agency with the primary responsibility for implementation of state and federally established regulations relating to water resource issues. Typically, all regulatory requirements are implemented by the SWRCB through regional boards established throughout the state.

Clean Water Act

In 1972, the Federal Water Pollution Control Act—also known as and hereafter referred to as the Clean Water Act (CWA)—was amended to require NPDES permits for discharge of pollutants into the "waters of the United States" that include oceans, bays, rivers, streams, lakes, ponds, and wetlands from any point source. In 1987, the CWA was amended to require that the US EPA establish regulations for permitting under the NPDES permit program of municipal and industrial stormwater discharges. The EPA published final regulations regarding stormwater discharges on November 16, 1990. The regulations require that municipal separate storm sewer system (MS4) discharges to surface waters be regulated by an NPDES permit.

In addition, the CWA requires the states to adopt water quality standards for water bodies and have those standards approved by the US EPA. Water quality standards consist of designated beneficial uses—e.g., wildlife habitat, agricultural supply, fishing, etc.—for a particular water body, along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents—such as lead, suspended sediment, and fecal coliform bacteria—or narrative statements that represent the quality of water that supports a particular use. Because California has not established a complete list of acceptable water quality criteria, the US EPA established numeric water quality criteria for certain toxic constituents in the form of the California Toxics Rule (40 CFR 131.38).

Water bodies not meeting water quality standards are deemed "impaired" and, under CWA Section 303(d), are placed on a list of impaired waters for which a TMDL must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL is allocated among current and future pollutant sources to the water body.

The San Joaquin River from Mud Slough to the Merced River is listed on the 303(d) list as being impaired for boron, DDT, electrical conductivity, Group A Pesticides, mercury, selenium, and unknown toxicities (SWRCB 2002).

Clean Water Act Dredge and Fill Permits and Water Quality Certifications

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Project proponents must obtain a permit from the US Army Corps of Engineers (USACE) for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Before any actions that may affect surface waters are carried out, a delineation of jurisdictional waters of the United States must be completed following USACE protocols, in order to determine whether the project area encompasses wetlands or other waters of the United States that qualify for CWA protection.

Wetlands are a subcategory of waters of the United States and are defined for regulatory purposes as areas "inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 40 CFR 230.3).

Section 404 permits may be issued only for the "least environmentally damaging practicable alternative." That is, authorization of a proposed discharge is prohibited if there is a practicable alternative that would have less adverse wetland impacts and lacks other significant adverse consequences.

Under CWA Section 401, applicants for a federal license or permit such as a Section 404 permit must obtain certification from the state that the activity will not adversely affect water quality. The Section 401 certification or waiver for the Proposed Action is under the jurisdiction of the Central Valley RWQCB (Region 5 Fresno).

CWA Permits for Discharge to Surface Waters

CWA Section 401 and 402 contain requirements for discharges to surface waters through the NPDES program, administered by the EPA. In California, SWRCB is authorized by the EPA to oversee the NPDES program through the Regional Water Quality Control Boards (RWQCBs) (see related discussion under "Porter-Cologne Water Quality Control Act" below). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The permit contains requirements of allowable concentrations of contaminates contained in the discharge.

General Construction Permit

Pursuant to CWA Section 402(p), which requires regulations for permitting of certain stormwater discharges, the SWRCB has issued a statewide general NPDES permit for stormwater discharges from

construction sites ([NPDES No. CAS000002], per California Water Resources Control Board Resolution No. 2001-046.

According to NPDES regulations, effective March 2003, discharges of stormwater from construction sites in California with a disturbed area of 1 acre or more, are required either to obtain individual NPDES permits for stormwater discharges or to be covered by the statewide Construction General Permit. Coverage under the Construction General Permit is accomplished by completing and filing a Notice of Intent with the SWRCB. Each applicant under the Construction General Permit must ensure that a Stormwater Pollution Prevention Plan (SWPPP) is prepared prior to grading and is implemented during construction. The primary objective of the SWPPP is to identify, construct, implement, and maintain Best Management Practices (BMPs) to reduce or eliminate pollutants in stormwater discharges and in authorized non-stormwater discharges from the construction site during construction. Permittees are further required to conduct monitoring and reporting to ensure that BMPs are correctly implemented and are effective in controlling the discharge of pollutants. Projects constructed in California Department of Transportation (Caltrans) facilities or rights-of-way must comply with the requirements of Caltrans' statewide NPDES permit, which has requirements similar to those of the construction general permit.

Dewatering Activities

While small amounts of construction-related dewatering are covered under the Construction General Permit, the RWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and would likely apply to the proposed project, if construction required dewatering in greater quantities than that allowed by the Construction General Permit and discharged the effluent to surface waters. Permit conditions for the discharge of these types of wastewaters to surface water are specified in Waste Discharge Requirements General Order for Dewatering and Other Low-Threat Discharges to Surface Waters (Order No. 5-00-175, NPDES No. CAG995001) (Merced County 2004). The general permit also specifies the standards for testing, monitoring, and reporting, receiving water limitations and discharge prohibitions.

The General Dewatering Permit may be applicable to UC Merced, the University Community, and its contractors where excavation such as trenching for pipeline and other construction activities may drop below the water table.

Municipal Stormwater Permit

The 1987 amendments to the CWA directed the EPA to implement stormwater programs into two phases. Phase I, addresses large and medium populations (250,000 or more, and 100,000-250,000). Phase II

includes all other discharges defined by the EPA that are not included in Phase I. Under the statewide permit, as a Phase II community, the County will need to implement at least six control programs, including public education and outreach, public participation and involvement, illicit discharge deduction and elimination, construction site runoff control, post-construction runoff control, post-construction runoff control, and pollution prevention and good housekeeping. These requirements will include measurable goals and descriptions so the County of Merced will be able to evaluate the success of each measure. The Campus has not yet been designated by the CVRWQCB as a Phase II community.

Safe Drinking Water Act

The 1986 federal Safe Drinking Water Act requires each state to develop a wellhead protection plan to describe how areas around wells will be protected from potential contamination. A major element of a wellhead protection program is the determination of protection zones around public supply wellheads. Within these zones, potential protection measures could include limitations on land uses to preclude industrial or agricultural uses with the potential to result in spills of chemicals or overuse of fertilizers and other chemicals.

Federal Flood Insurance Program

Congress responded to increasing costs of disaster relief by passing the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. These acts reduce the need for large publicly funded flood control structures and disaster relief by restricting development on floodplains. FEMA administers the National Flood Insurance Program (NFIP) and issues FIRM for the areas participating in the program. These maps delineate flood hazard zones. The Campus and University Community are located in Zone X, which is defined by FEMA as being outside the floodplain with a 0.2 percent annual chance of flooding (FEMA 2006). The existing campus, future extension of the campus, and the University Community are not within the 100-year flood zone as defined by FEMA.

Executive Order 11988

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding to

- avoid incompatible floodplain development,
- be consistent with the standards and criteria of the NFIP, and
- restore and preserve natural and beneficial floodplain values.

This order would apply to the UC Merced and University Community if construction related to the CWA Section 404 permit falls under any of the bulleted categories listed above.

4.8.3.2 State Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) provides the statutory authority for SWRCB and the RWQCBs to regulate water quality and was amended in 1972 to extend the federal CWA authority to these agencies (see Clean Water Act above). The Porter-Cologne Act established the SWRCB and divided the state into nine regions, each overseen by a RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the State's surface and groundwater supplies, but much of the daily implementation of water quality regulations is carried out by the nine RWQCBs.

Basin Plan

The Porter-Cologne Act provides for the development and periodic review of water quality control plans (also known as basin plans). The basin plan for the Sacramento River and San Joaquin River Basin (Central Valley RWQCB (OCT 2007), as amended designates beneficial uses and water quality objectives for water bodies in the region. The San Joaquin Basin Plan identifies beneficial uses for the area's surface and groundwater, as shown in Table 3H-1 (Central Valley RWQCB 2007). The Central Valley Basin Plan lists beneficial uses of major water bodies within this region, including the reaches of San Joaquin River that could be affected (**Table 4.8-2, Beneficial Uses Identified in Basin Plan for Potential Receiving Waters and Groundwater Basins in the Project Area**). The groundwater basin that could receive storm water from the future detention basins, designed for groundwater recharge, is the Merced groundwater subbasin.

Water Quality Objectives

The CVRWQCB has set water quality objectives for all surface waters in its region, including San Joaquin River. Specific objectives are provided for the larger water bodies within the region as well as general objectives for surface and groundwater. In general, narrative objectives require that degradation of water quality not occur because of increases in pollutant loads that will impact the beneficial uses of a water body. Water quality criteria apply within receiving waters and do not apply directly to runoff; therefore, water quality criteria from the San Joaquin Basin Plan are used as benchmarks for comparison in the quantitative assessments and are also examined in the qualitative assessments in the discussion of project impacts below. Basin plans are primarily implemented by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met.

The closest receiving water body to the proposed project that has water quality objectives set by the CVRWQCB is the San Joaquin River. The San Joaquin River has water quality objectives for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. Specific objectives for concentrations of chemical constituents are applied to bodies of water based on their designated beneficial uses (CVRWQCB 2007). Water quality objectives applicable to all groundwaters have been set for bacteria, chemical constituents, radioactivity, tastes and odors, and toxicity (CVRWQCB 2007). One method the CVRWQCB uses to implement Basin Plan criteria is through the issuance of waste discharge requirements (WDRs). WDRs are issued to any entity that discharges point-source effluent to a surface water body. The WDR permit also serves as a federally required NPDES permit (under the federal CWA) and incorporates the requirements of other applicable regulations.

Potential receiving waters for the project consist of Bear Creek, Cottonwood Creek, Fahrens Creek, and Black Rascal Creek (via the Rascal Creek diversion channel). The last three creeks are tributaries to Bear Creek that ultimately flows in to the San Joaquin River and its downstream tributaries. **Table 4.8-3, Basin Plan Surface Water Quality Objectives**, presents the San Joaquin Basin Plan's water quality objectives for the surface waters that are potentially relevant to the Proposed Action. The groundwater quality objectives stipulate that bacteria used in domestic or municipal water supplies for the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml (CRWQCB 2007). Groundwater shall not contain constituents in concentration that adversely affect beneficial uses. At a minimum, groundwaters designed for use of domestic or municipal supply shall not contain concentrations of chemical constituent levels that exceed the maximum concentration levels (MCLs) specified in the California Code of Regulations which are incorporated into the basin Plan for the Sacramento- San Joaquin River Basins.

Table 4.8-2
Beneficial Uses Identified in Basin Plan for Potential Receiving Waters and Groundwater Basins in the Project Area [1]

	MUN	AGR		IND			Recreation			Freshwater Habitat		Migration		Spawning		Wild	NAV
							REC 1		REC 2								
		Irrigation	Stock watering	Process	Service Supply	Power	Contact	Canoeing and Rafting	Other noncontact	Warm	Cold	Warm	Cold	Warm	Cold	Wildlife habitat	Navigation
Surface Water																	
San Joaquin River (Sac Dam to the mouth of the Merced River)	P	E	E	E			E	E	E	E		E	E	E	P	E	
Yosemite Lake							E		E	E	E					E	
Groundwater Basin																	
Merced	P*	P*	P*	P*	P*												

Notes
1 Only uses allowed in project area; see Basin Plan for other categories of beneficial uses.
P = Potential Beneficial Use.
E = Existing Beneficial Use.
P= Unless otherwise designated by the Regional Water Board, all ground waters in the Region are considered as suitable or potentially suitable, at a minimum, for municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO) (RWQCB 2007).*
Source: Central Valley RWQCB 2007.

Table 4.8-3
Basin Plan Surface Water Quality Objectives (mg/L)

Surface Water Body Maximum Concentration (mg/L)	Arsenic	Barium	Boron	Cadmium	Copper	Cyanide	Iron
San Joaquin River	0.01	0.1	2.0 (15 Mar through 15 Sept)	0.00022	0.0056	0.01	0.30
	Manganese	**Molybdenum**	**Selenium**	**Silver**	**Zinc**		
San Joaquin River	0.05	0.015	0.012	0.01	0.1		

Sources: Central Valley RWQCB 2007.

Municipal Separate Storm Sewer System Permit

Municipal Separate Storm Water Systems (MS4s) are any conveyance or system of conveyances that are owned or operated by a state or local government entity and are designed for collecting and conveying stormwater that is not part of a Publicly Owned Treatment Works (i.e., not a combined sewer). MS4 regulations apply to MS4s serving populations of 100,000 or more, although some MS4s with populations under 100,000 can be designated for permit coverage.

The RWQCBs issue MS4 permits that regulate stormwater discharges in the vicinity and downstream of the proposed project area. The permits require the permittee to establish controls to the maximum extent practicable and effectively prohibit non-stormwater discharges to the MS4. The MS4 permits detail requirements for new development and significant redevelopment projects, and includes specific sizing criteria for treatment BMPs.

California Fish and Game Code Sections 1600–1616 (Lake- or Streambed Alteration Agreement Program)

Under Sections 1600–1616 of the California Fish and Game Code, the California Department of Fish and Game (CDFG) regulates projects that affect the flow, channel, or banks of rivers, streams, and lakes. Section 1602 requires public agencies and private individuals to notify and enter into a streambed or lakebed alteration agreement with CDFG before beginning construction of a project that will affect a channel or a water body within CDFG jurisdiction.

4.8.3.3 Local Plans and Policies

UC Merced 2009 Long Range Development Plan

The UC Merced 2009 Long Range Development Plan (LRDP) contains policies that are intended to serve as a guide to future development of the UC Merced Campus. Policies that are applicable to hydrology and water quality are listed below.

Sustainability

SUST-1: Adhere to principles of sustainable environmental stewardship, conservation and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations and management.

SUST-2: Design campus facilities to achieve a minimum of US Green Building Council LEED Gold certification at a minimum, when employing all campus base credits. Establish a minimum of 20-25 LEED campus base credits by creating and implementing planning and design standards for all campus facilities and site development. Temporary facilities (less than fifteen years life expectancy) shall strive for LEED Silver equivalence, unless recommended for exemption from policy by the Campus Physical Planning Committee and approved by the Chancellor.

SUST-5: Design buildings to utilize exterior shading to reduce building cooling loads, and utilize circulation systems such as arcades, loggias, or porches to protect major entries to ground floor functions, reducing the need for environmentally conditioned space in areas of high traffic.

SUST-8: Explore the feasibility of achieving water neutrality by determining UC Merced's "water footprint" (i.e., consumptive use of rainwater [green water], consumptive use of water withdrawn from groundwater or surface water [blue water] and pollution of water [grey water]); Establish water footprint reduction targets for UC Merced and employ mechanisms to offset the environmental and social impacts of residual water footprints, such as, employing state of the art technologies, education, modeling new and cost-effective approaches in design and product selection.

SUST-9: Minimize consumption of potable water resources through the design of landscapes that minimize the use of irrigation water after the plants' initial growing phase, providing for use of recycled water for all irrigation. Explore feasibility of seasonal use of irrigation water from MID.

Services

SER-5: Provide for the short-and long-term collection and treatment of campus wastewater, initially by the City of Merced's Wastewater Treatment Facility, with the possible long-term addition of a recycled water treatment facility either on the campus or in the University Community, which will allow the campus to augment its other water supplies and create a source for recycled and industrial water, biomass energy and compost.

SER-6: Minimize water use by permitting spray irrigation only in large turf areas, primarily used for formally landscaped, organized recreation or athletic fields. Irrigation systems will be designed to utilize smart controls, such as using information gathered from local weather stations, and tailored to soil types and plant types, adjusting water distribution on a daily basis as needed, thus minimizing runoff.

University Community Plan

The following University Community Plan (UCP) policies are applicable to the hydrology and water quality within the University Community area (**Table 4.8-4, Relevant UCP Policies**).

Table 4.8-4
Relevant UCP Policies

IW 1.1	Ensure the provision of potable water infrastructure (wells and storage) to provide water supply to meet community needs.
IW 1.2	Require that an adequate water supply be demonstrated before approving new development.
IW 1.4	Ensure provision of water systems that match appropriate water quality to water use requirements.
IW 1.9	Ensure the provision of adequate wastewater conveyance to accommodate planned development.
IW 1.14	Ensure that the stormwater conveyance and storage system is designed consistent with Merced County standards.
IW 4.2	Require multiple use stormwater detention basins, including uses such as stormwater detention, water quality enhancement, recreation, wetland habitat, and species conservation.

IW 4.3	Require the creation of recharge basins for stormwater recharge to the aquifer system, where feasible.
IW 4.6	Require the inclusion of water reuse infrastructure within building systems and landscape irrigation systems, except where inclusion of such infrastructure is irrelevant or infeasible.
IW 4.7	Ensure that where recreational uses are included in multiple use detention basins they are designed to avoid inundation of playfields by more than 1 foot of water during the 10-year storm event, consistent with Merced County standards as illustrated in Figures 14 and 15 of the UCP EIR Merced County 2004.
IW 4.8	Ensure that the design of multiple use detention basins protects public safety by minimizing hazards.
IW 5.1	Implement an active water conservation program in the University Community to reduce future water demand to the extent allowed by law by establishing building requirements for new construction, providing educational information through local media sources, and establishing effective rate changes to encourage conservation.
IW 5.2	Require the use of best available technologies (BAT) for water conservation, including, but not limited to water-conserving toilets, showerheads, faucets, and water-conserving irrigation systems.
IW 5.4	Encourage the use of recycled water by industrial, commercial, recreational, and agricultural users through the use of incentives (i.e., differential pricing, uninterrupted supply).
IW 5.5	Encourage the construction of a distribution system for recycled water use that makes recycled water accessible to each developed lot in the University Community.
IW 5.6	Ensure the provision of recycled water at the appropriate quality required for a specific reuse opportunity.
IW 5.7	Ensure the construction of stormwater capture, storage and conveyance systems that allow for the productive use of runoff and that decrease demand for groundwater resources.
IW 5.8	Ensure the provision of captured stormwater runoff for irrigation of public facilities and/or recharge to aquifer on site to offset use of potable water.
IW 5.9	Require that grading plans be designed to reduce runoff by capturing rain waters on site and that avoid "crowning" techniques that force rain waters into community drainage facilities.
IW 8.1	Ensure that groundwater extraction does not result in localized groundwater drawdown that will have significant adverse effects on existing or planned neighboring uses.
IW 8.2	Prohibit direct discharge of treated wastewater to surface waters.
IW 8.3	Ensure that wastewater collection and treatment system(s) are designed and constructed to protect groundwater and surface water from contamination by wastewater.
IW 8.4	Ensure that wastewater treatment levels meet standards for intended reuse or discharge point.
IW 8.4	Ensure that wastewater treatment levels meet standards for intended reuse or discharge point.
IW 8.5	Prohibit cross-connection of sanitary sewer and storm drain system.
IW 8.6	Ensure that stormwater detention and groundwater recharge facilities are designed to avoid adverse impacts to groundwater.
IW 8.7	Ensure that stormwater conveyance and storage facilities are designed and constructed to ensure no net degradation in stormwater quality.
IW 8.8	Ensure that water-related infrastructure is designed to support Merced Irrigation District, local and/or regional groundwater recharge program(s).
IW 8.9	Require the application of Best Management Practices (BMPs) for stormwater quality.

IW 8.10	Encourage sensitivity to water pollution through educational and outreach programs aimed at the residential landowner.
IW 9.2	Encourage the location of stormwater detention basins near existing or re-created stream corridors.
IW 9.3	Encourage the design of stormwater conveyance facilities that retain or re-construct portions of natural drainages to maintain stream velocities at or near pre-developed conditions.
IW 9.4	Encourage the preservation of natural floodplains in the design of water-related infrastructure in order to reduce infrastructure construction costs and potential flood hazards to structures.
IW 9.5	Encourage the design of stormwater storage facilities that maximize opportunities for intermittent shallow water impoundment during the wet season.
IW 9.7	Prohibit development, grading or structural improvements within the 100-year floodplain, except as consistent with Merced County standards. Recreational activities may be permitted within the floodplain.
IW 10.1	Ensure that long-term plans for the design and construction of water-related infrastructure include flexibility that allows for changes in technology, funding, and/or management.
IW 10.2	Ensure that water systems are designed to anticipate changes in the demand for water of different quality parameters
IW 11.1	Require that the University Community water supply infrastructure system is consistent with regional water supply plans, particularly the Merced Water Supply Plan.
IW 11.2	Ensure that groundwater wells are sited consistent with City of Merced operational strategy.
IW 11.3	Ensure that the University Community water supply strategy conforms to existing protocol for groundwater withdrawal and storage established by Merced Irrigation District and the City of Merced, and reflected in the Merced Water Supply Plan.
IW 11.4	Ensure that the groundwater well distribution conforms to the City of Merced well grid system.
IW 11.10	Ensure that the design of proposed stormwater conveyance and storage facilities is compatible with existing capacity restrictions of MID facilities.
IW 11.11	Ensure that stormwater systems that discharge to MID facilities are designed consistent with MID requirements and construction standards.
IW 12.3	Require that facilities to detain stormwater runoff are designed and constructed so that no adverse flooding impacts are created downstream.
IW 12.4	Ensure that new development provides stormwater detention sufficient to limit outflow to a level consistent with downstream limitations.
IW 12.6	Ensure that groundwater extraction does not result in localized groundwater draw-down that will have significant adverse effects on existing or planned neighboring uses.
IW 12.7	Ensure that water-related infrastructure is designed to support local and/or regional groundwater recharge program(s).
IW 13.3	Require the implementation of monitoring programs to ensure water systems consistently comply with applicable potable water regulations.
IW 13.6	Require compliance with the National Pollutant Discharge Elimination System Phase 2 program and monitoring of stormwater.
IW 13.7	Evaluate groundwater recharge capabilities every five years and ensure adequate long-term protection of groundwater resources.

S 2.1	Work with MID to ensure that the structural integrity of the on-site irrigation canals is adequate to support projected water flows within the canals. As part of the formulation of Specific Plans, a qualified engineer shall perform structural stability investigations, and make recommendations regarding reinforcement options consistent with MID requirements. This shall be completed in concert with the stormwater drainage system design.
S 2.2	Development in the University Community North and South should not occur within an agreed-upon distance (County and Merced Irrigation District to decide) from the toe of the canal's levees in order to protect the structural integrity of the canal system. MID currently maintains a 150-foot-wide easement along the Le Grand Canal, a 100-foot-wide easement along the Fairfield Canal, and a 60-foot-wide easement along the Fairfield Lateral "A" and the Dunn Lateral. Use of the canals and public safety shall be protected in accordance with policies LU 9.7 and LU 9.9.

Merced County General Plan

Goal 2 Soil, water, air, mineral, energy, and historical resources are properly managed.

Objective 2b Surface and groundwater resources are protected from contamination, evaporation and inefficient use.

Policies

(5) Ensure that land uses developed on or near water resources will not impair the quality or productive capacity of these resources.

(6) Develop methods to prevent the depletion of groundwater resources and promote the conservation and reuse of water should be encouraged

(11) Promote the development of the community drainage system to manage, control and reduce degradation of wetlands and other riparian areas from urban runoff.

Merced County Drainage Design Standards

As a condition of approval, any new development within the University Community will be required to be designed so that natural drainage channels can pass the 100-year, 24-hour storm. The drainage design standards also require that increased runoff due to new development not result in an increase in natural drainage flow beyond pre-development 100-year, 24-hour storm flows. Drainage collection and transmission infrastructure should be designed to pass the 5-year, 24-hour storm. The drainage standards assure that detention facilities are designed to detain the 10-year, 24-hour storm event. The stormwater drainage system for any proposed development within the County of Merced shall be designed in

accordance with the Merced County Department of Public Work Storm Drainage Design Manual (Merced County 2004).

Merced County Code Chapter 9.28

This code regulates the location, construction, maintenance, and abandonment of water wells, monitoring wells, and cathodic protection wells. It requires permits from the County Health Officer for all instructions involving wells and establishes standards for the construction, repair, and abandonment or destruction of wells.

Merced Code Chapter 16.40

Chapter 16.40 of the County Code addresses the conservation of water and preservation of water quality through the use of drought tolerant plant material and retention of natural landscaping.

City of Merced General Plan

The City of Merced Vision 2015 General Plan contains the policies listed in **Table 4.8-5, City of Merced Vision 2015 General Plan Goals, Policies and Implementing Actions,** below with respect to hydrology, water quality, and groundwater. The City general plan policies would be applicable to the development of the University Community in the event that the community is annexed to the City.

Table 4.8-5
City of Merced Vision 2015 General Plan
Goals, Policies, and Implementing Actions

Policy OS-1.2	Preserve and enhance creeks in their natural state throughout the planning area.
Implementing Action OS-1.2.c	Encourage alternatives to concrete channeling of existing creeks and streams as part of any flood control project and support more natural flood control methods
Policy OS-1.5	Preserve and enhance water quality.
Implementing Action OS-1.5.a	Utilize storm water retention basins and other "Best Management Practices" to improve the quality of stormwater discharged into the region's natural surface water system.
Policy OS-4.1	Preserve open space areas, which are necessary to maintaining public health and safety.
Implementing Action OS-4.1.a	Continue enforcement of the City's Flood Damage Prevention Ordinance (MMC 14.48) to discourage construction in high.
Policy OS-5.2	Protect soil resources from the erosive forces of wind and water.
Implementing Action OS-5.2.c	Maintain adequate vegetation along the banks of urban streams and storm water drainage channels.
Policy S-2.3	Restrict urban development in all areas with potential ground failure characteristics

Implementing Action S-2.3.b	Retain a high level of groundwater supply in order to reduce the possibility of land subsidence, including the initiation of an education program to discourage excessive, inefficient uses of water.
Goal S-3	A city free from other than street flooding
Policy S-3.1	Endeavor to remove most of the existing City, and the vast majority of the SUDP, from the 100-year floodplain.
Implementing Action S-3.1a	Work on the development and implementation of a funding plan to provide for the City's share of the Merced Streams Project. Consider basing assessments on those areas, which would benefit from removal from the 100-year flood and/or Lake Yosemite's inundation area.
Policy S-3.2	Maintain essential City services in the event of flooding or dam failure
Implementing Action S-3.2.a	Continue to build all pump stations (both sewer and water) entryways at 1 foot above the 100-year flood elevation and consider additional standards to address flooding due to dam failure
Implementing Action S-3.2b	Continue the "flood-proofing" of high-value or important City infrastructure, such as lift stations and signal control functions, as required by the City's Flood Damage Prevention Ordinance.
Goal P-3	An adequate water source, distribution and treatment infrastructure system in Merced.
Policy P-3.1	Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.
Policy P-3.2	In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.
Implementing Action 3.2.c	Explore the use of MID water resources for applications that do not require treated water to reduce demand on the regional groundwater supplies and reduce costs of water treatment.
Implementing Action 3.2.d	Cooperate with MID and the County in development of groundwater recharge facilities as called for in the Merced Water Supply Plan.
Implementing Action 3.2.e	Obtain, purchase or preserve rights to open space such as transitioning agricultural lands for proposed major treatment plants, groundwater recharge and storage facilities.
Goal P-5	An adequate storm drainage collection and disposal system in Merced
Policy P-5.1	Provide effective storm drainage facilities for future development
Implementing Action P-5.1.a	Continue to implement, along with MID and Merced County, the *Merced County Critical Area Flooding Drainage Plan,* within the Merced urban area under the overall jurisdiction of the Merced County Flood Control District (MCFCD)
Implementing Action P-5.1.d	Continue to require all development to comply with the Merced County Critical Area Flooding and Drainage Plan and any subsequent updates.
Implementing Action P-5.1.e	Installation of facilities necessary to provide services to development projects will be based on the full buildout scenario.
Policy P-5.2	Integrate drainage facilities with bike paths, sidewalks, recreation facilities, agricultural activities, groundwater recharge, and landscaping.
Implementing Action P-5.2.a	Provide drainage channels in transportation or canal easement areas as much as feasible.
Implementing Action P-5.2.b	Stormwater detention and groundwater recharge ponds should be designed to appear natural in character as much as feasible and dual use of recreation facilities should be promoted where conditions are compatible.

4.8.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

The President's Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under National Environmental Policy Act (NEPA) is summarized in **Section 4.0.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidance regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment, which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this Draft EIS/EIR, impacts related to hydrology and water quality would be significant if implementation of the Proposed Action or its alternatives would

- violate any water quality standards or waste discharge requirements;
- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of the pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff;
- otherwise substantially degrade water quality;
- place housing or structures within a 100-year floodplain or place structures that would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- inundation by seiche, tsunami, or mudflow.

4.8.4.1 Issues Not Discussed Further

The Campus and the University Community are not located within a 100-year flood hazard area as mapped by FEMA (FEMA Parcel Number 06047C0435F 2006). In addition, structures that would impede or redirect flows would not be placed within existing drainage channels, as these areas would be preserved as open space or would encompass proposed detention basins (Merced County 2004). Therefore, no impact would occur.

A seiche involves a series of standing waves created by seismically induced ground shaking (or volcanic eruptions or explosions) that occur in large, freestanding bodies of water. A tsunami is a series of waves that are caused by earthquakes that occur on the seafloor or in coastal areas. There are no large bodies of surface water that could sustain a seiche near the Campus or the University Community, and the potential for seismic events and ground shaking in the vicinity is low (Merced County 2004). Mudflows would require steep slopes, and there are no steep slopes within the boundaries of the Campus or the University Community. No impact would occur.

4.8.5 METHODOLOGY FOR EVALUATING EFFECTS

The evaluation of hydrology and water quality effects is based on professional standards and the conclusions of technical reports prepared for the proposed project. The key effects were identified and evaluated based on the physical characteristics of the project study area and the magnitude, intensity, and duration of activities. Site-specific analysis and computer modeling for the stormwater pre-development and post-development for the Campus and the University Community were conducted by Stantec, Inc. These calculations were based on land use assumptions, topographic mapping, and soils data, as well as the storm drain design criteria set forth by the Merced County Department of Public Works and supplemented by MID. Indoor and outdoor (irrigation) water demand at Campus and University Community buildout was estimated by Stantec, Inc. For demand factors and assumptions used by Stantec to estimate water demand, please see **Section 4.14, Utilities and Service Systems**.

4.8.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

This section describes the impacts related to hydrology and water quality from the buildout of UC Merced Campus and University Community and the alternatives to the Proposed Action. It discusses construction-related impacts (temporary, short-term) and operational (permanent, long-term) impacts associated with the development of the Campus and the University Community, and the Proposed Action as a whole. Mitigation measures to avoid, minimize, rectify, reduce, eliminate, or compensate for significant impacts immediately follow each impact discussion, as necessary.

4.8.6.1 Alternative 1 - Proposed Action

Alt 1 – Impact HYD-1: Implementation of the Proposed Action would not result in discharges that would cause the City's Wastewater Treatment Plant to violate water quality standards or waste discharge requirements. (*Less than Significant*)

Campus and Community

The proposed project is currently located in unincorporated Merced County and, with the exception of a portion of the campus site, is not connected to or served by the City of Merced Wastewater Treatment Plant (WWTP). Wastewater generated on the Phase 1.1 Campus is currently discharged to the City of Merced sewer system and is treated at the City's of Merced WWTP. It is anticipated that wastewater from the next phase of campus development would also be discharged to and treated at the City's WWTP. With respect to the remainder of the campus and all of the University Community, as noted in **Section 2.0, Project Description**, two scenarios are under consideration for the treatment and disposal of wastewater generated by the remaining portion of the Campus and all of the University Community: (1) collection and conveyance of all wastewater generated within these areas to the City of Merced WWTP for treatment and disposal, and (2) collection and conveyance of all wastewater generated in the Campus and University Community to an on-site wastewater treatment facility for treatment and disposal. Impacts on water quality stemming from the discharge of treated effluent under each scenario are evaluated below.

Impact Related to City of Merced Wastewater Treatment Plant

The City of Merced WWTP discharges treated effluent under a waste discharge requirement order (WDR) from the RWQCB. The WDR establishes limits on the volume and concentrations of constituents in the treated effluent that is discharged by the WWTP. An exceedance of a WDR can occur under two conditions: the total volume of wastewater received by the WWTP exceeds the plant's treatment capabilities, or the wastewater contains constituents that cannot be adequately treated by the WWTP such that discharge of treated effluent exceeds the permit limits established in the WWTP's WDR.

With the growth of the campus, additional wastewater would be generated and under the first scenario, would be discharged into the City's collection system for treatment at the City's WWTP. Similarly, under this scenario, wastewater from the University Community would be discharged to the City's sewer system. As explained in detail in **Section 4.14, Utilities and Service Systems**, adequate treatment capacity is projected at the City's WWTP to handle increased flow from the Campus and University Community. Furthermore, wastewater from the expanded campus and the University Community would be similar to wastewater discharged from other parts of the City and would not contain constituents that

could cause the City's WWTP to exceed its waste discharge requirements that apply to the discharge of treated effluent. The use of hazardous materials, including biohazardous materials, would occur in the teaching and research laboratories on the campus and could also occur within the research and development facilities on Community North. The Campus Department of Environmental Health and Safety (EH&S) has developed and implemented comprehensive programs to handle these wastes on the campus. **Section 4.7, Hazardous Materials and Public Safety**, includes a discussion of the programs implemented by EH&S for handling hazardous wastes such as chemical and biological agents. EH&S has established drain disposal guidelines for all campus laboratories. These guidelines prohibit the discharge of hazardous materials into sinks and drains on the campus. Although hazardous materials use is projected to increase under the Proposed Action because the amount of laboratory space and associated faculty and students is expected to grow, similar to existing conditions, all new laboratories would be required to comply with campus procedures and guidelines. Similarly, the types of activities and land uses on the University Community would be typical of residential and commercial land uses in other areas in the City. Furthermore, research & development (R&D) facilities within the University Community would be subject to federal, state and local laws and would be under the oversight of the local Certified Unified Program Agency (CUPA). In addition, these facilities would be required to comply with the WWTP's limits on the types of materials that can be discharged into the sewer system.

Because there would be adequate treatment capacity, and because of the Campus' EH&S program that controls drain discharge of hazardous materials and other controls on the discharge of wastewater from the University Community, the discharge of wastewater from the Campus and University Community would not result in a violation of the City's WWTP waste discharge requirements. The impact would be less than significant.

Impact Related to the Development of an On-Site WWTP

In the event that the Campus and the University Community are not annexed into the City of Merced, the Campus and University Community would need to seek alternative methods to treat and dispose the wastewater generated on site. Under such a scenario, a local wastewater treatment plant would be developed to handle the flows from the Campus and the University Community. It is anticipated that the effluent would tertiary treated to Title 22 requirements and piped to nearby agricultural fields, or used for on-site irrigation and for recharge of the groundwater aquifer. The ultimate decision would be based on the ability of the Campus or the County/Special District to obtain a National Pollutant Discharge System (NPDES) permit from the Central Valley Regional Water Quality Control Board, the local demand for non-potable water, the environmental impacts, and the financial feasibility of the infrastructure. If constructed by the University, the University will also evaluate new wastewater treatment and recycling plant technologies that allow the recycling of up to 95 percent of wastewater flow volume and only 5

percent of the treated effluent requires disposal. The University will also evaluate a Zero Liquid Discharge (ZLD) system to eliminate discharge of the remaining 5 percent of wastewater from the wastewater treatment system. Because the wastewater effluent would be tertiary treated to Title 22 requirements and would be discharged to land or surface waters only if allowed by the RWQCB (in essence it would comply with the WDRs established for that facility), the impact related to an exceedance of waste discharge requirements would not occur. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-2: Construction-related earth disturbing activities under the Proposed Action would result in soil erosion and sedimentation, but water quality would not be adversely affected. (*Less than Significant*)

Campus

Construction of the UC Merced Campus would require grading and excavation activities that could cause erosion and sedimentation that could degrade the receiving water quality. Construction site run-off as well as dust generated from construction activities could enter the receiving waters. Spills or leaks from heavy equipment and machinery (petroleum products and other heavy metals), staging areas, and building sites could also adversely affect receiving water quality.

However, to reduce or eliminate construction-related water quality effects and to comply with the requirements of the CWA, before onset of any construction activities, as required by law, UC Merced or its contractor(s) would obtain coverage under the State NPDES General Construction Permit. The UC Merced Campus would be responsible to ensure that construction activities comply with the conditions in this permit, which requires development of a SWPPP, implementation of BMPs identified in the SWPPP, and monitoring to ensure that effects on water quality are avoided or minimized. NPDES regulations require the preparation and implementation of a SWPPP for any project that would disturb 1 acre or more of land.

As part of this process, UC Merced would implement multiple erosion and sediment control BMPs in areas with potential to drain to surface water. These BMPs would be selected to achieve maximum sediment removal and represent the Best Available Technology (BAT) that economically achievable. BMPs to be implemented as part of this permit may include, but are not limited to, temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover). Drainage facilities in downstream off-site areas would be protected from sediment using BMPs identified in the SWPPP. Grass or other vegetative cover would be established on the disturbed areas as soon as possible after

disturbance. Final selection of BMPs will be subject to review by UC Merced. The Campus would verify that an NOI and a SWPPP have been filed before allowing construction to begin. The Campus or its agent would perform routine inspections of the construction area to verify that the BMPs specified in the SWPPP are properly implemented and maintained. In the event that routine inspection identifies an issue of noncompliance, the Campus would notify its contractors of the issue and require corrective action.

UC Merced or its contractors would use standard containment and handling protocols to ensure that construction vehicles and equipment do not leak any material that might harm the quality of local surface or groundwater. In addition, improper use and storage of fuels, oils, and other construction-related hazardous materials, may also pose a threat to surface or groundwater quality. The Campus or its contractor would develop and implement a spill prevention, control, and countermeasure program (SPCCP) to minimize the potential for, and effects from, spills of hazardous, toxic, or petroleum substances during construction activities. The program would be completed before any construction activities begin. Implementation of this program would comply with state and federal water quality regulations and reduce the impact to a less-than-significant level. The Campus would review and approve the SPCCP before onset of construction activities. The Campus would routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. The Campus would notify its contractors immediately if there is a noncompliance issue and would require compliance.

The federal reportable spill quantity for petroleum products, as defined in the EPA's CFR (40 CFR 110) is any oil spill that (1) violates applicable water quality standards, (2) causes a film or sheen upon or discoloration of the water surface or adjoining shoreline, or (3) causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. If a spill is reportable, the contractor's superintendent would notify the Campus and the Campus would need to take action to contact the appropriate safety and clean-up crews to ensure the spill prevention plan is followed. A written description of reportable releases must be submitted to the RWQCB. This submittal must include a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases would be documented on a spill report form.

If an appreciable spill occurs and results determine that project activities have adversely affected surface or groundwater quality, a detailed analysis would be performed by a Registered Environmental Assessor to identify the likely cause of contamination. This analysis would conform to American Society for Testing and Materials (ASTM) standards, and would include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Campus and its contractors would select and implement measures to control contamination, with a performance standard

that groundwater quality must be returned to baseline conditions. These measures would be subject to approval by the Campus. Compliance with these provisions of the law would result in a less than significant impact on receiving waters from construction activities on the Campus site.

University Community

Construction of the University Community would have the potential to result in the same effects on receiving waters for the same reasons mentioned above. All construction projects affecting more than 1 acre of area would be required by law to apply for coverage under the State NPDES General Construction Permit, implement a SWPPP and ensure that surface or ground water quality is not adversely affected by construction activities. Similarly, all requirements with respect to the preparation and implementation of a SPCCP would also apply to construction activities within the University Community. Compliance with these provisions of the law would result in a less than significant impact on receiving waters from construction activities on the University Community site.

Conclusion

The combined impacts from construction activities within both the Campus and University Community would be similar to the impacts of the two separate components. For reasons presented above, the impact on water quality from the construction of the Proposed Action would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-3: Dewatering activities performed during construction of the Proposed Action would not result in the discharge of sediments or pollutants into receiving waters, potentially affecting water quality. (*Less than Significant)*

Campus and Community

Excavation activities associated with the construction of the Campus and University Community have a potential to encounter shallow groundwater in the vicinity of the Cottonwood Creek, Fairfield Canal, Le Grand Canal, and Black Rascal Creek. Extracted groundwater is generally not expected to contain any contaminants because historically, there have not been any urban uses at the site of the Proposed Action. However because portions of the site, particularly Community South, have been used for agricultural purposes, groundwater could contain pesticides and herbicides at concentrations that could require special handling. Discharge of construction-related dewatering effluent could therefore result in the release of contaminants to surface water or groundwater.

A pump test was conducted in 2002 within the University Community site to determine whether groundwater represented a reliable potable water resource for the community (CH2MHill 2004). Additional test wells for groundwater could be drilled and pumped within the Campus and University Community areas. These pump and well tests would generate large volumes of water, (i.e., 2 to 4 million gallons during a 24–48 hour period) during pump tests. The extracted groundwater would be disposed of within a stormwater conveyance system, MID canals, or into natural drainage channels within the Campus and Community sites. If the water is discharged to the ground surface, the discharge could result in increased sediment loads, or contaminate receiving waterways if the water quality exceeds waste water discharge requirements, and could result in a potentially significant impact on surface water quality.

For all projects that are expected to discharge dewatered effluent or water extracted from well pump tests, the construction contractor would obtain a NPDES No. CAS000002 and Waste Discharge Requirements (WDRs) from the CVRWQCB. Depending on the volume and characteristics of the discharge, coverage under the CVRWQCB's General Construction Permit or General Dewatering Low Threat Discharge Permit, Order No. 5-00-175, NPDES CAG995001 would be required. As part of the permit, the permittee would design and implement measures as necessary so that the discharge limits identified in the relevant permit are met. As a performance standard, these measures would be selected to achieve maximum sediment removal and represent the best available technology (BAT) that is economically achievable. Implemented measures may include retention of dewatering effluent until particulate matter has settled before it is discharged, use of infiltration areas, and other best management practices (BMPs). Final selection of water quality control measures would be subject to approval by the Campus in the case of projects on the Campus site, and by the County or the City of Merced in the case of projects on the University Community site. Implementation of the Proposed Action would require permit issuance by the CVRWQCB, as described above, which will stipulate BMPs and the use of BAT. Permit issuance and compliance with measures required by the permits would reduce project impacts associated with the release of contaminants to surface water or groundwater and the potentially significant impacts on surface water quality.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-4: The Proposed Action would not substantially deplete groundwater supplies such that the production of existing nearby wells would drop to levels that would not support the uses. (*Less than Significant)*

Campus and Community

Groundwater is planned as the source of potable water for the Campus and the University Community. Because of the size of the proposed project, there is a general concern that the groundwater used to supply the proposed project could potentially cause a lowering of groundwater levels in the project vicinity and thereby affect local residents in the project area who also rely on groundwater for their potable water supply. In 2004, when the County was preparing the EIR for the University Community, as previously proposed, this concern prompted studies to determine the effects associated with the increased pumping. The County of Merced conducted site-specific studies, including on-site well testing, geohydrologic studies, and groundwater modeling, to determine the effect of groundwater pumping of three wells that would serve the Campus and the University Community on adjacent domestic wells that serve the nearby residents. The analysis showed that groundwater interference could affect the ability of some of the local wells to supply water at the existing rates. However, the potential long-term drawdown of the shallow and deep aquifers in the vicinity of the University Community would not have any environmental effect other than lowering groundwater levels by 25 to 35 feet in the area of the rural residences west of Lake Road (Merced County 2004). The study found that after 100 years the drawdown in the immediate vicinity of the campus well would be about 50 feet. The study determined that approximately 70 percent of the drawdown would occur after 10 years and about 90 percent of the drawdown would occur after the first 30 years of pumping. The UCP EIR states, "The full effect of the drawdown would occur over a period of more than 30 years or more."

In light of the changes to the Campus and University Community projects, the previous analysis was examined to determine whether it was still valid or whether the revised projects could result in additional impacts previously not identified in that study. As a first step, the 2004 analysis is summarized below. Next, the various attributes of the Proposed Action, including the demand for groundwater by the Campus and University Community, are compared to the attributes of the previously proposed Campus and University Community projects to determine whether the previous analysis would still be valid.

The analysis of the impact of the development of the Campus and University Community was completed by CH2M Hill in February 2004 for the UCP EIR. The complete analysis is available in Appendix F of the UCP Supplement to the Draft Environmental Impact Report, July 2004. The study evaluated the effect of the project on local groundwater resources based on the change in groundwater levels that would result from three factors: (1) increases in pumping from the aquifer; (2) changes in groundwater recharge due to

changes in land use; and (3) reduction in pumping due to a reduction in agricultural irrigation. Although the University Community was defined as the project in the UCP EIR, CH2M Hill also included the Campus in this analysis. Therefore, the study used the estimated total annual demand for groundwater from the UC Merced LRDP EIR of 3,620 acre-feet to derive the pumping rate for the campus well. The 2004 study assumed that all of the required water for the campus would be pumped from one well located near the intersection of Bellevue and Lake roads. With respect to the University Community, the study used an estimated annual demand of 3,583 acre-feet and assumed that this water would be pumped using two wells, one near the intersection of Cardella Road and Lake Road and the second well near the intersection of Yosemite Avenue and Lake Road. Similar to City groundwater wells, all three wells were assumed to draw water from the deep aquifer and not from the shallow aquifer, which is used by the adjacent residences to draw water. All three wells were modeled to pump groundwater at these rates for a period of 100 years.

In addition, the study accounted for the reduction in recharge with the change in land use (from agricultural and open space to urban impervious surfaces, and also the reduction in recharge from the discontinuation of irrigation and present agricultural uses). Using the reduction in recharge, the assumed locations of the three wells, the pumping rates described above, the regional hydrogeologic model, and pump test data, the study modeled the effect of the land use change on groundwater levels. To evaluate whether the previous analysis would be valid for the Proposed Action, the relevant attributes of the Proposed Action were examined. The Proposed Action involves the development of essentially the same area as was previously evaluated in the 2004 analysis and the land uses are essentially the same as those as previously evaluated. The primary changes are a shift in location and a reduction of about 277 acres in the overall footprint of the project from approximately 3,043 acres (910-acre Campus and 2,133-acre University Community) to approximately 2,766 acres (815-acre Campus and 1,951-acre University Community). Therefore, the analysis of reduction in recharge included in the 2004 study is still valid and is, in fact, considered conservative.

The other variable that is important to this analysis is the rate of groundwater pumping, which was determined based on total annual demand. The annual demand numbers previously used were compared to the annual demand that is now projected for the Proposed Action. **Table 4.8-6, Summary of Annual Water Demand**, provides the estimated water demand for the Proposed Action broken down in terms of indoor and outdoor water use for the Campus and the University Community. The table also reports the existing groundwater use on the site. Phase 1.1 Campus currently uses about 158 acre-feet of water, which is obtained from the groundwater aquifer. Approximately 776 acre-feet of groundwater is used to irrigate the pastures within Community North. All of the irrigation water used on the LWH Farms and water used on flood-irrigated pastures within Community North is not included in this table

as that water is obtained from surface water sources (MID) and not groundwater wells. There is a small amount of groundwater use that currently occurs on the LWH Farms associated with the three farmsteads on the property. That annual usage is not available but is expected to be small and would not affect the reported numbers in any substantial manner. The table reports the net groundwater that would be needed to serve the Campus and University Community as currently proposed. Note that the net demand estimates for the Campus and University Community are conservative because the numbers assume that both indoor and outdoor water demand would be met by groundwater. As stated in **Section 2.0, Project Description**, the Campus would identify alternate sources of water for outdoor use, including, but not limited to, recycled water, gray water, raw water from MID canals, and stormwater. Similar options would be pursued for the University Community. Therefore, the actual demand for groundwater would be lower than reported in this table.

Table 4.8-6
Summary of Annual Water Demand (acre-feet/year)

Development Area	Projected Indoor Water Demand	Projected Irrigation Demand [3,4]	Projected Total Water Demand	Existing Ground Water Use	Projected Net Groundwater Demand	Water Demand Per 2004 Study
Campus[1]	1,611	776	2,387	159	2,228	3,620
University Community[2]	2,430	2,349	4,779	754	4,025	3,583
Total Water Demand	**4,041**	**3,125**	**7,166**	**913**	**6,253**	**7,203**

Source: Stantec, Inc. 2008
Note: All numbers based on the assumption that a high degree of water conservation will be achieved
1 Based on 15 gallons per day (gpd) per person and 55 gpd per bed
2 Based on 20 gallons per day (gpd) per employee, 70 gpd per resident and 10 gpd per elementary, middle and high school student
3 Percent of acreage that is irrigated is based on land coverage percentage projections by Clascape, May 30, 2008
4 Based on an irrigation rate of 3.0 feet per year for turf and 2.5 feet per year for non-turf uses for Campus and Community North; Based on an irrigation rate of 4.0 feet per year for turf and 3.0 feet per year for non-turf uses for Community South.

A comparison of the water demand numbers in the previous study and the net water demand estimates for the Campus and University Community provided in the table above shows that the estimated demand for groundwater would be lower than the demand previously analyzed. Based on the above, the previous analysis is considered to be valid and conservative given the revised project.

In summary, if the Proposed Action were developed as proposed and if two new wells were to be constructed at the locations modeled and the existing campus well was to be used at pumping rates

comparable to the rate previously analyzed, the water table would be expected to decline by 25 to 35 feet in the area west of Lake Road over a period of 100 years with 70 percent of the drawdown occurring after 10 years of pumping at these rates and about 90 percent of the drawdown occurring after the first 30 years of pumping.

The drawdown of groundwater levels could affect the ability of some of the local private wells to supply water at the existing rates (Merced County 2004). The amount of disturbance to the existing wells would depend on their distance from the new proposed wells and their depth. The primary effect of a 25 to 35 foot drop in the groundwater table would be that nearby residential wells that are screened at these depths would no longer yield water (the nearby wells are typically screened at a depth of 30 feet) and would need to be deepened (Merced County 2004).

The CH2M Hill study noted that the effect on nearby wells could be avoided by locating the new wells within the University Community such that they are distant from existing wells (note that the 2004 analysis assumed all three wells to be located adjacent to Lake Road). Furthermore, this impact on adjacent wells would be minimized because wells within the University Community would be developed in compliance with UCP Policies IW 11.2, 11.3, and 11.4, which would ensure that the groundwater wells are developed consistent with the City of Merced, MID, and the Merced's Water Supply Update Plan standards. UCP Policies IW 8.1 and 12.6 would ensure that groundwater extraction does not result in drawdown that would "substantially" reduce the production rate of nearby wells (Merced County 2004). The Merced Code and UCP Policies IW 8.1, 11.2, 11.3, 11.4, and 12.6 would ensure that new wells constructed as part of the proposed University Community or an additional well on the Campus (should one be needed) would not substantially interfere with the ability of the existing adjacent wells to supply water at existing rates and in sufficient quantity. In addition, the Campus would implement low-impact development techniques on the campus to maximize the infiltration of storm water into the underlying aquifer to the extent feasible and minimize the decline in groundwater levels. It should also be noted that the analysis above is conservative in that it assumes that irrigation water, which would make 43 percent of the total demand within the Campus and University Community, would be obtained from groundwater aquifer. As discussed in the Project Description, for both the Campus and University Community alternate water sources such as a recycled water plant, storm water and water from MID canals will be pursued to provide water for irrigation and other non-potable uses. The impact on nearby wells would be less than significant.

Although a drawdown effect on adjacent wells will be avoided by carefully siting the new wells, and complying with the City of Merced Code related construction of new wells and with UCP policies, in the event that drawdown effects on adjacent wells are not completely avoided by careful placement of the wells on the Campus and in the University Community, the adjacent private wells could require

deepening. The impact from well deepening is considered an economic impact because some cost would be incurred by the owners of these private wells in order to deepen their wells. CEQA notes that an economic impact is to be considered significant only if in turn result in a significant impact on the environment. NEPA requires the consideration of social and economic impacts under the overall consideration of impacts on the human environment. However, NEPA also notes that socioeconomic impacts may only be considered if they accompany physical impacts. Well deepening would not involve any physical environmental effects. No further discussion is required. For the Proposed Action's impact on the regional aquifer, see **Cumulative Impact HYD-5** in **Section 5.0, Cumulative Impacts**.

Conclusion

For reasons presented above, pumping of groundwater to serve the Campus and University Community would not result in significant impacts on adjacent wells.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-5: The new impervious surfaces added by the Proposed Action would not substantially interfere with groundwater recharge such that there would be a net deficit in aquifer volume. (*Less than Significant*)

Campus

The campus is located in an area that is known to have soil types with low to moderate recharge potential. There are substantial amounts of clay in the campus site soils, which restrict the ability of surface water to migrate down to the shallow groundwater aquifer. Also there is a clay hard pan near the ground surface that further inhibits the potential of surface water to infiltrate down to the groundwater aquifer (See **Section 4.6, Geology and Soils**). Based on these known soil characteristics of the Campus site, development within this area would not substantially reduce infiltration of surface water to subsurface groundwater aquifers. Furthermore, the Campus has policies to develop the campus in a sustainable manner (LRDP Policies SUST-1 and SUST-2) which would maximize percolation and infiltration of precipitation into underlying groundwater by using Low Impact Development (LID) methods, developing bioswales, single project or multi-project detention or retention basins, and preservation and use of natural drainage areas, to the extent feasible.

University Community

Similar to the Campus, the University Community is located in an area that is known to have soil types with recharge potential ranging from low to moderate although soils of higher permeability are present

in small areas dispersed throughout the southern half of the University Community site. Based on these known soil characteristics of the University Community, development would not have a substantial impact to the infiltration of surface water to subsurface groundwater aquifers. In 2004, the County estimated that the development of the University Community site would result in a net reduction in potential recharge of only 269 acre-feet per year (Merced County 2004). The impact would be less than significant. Furthermore, development within the University Community would be required to comply with UCP Policy IW 4.3, which requires the development of groundwater recharge basins in areas that are identified to have high recharge potential where feasible. In addition, there are other locations within the project site that have higher recharge soil types. These areas include Cottonwood Creek and other MID earth-lined canals. No alterations to these features are proposed. Therefore, these areas would still have the potential to allow surface water infiltration and recharge of the groundwater aquifers.

Conclusion

Due to site characteristics and the 2009 LRDP and UCP policies that are included in the Proposed Action, the impact of new impervious surfaces on groundwater recharge at the project site would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-6: The Proposed Action Alternative would increase the amount of storm runoff and alter existing drainage patterns, but would not increase the risk of flooding downstream and flooding to Cottonwood Creek and Fairfield Canal. ***(Potentially Significant; Less than Significant)***

Campus and Community

New construction associated with the development of the Campus and the University Community would include new impervious surfaces that would generate more stormwater runoff than the volume that is generated under existing conditions, although as discussed above, because of the low permeability of project site soils, the increase in runoff would not be large. However, there would be an increase in the rate and amount of runoff and if discharged uncontrolled to surface waters could result in or exacerbate flooding in downstream areas. In addition, existing drainage patterns would be altered by the construction of facilities.

Currently, with the exception of Phase 1.1 Campus where runoff is captured and directed to two on-site ponds before discharge into Fairfield Canal, all other areas of the Campus and the University Community are undeveloped and not served by a storm drain system. Stormwater within the western portion of the

Campus and Community North that does not percolate runs in a southerly to southwesterly direction into Cottonwood Creek which continues in a south southwesterly direction on the east side of Lake Road, crosses under Lake Road in a culvert near Cardella Road, to continue east to its confluence with Fahrens Creek. Ponding occurs on the east side of Lake Road due to a capacity constraint in the culvert under Lake Road. The runoff from the east side of the campus site and Community North including the "third irrigation pivot" area that is now included in the Proposed Action, generally sheet-flows in a southeasterly direction onto adjacent lands where it evaporates or percolates. The two on-site canals, Fairfield and Le Grand Canals, interrupt the flow of stormwater runoff in various locations, causing stormwater to pond on the upgradient side of the canal levees. Occasionally, the stormwater tops and enters the canals. A substantial amount seeps underneath the canals and continues to flow in a downgradient direction.

Le Grand and Fairfield canals are used to release water from Lake Yosemite for irrigation during spring and summer and are not used for irrigation in fall and winter. Both canals are used in the wet season to drain excess floodwater from Lake Yosemite. Although south of Yosemite Avenue, Fairfield Canal runs in the southerly direction and crossed under Bear Creek in a siphon, the canal is set up to discharge into Bear Creek as necessary just downstream of Black Rascal diversion channel.

With the development of the campus, the on-site drainage pattern would be altered and additional runoff that is generated would be collected by the storm drainage system, detained, and then discharged into Fairfield Canal at a discharge rate established by MID. Under normal conditions, because the canal is not used during fall and winter to convey irrigation water, Fairfield Canal would have capacity to handle the stormwater discharged by the Campus and the University Community. To ensure that stormwater beyond the capacity of the canal is not discharged into the canal, MID would install water elevation detectors in the canal which would determine when releases to the canal would be allowed.

MID has been monitoring and coordinating its canal discharges to Bear Creek with discharges from other facilities, including the USACE facilities at Bear Creek and Burns Reservoirs. This coordination ensures that releases from all major sources do not exceed the capacity of Bear Creek and result in downstream flooding. MID would continue its practice and would control the amount of stormwater that it allows the Campus and the University Community to discharge into Fairfield Canal. This would involve detaining stormwater to reduce peak flows. As discussed below, the Campus and University Community will be designed with the ability to detain stormwater from a 100-year, 24-hour storm. Therefore, stormwater runoff from the Campus and University Community would not result in or exacerbate flooding in Bear Creek.

MID has indicated that in the event that the entire capacity of Fairfield Canal is needed to convey floodwaters from Lake Yosemite, the Campus and University Community must be designed to hold runoff from large storm events until such time that capacity in the canal becomes available to receive campus or community runoff. Therefore, both the Campus and University Community would be designed to detain stormwater flows that would result from a 100-year, 24-hour storm event. The estimated runoff from a 100-year, 24-hour storm event is reported in **Table 4.8-7, Pre- and Post-Development Storm Water Runoff Volume**, along with the area needed to site facilities that can detain these flows. Based on a preliminary evaluation, adequate land is available to site detention facilities within the Campus and University Community. Note that detention capacity could be provided in the form of surface impoundments or underground detention vaults. These detention facilities would also help address the flooding that occurs within Cottonwood Creek on the east side of Lake Road by detaining and slowly releasing stormwater. Note that the land area between the project property line along Lake Road and Campus Parkway alignment within the Campus and the University Community is a potential candidate site for a linear stormwater detention facility.

The provision of detention basins as part of new development complies with and exceeds the County of Merced Drainage Standards, which require new developments to be designed to handle the 10-year, 24-hour storm event, and the requirement the new developments shall not result in the increase of natural drainage flow beyond the pre-development 100-year, 24-hour storm event. Furthermore, all development within the University Community would be required to comply with UCP Policies IW 1.9, 1.10, 4.7, 11.10, 11.11, 12.3, and 12.4, all of which are designed to ensure that no adverse impacts are created downstream of the University Community.

Conclusion

In summary, the development of the Campus and University Community would alter drainage patterns and generate increased stormwater runoff. However, stormwater detention and retention facilities (if necessary) are included in the Proposed Action to control both the peaks and the total volume of stormwater runoff before discharge into Fairfield Canal and Cottonwood Creek, and therefore there would be no flooding impacts in downstream areas. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Table 4.8-7
Pre- and Post-Development Storm Water Runoff Volume

	Campus	Community North	Community South
10 Year, 24 Hour Storm Runoff Volume (acre-feet)			
Pre-Development Total Runoff	137.3	84	95.6
Post-Development Total Runoff	161.3	128.2	140.6
Difference in Runoff	24	44.2	45
Park/Open Space (in acres)	100	81	148
Basin Depth (in feet)	1.6	1.6	1.0
100-Year, 24-Hour Storm Runoff Volume (acre feet)			
Pre-Development Total Runoff	223.7	131.4	148.7
Post-Development Total Runoff	250.9	183	201.4
Difference in Runoff	27.2	51.6	52.7
Park/Open Space (in acres)	100	81	148
Basin Depth (in feet)	2.5	2.3	1.4

Source: Stantec 2008

Alt 1 – Impact HYD-7: The Proposed Action would not substantially increase the amount of sediment and urban pollutants in the site runoff and therefore would not result in water quality degradation. (*Less than Significant*)

Campus and Community

Urban runoff typically contains a variety of pollutants that are a result of human activity. These pollutants deposit on urban surfaces and accumulate until they are mobilized by water, typically stormwater. These pollutants include oil and grease, coliform bacteria, heavy metals such as lead, copper and zinc, and suspended solids. Pesticides, herbicides and other similar products can also be present in urban runoff. The most common sources of these pollutants are automobile operations, littering, improper storage of materials, residential maintenance activities, domestic animals, and pavement wear. Urban uses that would be established within the Campus and University Community would have the potential to result in the discharge of these pollutants into receiving waters via site stormwater runoff. The receiving waters would be Fairfield Canal and Cottonwood Creek, both of which eventually discharge into Bear Creek.

The CWA was amended in 1987, which required the EPA to implement a program to control the discharge of pollutants into surface water from non-point sources. The EPA determined that this program would be implemented in two phases. Phase I permitting program, which was promulgated in 1990, required municipal separate sewer systems serving populations of 100,000 or more to obtain an NPDES permit for its storm water discharges and to develop and implement a Storm Water Management Program (SWMP) for the control of urban pollutants. Phase II permitting program, which was promulgated in 1999, required storm water discharges from small municipal separate storm sewer systems (serving populations of less than 100,000 to also apply for coverage under an NPDES permit and to control the discharge of urban pollutants in storm water runoff. NPDES regulations require all Phase II communities to develop and implement a SWMP that includes six Best Management Practices (BMPs) that are aimed at addressing urban runoff pollutants. The Campus has not yet been designated an NPDES Phase II community by the CVRWQCB. However, as and when the Campus is so designated, it will prepare and implement a SWMP. The SWMP would include urban runoff management programs that the University would implement to control pollutants before they enter the waterways. Furthermore, in compliance with the Campus' sustainability goals, all future development within the campus will be designed to be LID and would also include bioswales and detention basins, which would provide treatment to site runoff before discharge into Fairfield Canal or Cottonwood Creek. As discussed under Impact HYD-5, similar to the current practice for runoff from the Phase 1.1 Campus, storm water generated in the new areas of the campus as they are developed would be detained in detention basins before discharge into Fairfield Canal. The detention of stormwater and its slow release into the canal would ensure that sediments in the stormwater would settle out and the quality of water would be appropriate for discharge into Bear Creek, which is the final discharge point for Fairfield Canal. Continuation of current practices and compliance with Phase II NPDES requirements would reduce the potential for campus runoff to result in impacts on surface water quality.

Similarly, the discharge of urban runoff pollutants would be minimized within the University Community through compliance with Phase II NPDES requirements and UCP Policies IW 8.7, 8.9, and 13.6. The following BMPs or their equivalent are expected to be included in all future development within the University Community.

- Application for a street sweeping program to remove potential contaminates from the street and roadway surfaces before they reach the drainages
- Use of stormwater detention basins to collect and temporarily detain stormwater so that sediment can settle out prior to being discharged into the water ways
- Appropriate signage to all storm drain inlets indication that they outlet to the natural drainage ways

- Installation of a oil and grease and grit separator in drop inlets to capture potential contaminates that enter storm drain systems
- Minimization of sources of concentrated flow be maximizing use of natural drainages to decelerate flows, collect pollutants and suspended sediment
- Establishment of vegetation in stormwater drainages to achieve optimal balance of conveyance and water quality protection characteristics
- Placement of velocity dissipaters, rip rap, and or other appropriative measures to slow runoff, promote deposition of waterborne particles, and reduce the erosive potential of storm flows
- Prompt application of soil protection and slop stabilization practices to all disturbed areas

Compliance with UCP policies and NPDES requirements would reduce the potential impact on surface water quality to a less than significant level.

Conclusion

For reasons presented above, the Proposed Action would not result in a substantial adverse impact on surface water quality from the day-to-day operation of the Campus and University Community. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-8: The Proposed Action would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam. (*Less than Significant*)

Campus and Community

The project site is outside the inundation area of Lake Yosemite Dam, and therefore there is no risk to people or structures on the project site from inundation due to dam failure.

The Fairfield and Le Grand Canals are used for primarily for irrigation water to serve the agriculture uses in the area. In winter months when agriculture is not using irrigation water, the canals are used as flood control channels. Only the Fairfield Canal would be used for conveying stormwater runoff from the project site with concurrence from MID. As described above, detention basins would be designed and incorporated into the drainage infrastructure to hold back the runoff from the storm events until water levels recede in the canal. Sensors would be placed into the canal to determine when the canal is at capacity. Discharges would only occur when the canal has room to handle the additional runoff. All of

this would prevent the canal from overtopping or taking on more storm water runoff than it could handle.

This canal, as well as others in the planning area, has structural integrity inadequacies due to the erosion, tree roots, burrowing animals, and other factors. If the earthen levees controlling the flow were to fail, people and structures within the area could be flooded.

The Campus will work with MID to ensure that all canal levees are properly maintained and the structural integrity of both Le Grand and Fairfield Canals is ensured for the safety of people and structures on the campus.

UCP Policy S 2.1 would ensure that the structural integrity of Fairfield canal would be adequate to control flows within the canals. This includes concrete lining and fortifying or raising the canal levees. Additionally, UCP Policy S 2.2 requires an easement between structures and the canals to protect their structural integrity.

Because MID and the Campus would work together to maintain the levees and UCP polices would protect and improve the structural integrity of the canals in the University Community area, the impact is considered to be less than significant.

Mitigation Measure: No mitigation is required.

4.8.6.2 Alternative 2 - Yosemite Avenue

Impact on Surface Water Quality

The construction- and operations-related impacts associated with hydrology and water quality, including dewatering, for this alternative would be similar to those under the Proposed Action because the area to the south of Yosemite Avenue has similar hydrologic conditions as the rest of the site to the north.

Impact related to Wastewater Disposal

Alternative 2 would be similar to Alternative 1 with respect to treatment and disposal of wastewater, and therefore the impact of this alternative relative to wastewater disposal would also be less than significant.

Impact on Groundwater Levels and Recharge

This alternative would also be similar to Alternative 1 in terms of its impact on adjacent wells because the same amount of groundwater would be drawn from the aquifer under this alternative as under Alternative 1. Because the third groundwater well under this alternative would be located south of

Yosemite Avenue, this alternative could affect additional wells in that area compared to the Proposed Action, which would affect wells primarily west of Lake Road. The likely decline in groundwater levels under this alternative would be comparable to those under the Proposed Action.

Because the amount of land that would be placed under impervious surfaces under this alternative would be comparable to that under the Proposed Action, the potential impact on groundwater recharge would be similar and less than significant.

Impact related to Flooding

The southeastern portion of this alternative site is located within a special Flood Hazard Area of Bear Creek as defined by FEMA, and would therefore result in a potential impact related to exposure to flood hazard, an impact that would not occur under the Proposed Action. A special flood zone is another term used by FEMA to describe areas that are subject to the 100-year flooding. Under the Flood Disaster Protection Act of 1973, Congress wanted to limit the amount of development in areas where known risks to flooding take place. Executive Order 11988 requires that each lead agency shall avoid to the extent possible the long and short-term adverse impacts from occupancy and modification of floodplains and avoid direct and indirect support of floodplain development where a practicable alternative is available. FEMA requires that people or entities that build in these areas carry flood insurance to offset costs associated rebuilding from flood damage. In order to build in this area more hydrologic and hydraulic studies would need to be done to determine what the effects would be to the downstream and upstream areas. Therefore, construction of University Community facilities in this area would be in conflict with FEMA direction to not build or place structures in areas subject to flooding. Additionally, building in the 100-year flood plain would not be consistent with UCP Policies IW 9.4 and 9.7.

4.8.6.3 Alternative 3 - Bellevue Ranch

Impact on Surface Water Quality

The Bellevue Ranch Alternative, although at a different site, would result in similar construction and operational impacts on surface quality as the impacts of the Proposed Action.

Impact related to Wastewater Disposal

Alternative 3 is almost entirely located within the City of Merced and would be served by the City's sewer system. It would therefore not require the construction of an on-site wastewater treatment plant. The impact of this alternative relative to wastewater disposal would be less than significant.

Impact on Groundwater Levels and Recharge

This alternative is located almost entirely within the City of Merced and would be provided water by the City. Construction of a new well to serve the proposed project may still be required. However, the new well would be located per City policy of locating wells without adversely affecting adjacent wells. Therefore, the Proposed Action's less than significant effect related to groundwater wells may be avoided under this alternative.

Because the amount of land that would be placed under impervious surfaces under this alternative would be comparable to that under the Proposed Action, the potential impact on groundwater recharge would be similar and less than significant.

Impact related to Flooding

The Alternative 3 site is located in the 100-year flood zone of Fahrens Creek (FEMA 1995). Since the majority of this area is within the 100-year flood plain as defined by FEMA, impacts associated with flooding are considered to be significant. Although this impact could be reduced to a less than significant level by elevating the development above the base flood elevation, construction of project facilities in the 100-year flood plain would not be consistent with UCP Policies IW 9.4 and 9.7 and with Executive Order 11988 which requires that each lead agency shall avoid to the extent possible the long and short term adverse impacts from occupancy and modification of floodplains and avoid direct and indirect support of floodplain development where a practicable alternative is available.

Alternative 3 would not involve the impact relates to failure of canal levees as no canals are present on that site, although a portion of the site likely is located within the inundation area of Lake Yosemite dam, in the event of dam failure.

4.8.6.4 Alternative 4 - 2002 Proposed Project

Impact on Surface Water Quality

The 2002 Proposed Project would be located at the same location as the Proposed Action but would encompass more land in the northern portion of the project site for development of the campus. The construction and operational impacts on surface and groundwater quality associated with this alternative would be the similar to the impacts of the Proposed Action.

Impact related to Wastewater Disposal

Alternative 2 would be similar to Alternative 1 with respect to treatment and disposal of wastewater, and therefore the impact of this alternative relative to wastewater disposal would also be less than significant.

Impact on Groundwater Levels and Recharge

This alternative would also be similar to Alternative 1 in terms of its impact on adjacent wells because the same amount of groundwater would be drawn from the aquifer under this alternative as under Alternative 1. The new wells would be located in the same general area as under the Proposed Action and the likely decline in groundwater levels under this alternative would be comparable to those under the Proposed Action.

Because the amount of land that would be placed under impervious surfaces under this alternative would be comparable to that under the Proposed Action, the potential impact on groundwater recharge would be similar and less than significant.

Impact Related to Flooding

Similar to the Proposed Action, no portion of the 2002 Proposed Project site is located within a 100-year flood plain. There would be no impacts related to exposure to flooding. Furthermore, the alternate site is not located within the inundation area of any dam. Both Fairfield and Le Grand Canals would be located within the alternative site but for the same reasons as presented above for the Proposed Action, the impact associated with failure of canal levees would be less than significant.

4.8.6.5 Alternative 5 - No Action

Under the No Action alternative, the Campus and Community North would not be built and there would be no associated impacts relating to water quality or hydrology from these two areas. Community South could be developed in the future based on development plans not related to the establishment of the UC Campus in Merced. Impacts from the development of Community South would be similar to those described above for the Proposed Action.

4.8.6.6 Alternative 6 - No Build

The No Build Alternative would involve no new construction and therefore would not result in impacts related to the hydrology and water quality.

4.8.7 SUMMARY COMPARISON OF ALTERNATIVES

All build alternatives (Alternatives 1, 2, 3, 4, and 5) would result in similar impacts related to storm water runoff (Impact HYDRO-1) and dewatering during construction (Impact HYDRO-2).

Alternatives 1, 2, and 4 would involve a demand for groundwater that would be identical and therefore the effect of local groundwater levels would essentially be the same as described above for the Proposed Action (Impact HYDRO-3). Because the demand for water under Alternative 5 would be lower, its impact on the groundwater levels would be smaller. Alternative 3 would likely not draw water from new on-site wells as it would be served by the City's distribution system and therefore is likely to result in no impacts on adjacent wells.

All build alternatives (Alternatives 1, 2, 3, 4, and 5) would involve creation of new impervious surfaces. However, for reasons presented above for the Proposed Action (Impact HYDRO-4), the reduction in groundwater recharge would be less than significant for all alternatives.

All build alternatives would result in similar less than significant impacts on downstream flooding in Bear Creek (Impact HYDRO-5) and would have similar impacts related to urban runoff from the development of project facilities (Impact HYDRO-6).

Alternative 4 (Bellevue Ranch Alternative) would not involve Impact HYDRO-7 which relates to failure of canal levees, although a portion of the site likely is located within the inundation area of Lake Yosemite dam, in the event of dam failure.

Alternative 6 would avoid all impacts related to hydrology and water quality.

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4.9 LAND USE AND PLANNING

4.9.1 INTRODUCTION

This section describes the existing land uses in the project vicinity that could be affected by implementation of the Proposed Action and its alternatives. It also describes the relevant land use plans, policies, and regulations governing the project area affected by the alternatives considered in this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR). The focus of this section is consistency with applicable land use plans and policies. Impacts on agricultural and recreational land uses, as well as those related to growth inducement, are discussed in other sections of this EIR/EIS.

Sources of information used in this analysis include the City of Merced Vision 2015 General Plan (April 1997), Merced County General Plan, and the Merced County Local Agency Formation Commission (LAFCO) policies.

Public and agency comments related to land use and planning received in response to the Notice of Preparation/Notice of Intent issued for this EIS/EIR are summarized below.

- The County noted that the County General Plan currently designates the campus site as "UC Merced" and the University Community Plan area as "Multiple-Use Urban Development." In order for the new boundaries for the Campus and University Community to be considered by the County, the County notes that an application to amend the County General Plan so that the UC Merced Specific Urban Development Plan (SUDP) boundary can be revised, must be submitted by the University and University Community Land Company, LLC (UCLC). The County states that a separate EIR with the County as lead agency should be prepared that addressed the change in SUDP boundary. The County, in exercising its discretion, is not compelled to approve the same plans and boundaries as the Regents and/or the USACE.

- The County notes that the University Community Plan adopted in 2004 represents the collective vision of the County for development of a sustainable and viable community that advances the goals, objectives and policies of the County's General Plan, including preservation of agricultural resources and the enhancement of the County's economic base.

The US Army Corps of Engineers (USACE) and the University understand that the County will conduct an independent review of the changed boundaries of the UCP before the County will amend its General Plan to include the additional UCP acreage within the SUDP. This review will be supported by an EIR that will be prepared by the County as the lead agency.

4.9.2 AFFECTED ENVIRONMENT

This section describes the existing land uses present on the sites of Alternatives 1 through 5. The land use policies applicable to the Proposed Action are fully described in 2002 Long Range Development Plan

(LRDP) EIR (UC Merced 2002) and the 2004 University Community Plan (UCP) EIR (Merced County 2004). That information is summarized below, supplemented by information regarding the additional land that was previously not considered and is now part of University Community under the Proposed Action.

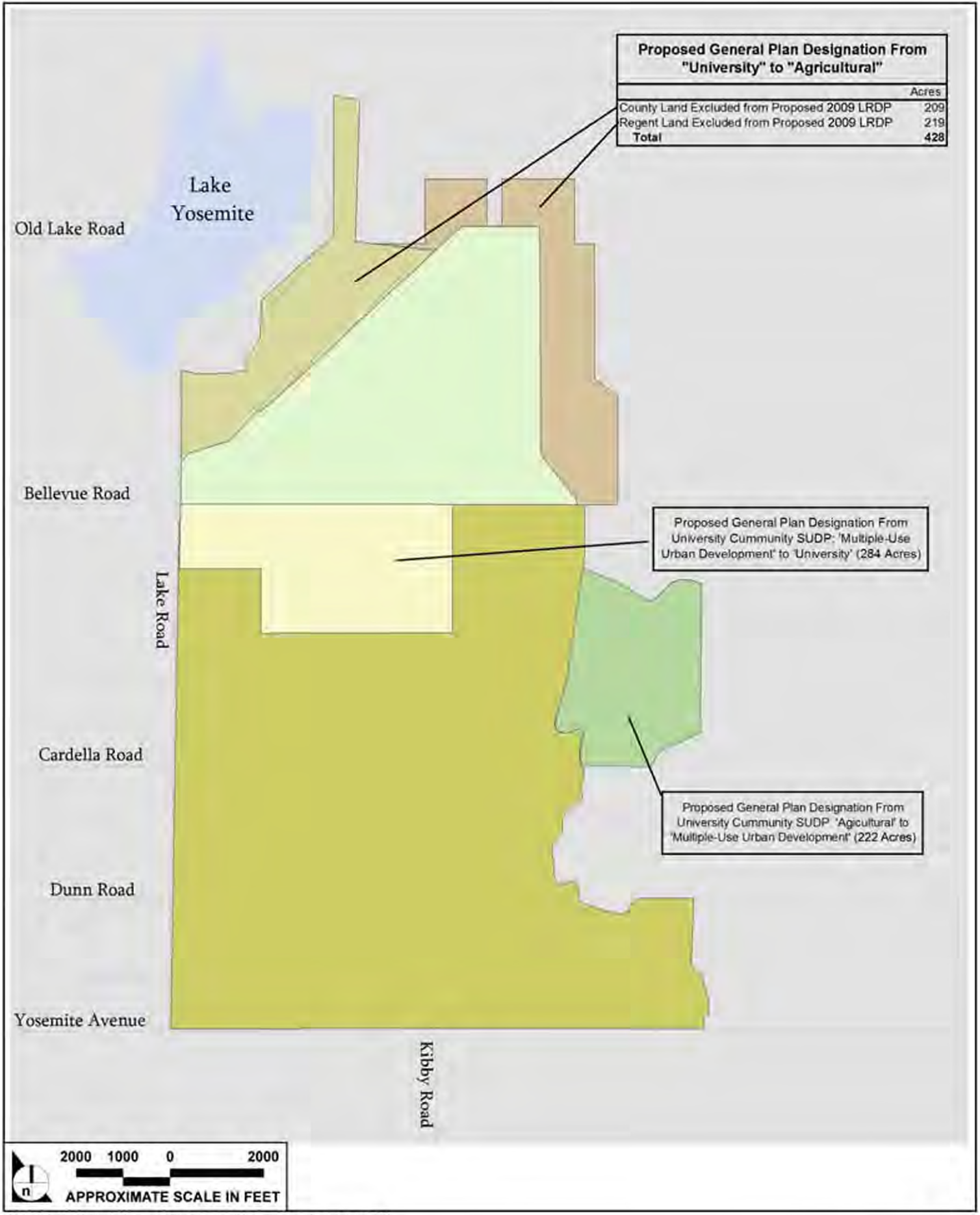
4.9.2.1 Regional Land Use Patterns

The Proposed Action is located within the largely agricultural San Joaquin Valley in Central California. Most of the land located within the valley is used for agriculture. The project site is located in eastern Merced County, in the vicinity of Lake Yosemite Regional Park, about 6 miles northeast of the City center of Merced. The City of Merced is largest of the six incorporated cities in Merced County. The City is a largely agricultural community with various land uses, including industrial, commercial, residential, mixed-use, agricultural, and public and open space lands. The City is also the County seat.

4.9.2.2 Alternative 1, Proposed Action – Existing Land Uses and Designations

The sites of the Campus and University Community are located in unincorporated Merced County to the northeast of the City of Merced. In 1995, Regents selected a 2,000-acre portion of a property owned by the Virginia Smith Trust for the location of the 10th UC campus. In 1996, following the selection of this site for the establishment of the proposed UC campus, Merced County amended its general plan to designate a UC Merced SUDP area within which the future campus and associated community could be located. This 10,600-acre SUDP included all the Virginia Smith Trust (VST) property, the adjacent Cyril Smith Trust (CST) property, the County parcel adjacent to Lake Yosemite Regional Park, and the parcel containing the Merced Hills Golf Course. In 2004, the County certified the EIR for the UCP General Plan Amendment for land south of the original UC Merced SUDP boundaries and adopted the UCP. Following the approval of the UCP, the UC Merced SUDP was modified to remove lands to the north of the campus site and to include lands to the south of the former Merced Hills Golf Course down to Yosemite Avenue. The existing SUDP boundaries are shown on **Figure 4.9-1, Existing and Proposed Specific Urban Development Plan (SUDP).** In addition, the 2004 General Plan amendment resulted in two new urban designations: "UC Merced" for the campus site and "Multiple-Use Urban Development" for the UCP area.

The northern portion of the proposed campus site, above the Bellevue Road alignment, is within the City of Merced's current Sphere of Influence (SOI) while the remainder of the proposed campus and all of the University Community are outside the City's SOI. As part of the General Plan Update that is currently underway, the City plans to revise its SOI to include the entire Campus and University Community as currently approved.



SOURCE: UC Merced: Physical Planning, Design & Construction - October 2008

FIGURE **4.9-1**

Existing and Proposed Specific Urban Development Plan (SUDP)

UC Merced Campus Site

The campus portion of the Proposed Action site consists of an 815-acre area that is proposed to be used for the development of campus facilities. The northern two-thirds of the 815-acre campus is located on lands previously owned by the VST and now owned by the Regents, with the southern one-third of the campus on land that was acquired by the UCLC University from a local land owner in 2001. All campus lands are now owned or will be acquired by the University.

As stated above, following the approval of the UCP, the UC Merced/University Community SUDP was modified to include lands to the south of the former Merced Hills Golf Course up to Yosemite Avenue. The entire campus site as now proposed is located within this SUDP. The northern portion of the campus site above the Bellevue Road alignment is designated "UC Merced" whereas the southern portion is designated "Multiple-Use Urban Development" in the County general plan.

The campus site consists of three existing land uses: the developed Phase 1.1 Campus, grasslands used for seasonal grazing, and land under irrigated pasture. The Phase 1.1 Campus, which was established on the 197-acre site of the former Merced Hills Golf Course and encompasses about 104 acres, is located in the central portion of the campus site northeast of Bellevue Road and Lake Road and is developed with academic buildings, student housing, support buildings, and parking. Rolling grasslands used for seasonal grazing occupy campus lands to the north and northeast of the Phase 1.1 Campus and a barn and a corral are located to the north of the Phase 1.1 Campus. Irrigated pasture occupies campus lands to the south of the Phase 1.1 Campus.

University Community

The University Community is proposed to be made up of the 876-acre Community North and the 1,118-acre Community South. UCLC, a not-for-profit corporation, owns the land that comprises Community North. LWH Farms, LLC, owns the land that comprises Community South.

Community North is predominantly undeveloped pasturelands. There are three large circular pivots that irrigate the pasture in a circular pattern. There are numerous barbed wire fences that divide the Community North area into different grazing pastures. Various dirt roads traverse the pasturelands and provide access to small farm-related structures and water troughs for cattle.

Community South, from Cardella Road to Yosemite Avenue, is cultivated for crops, including tomatoes and corn rotated with wheat and oats. A farmhouse, stables, and barn are located near the western boundary of the Community South, and are accessible from Lake Road.

As described above, following the certification of the UCP EIR in 2004, the County amended the County General Plan, revised the boundaries of the UC Merced/University Community SUDP to include the University Community as defined at that time, and designated the area of the then University Community as Multiple-Use Urban Development. All areas of the University Community as now proposed are included in the UC Merced SUDP boundaries except for approximately 222 acres of land in the eastern portion of Community North (the area of the third pivot) that was previously not included in the University Community.

There are two Agricultural zoning districts within the UC Merced/University Community SUDP. North of Bellevue Road, the land is zoned A-2, Exclusive Agricultural with 160-acre minimum parcel size. South of Bellevue Road, the land is zoned A-1, General Agricultural with 20-acre minimum parcel size. Although this zoning is inconsistent with the County General Plan designation for the SUDP which is Multiple-Use Urban Development, according to the previously adopted UCP, to preclude premature conversion or cessation of agricultural activities, the zoning within the UC Merced/University Community SUDP is to remain agricultural land until such time that plans for the development of the land are advanced.

Surrounding Land Uses

The project site is located adjacent to large open spaces comprised primarily of grazing lands with scattered rural residences, a planned residential community, agricultural lands to the south, and a rural residential center to the southwest. Lake Yosemite Regional Park is located to the northwest of the campus site. To the west of Lake Yosemite is a large established rural residential area with a nearby golf course. A new residential development called the Gallo Project with over 1,260 housing units and more than 187,000 square feet of commercial and public uses is planned to the northwest of the campus site. The area south and west of the intersection of Bellevue Road and Lake Drive is designated Rural Residential Center (RRC) in the Merced County General Plan. Portions of the RRC zoned area that are developed contain single-family rural residences on 1- to 5-acre parcels and a small gated community. The portion of the RRC zoned area along Bellevue Road is lined with some single-family homes. Undeveloped lots within the RRC are used as small pastures or are kept fallow. To the south of the project site (south of Yosemite Avenue), lands are cultivated and under row and field crops. Lands to the east of the University Community are under irrigated pasture or are open grazing lands.

Approved and Planned Future Development

There are four approved specific plans in the City of Merced (Fahrens Creek Specific Plan, Campus North Specific Plan, Northeast Yosemite Specific Plan, and South Merced Community Plan) with a total of

1,024 acres of land that would accommodate about 3,322 housing units. In addition, the Bellevue Ranch Master Plan was approved by the City for the development of 4,643 to 6,648 housing units on a 1,365-acre area located on G Street and Bellevue Road. Some subdivisions within the Master Plan area have been constructed. Other planned land uses in the vicinity of the project site include the Yosemite Lake Estates project to the northwest of the campus site which would develop over 1,260 dwelling units and more than 187,000 square feet of commercial and public uses; Fahrens Creek development plan involving 640 acres; South Thornton development plan involving 350 acres; the Dominion project involving a commercial and residential development on about 174 acres northeast of G Street and Bellevue Road, and Mercy Medical Center which is currently under construction on an approximately 20-acre site at the intersection of G Street and Cormorant Drive. Also in 2007, the Campus Parkway project was approved that would construct a four-lane, limited-access expressway on the eastern side of the City of Merced, extending from Highway 99 to Yosemite Avenue near Lake Road. The City is in the process of acquiring right-of-way to extend this to six lanes to meet traffic needs beyond 20 years.

Although not approved at this time, Merced County Association of Governments is currently evaluating the Atwater-Merced Expressway project that would involve construction of an expressway that would skirt the northwestern and western area of the City of Merced. The expressway would extend from Highway 59 west along Bellevue Road, head south to cross Highway 99, and then extend further south of Highway 99 to link to Highway 140.

4.9.2.3 Alternative 2, Yosemite Avenue – Existing Land Uses and Designations

The Yosemite Avenue Alternative site is located within unincorporated Merced County in the same general area as the Proposed Action. The existing SOI and SUDP boundaries are shown on **Figure 4.9-2, Existing Sphere of Influence and SUDP Boundaries for Yosemite Avenue Alternative.** The existing land uses in the Campus and Community North areas are described above under Alternative 1, Proposed Action. Under this alternative, Community South would encompass 1,187 acres south of Yosemite Avenue, which is designated for "Agricultural" by the Merced County General Plan. The current land use of this area is agriculture with approximately 91 percent in cropland. Community South under Alternative 2 is not within the existing UC Merced/University Community SUDP boundaries. As in the Proposed Action, the Alternative 2 site is largely surrounded by large open spaces comprised primarily of grazing lands with scattered rural residences, a rural residential center to the west, and cultivated row and field crops to the south. To the south of the project site (south of Yosemite Avenue), lands are cultivated and under row and field crops. Lands to the east of the Campus and University Community are under irrigated pasture or are open grazing lands.

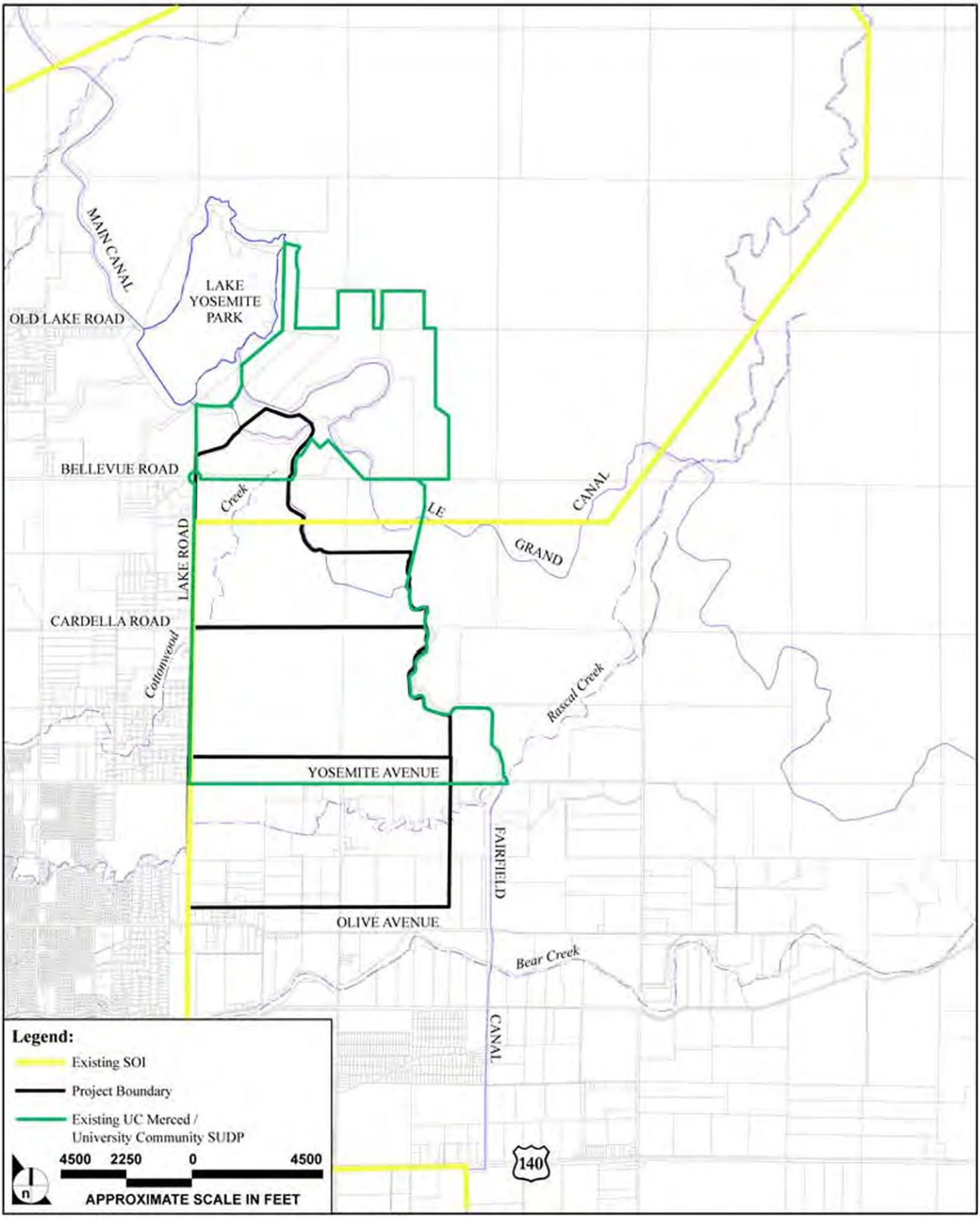
4.9.2.4 Alternative 3, Bellevue Ranch – Existing Land Uses and Designations

Alternative 4 comprises the area commonly identified as the Bellevue Ranch. Approximately 2,550 acres of the site are presently utilized for irrigated pasture and row and field crop production. There are 39 existing ranch complex structures on the site. In 1995, a Specific Plan was approved by the City that provides for a 1,365-acre mixed-use development, including approximately 6,900 residential units on 700 acres, 89 acres of commercial, 23 acres of office, 20 acres of schools, 50 acres of park, and 122 acres of open space on the Bellevue Ranch site. Following that approval, new housing developments have been constructed in the southeastern portion of the site adjacent to G Street, and other housing developments are planned.

The alternative site consists largely of land within the northern portion of the City of Merced's urban boundary and within the City of Merced SUDP boundary, as shown in **Figure 4.9-3, Existing Sphere of Influence and SUDP Boundaries for Bellevue Ranch Alternative**. The SUDP boundary also serves as the City's SOI boundary. The Campus and Community South sites under this alternative are contained entirely within the City's urban limits and the City's SUDP boundaries. The proposed Community North site encompasses land within the City's SUDP boundary, with a small area outside the SUDP in unincorporated County. The alternative site is zoned primarily for low-density residential and planned developments, and includes some areas zoned for office commercial, residential planned development, low to medium density residential, and restricted agricultural uses. The site is largely surrounded by land designated for residential and commercial uses to the west, south and east, and agricultural uses around the northern portion.

4.9.2.5 Alternative 4, 2002 Proposed Project – Existing Land Uses and Designations

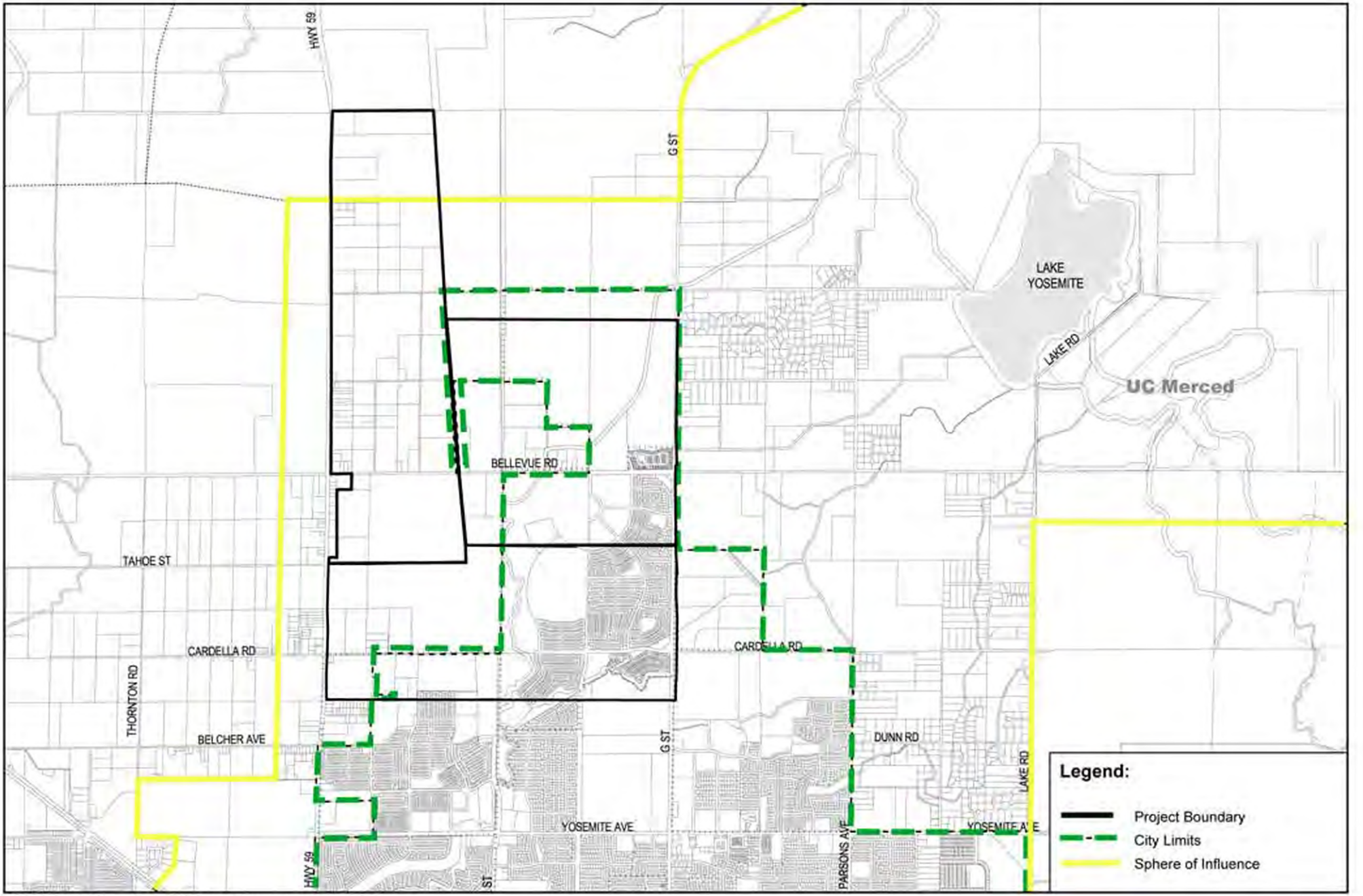
The Alternative 5 site (identified as the 2002 Proposed Project) comprises the area proposed for development in the UC Merced 2002 LRDP and 2004 UCP and consists of a 2,000-acre UC Merced Campus and an adjacent 2,133-acre University Community located in eastern Merced County, generally to the east and south of Lake Yosemite and bounded by Lake Road on the west and Yosemite Avenue on the south. The Campus and UCP sites under this alternative are included in the UC Merced/University Community SUDP. The Campus site is designated "UC Merced" and the site of the University Community is designated "Multiple-Use Urban Development" in the County General Plan. Existing and surrounding land uses on and in the vicinity of the Alternative 5 site are generally the same as those described above for Alternative 1.



SOURCE: EIP Associates - 2006, Merced County, Planning and Development - 2001

FIGURE **4.9-2**

Existing Sphere of Influence and SUDP Boundaries for Yosemite Avenue Alternative



SOURCE: Merced General Plan - 2007, Impact Sciences, Inc. - October 2008

FIGURE **4.9-3**

Existing Sphere of Influence and SUDP Boundaries for Bellevue Ranch Alternative

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4.9.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

The Proposed Action consists of the development of the campus and the University Community. Lands on which the campus would be built are or would be owned by The Regents of the University of California. As such, UC Merced is generally exempted by the state constitution from compliance with local land use laws and regulations. The University Community lands, on the other hand, are privately owned and are subject to local laws, regulations, and policies. This section summarizes relevant policies contained in the City and County general plans and programs that have been developed by the local municipalities to guide urban development while minimizing its environmental effects, especially on agricultural lands.

4.9.3.1 Merced County General Plan

The Proposed Action site is currently within unincorporated County. Therefore, under existing conditions, County policies would apply to the Proposed Action and are discussed below. The Merced County General Plan uses the Urban Centered Concept as its basic principle of land use policy. The Urban Centered Concept is directed at using cities and unincorporated communities or centers to accomplish expected urban expansion in an orderly manner, based on the ability of these communities to furnish public services along with land needs based on population demands and in balance with employment-generating land uses. Urban land uses include residential, commercial, industrial, and related institutional uses. The purpose of using the Urban Centered Concept to plan land use is to ensure that

- growth occurs in an orderly and logical manner,
- land is used efficiently,
- agricultural operations are not eliminated prematurely,
- the County's planning efforts are complementary to those of the cities, and
- urban development occurs where proper services are available.

The Urban Centered Concept is expressed through four area designations of the Merced County General Plan Land Use Diagram:

- The Specific Urban Development Plan (SUDP)
- The Rural Residential Center (RRC)
- The Highway Interchange Center (HIC)
- The Agricultural Services Center (ASC)

The SUDP is the broadest general plan boundary designation, intended to accommodate all classifications of urban land use. An SUDP boundary is recognized as the ultimate growth boundary of a community over the life of the general plan. Whenever land is added to an SUDP, the decision is made that the land will ultimately be converted to urban use (Merced County 1989). It is County general plan policy to maintain land use controls that protect agricultural and open space uses on all unincorporated lands within the SUDP until such time as the land becomes qualified for urban use (Merced County General Plan Land Use Element Policy 3.A.1).

Under the general plan, SUDP expansion is allowed after consideration of several factors, including the agricultural value of the land involved and impacts on adjacent agricultural and open space lands, urban service availability, the amount of vacant available land already within the community, and consistency of the expansion with local planning goals outlined through the community specific plan. The following Merced County General Plan policy and implementation measure under Land Use Objective 1.A relates to the expansion of an existing SUDP, as would be required for the proposed UCP (Merced County 2004).

Policy 2. Expansion of an existing urban boundary into areas designated for rural land uses shall be allowed only where deemed appropriate based on careful consideration of potential agricultural impacts, onsite limitations for development, public service availability, and impacts on open space or conservation values (Merced County 2004).

Implementation: The following criteria are to be applied during review of General Plan Amendment and/or Zone Change applications to expand SUDP, RRC, HIC, or ASC boundaries:

1. Soil: Is the soil suitable for agriculture according to the soil class? In general, unique or higher quality soil as identified on the Important Farmland Map of the state Mapping and Monitoring Program.

2. Parcel size: Is the present parcel a sufficient size for economic agricultural use? (in general, 20 acres or larger.)

3. Use: Is the land presently used, or has it been recently used, for agriculture? In general, for irrigated crop or intensive livestock production within the past three years?

4. Compatibility: Will a nonagricultural use create conflicts as to compatibility with adjacent agricultural uses? In general, at least half the adjacent land area is devoted to agricultural uses.

5. Services: Have provisions been made to provide adequate levels of public services to satisfy the demands generated by the proposed development?

6. Limitation: Will an individual waste disposal system contaminate the surface or groundwater table?

7. Safety: Will intensive use present hazards to public health, welfare, and safety, as identified in the Safety Chapter of the General Plan?

8. Natural Resources: Will urban use impact significant open space and/or conservation values as identified in the Open Space/Conservation Chapter (VI) of the General Plan?

9. Land Vacancy: Is there an adequate supply of available vacant land within the existing urban boundary to accommodate reasonably anticipated or historic growth needs over the next ten (10) years?

10. Consistency: Is the proposal consistent with the goals and policies of the Community Specific Plan if one has been adopted for the community or area?

The Merced County general plan includes Goal 11, which is specifically focused on the development of the campus and the orderly development of adjacent land uses. This goal is presented below:

GOAL 11: Accommodate the tenth University of California Campus and orderly development of adjacent land uses through a comprehensive planning process.

Objective 11.A: Land use designations supporting the University are identified for the Campus site and adjacent lands in a coordinated and organized manner involving land owners, the City of Merced, University of California, and the Merced Irrigation District.

Policy 1: The boundaries of the Virginia Smith Trust and Cyril Smith Trust properties shall be identified as "University Community SUDP". Lands within this boundary shall be designated "University Community Urban Reserve" until designated for specific urban uses.

Policy 2: The "UC Campus Study Area" boundary on the Land Use Policy Diagram is designated to serve as a broader area of analysis and evaluation during the interim University Community planning process.

Implementation: The County will prepare a specific plan or area plan for the University Community SUDP which will provide land use and development policies for the area and contain specific land use and zoning designations. A planning team will be formed for this effort involving representatives from Merced County, the University of California, City of Merced, landowners, and Merced Irrigation District.

Objective 11.B: Speculative development projects, re-zonings and General Plan Amendments determined to be detrimental to a coordinated development process for the University Community are discouraged.

Policy 3: Zoning within the University Community SUDP shall remain agricultural until planned for urban use through adoption of a General Plan Amendment.

Policy 4: General Plan Amendments, re-zonings and development projects within the UC Campus Study Area and along possible access routes, shall be denied if determined to be detrimental to the coordinated orderly development of the University Community SUDP.

Implementation: Within the UC Campus Study Area boundary which includes the University Community SUDP, the Planning Director shall review all applications for discretionary approvals. If the Planning Director determines that approval of the application could adversely affect the coordinated planning process of the University Community SUDP, the Planning Director shall refer the application to the Planning Commission. If the Commission concurs that the proposal could adversely affect a coordinated planning effort, it shall recommend to the Board of Supervisors that the application be denied or referred to staff with direction to either not process the application, or to work with the applicant to attempt to modify the application to address specific issues.

Objective 11.C: Access routes serving the University and adjacent land uses are appropriately classified to ensure adequate capacity.

Policy 5: Identification of all major access routes serving the University Community SUDP shall be included in all SUDP planning efforts, and appropriate amendments to the Circulation Chapter will classify these routes according to their proper function.

Policy 6: Development projects along possible access routes shall be located and designated in a manner which preserves the future capacity and aesthetics of the route to adequately serve the University Community SUDP.

Implementation: All applications for discretionary and non-discretionary projects located along possible access routes to the University Community SUDP will be reviewed for proposed building setbacks from existing and possible future rights-of-way. Consideration will be given to regional transportation planning efforts through MCAG (Merced County Association of Goverments), City of Merced Circulation Element amendments and other studies conducted by public agencies. Where a conflict is identified, all buildings should be set back further from the right of way, or application processing should be suspended until completion of the University Community transportation studies.

The County is in the process of updating its general plan. The document would update the information, assumptions and projections that were looked at in the Merced County General Plan that was completed in 1990. The general plan would incorporate information and policies from the Campus and University Community planning documents, as revised.

4.9.3.2 City of Merced Vision 2015 General Plan

Although the project site is outside the City of Merced at this time, the University Community would be subject to City general plan policies if the project site is annexed. The Campus entered a service agreement with the City to provide extra-territorial water service to the Phase 1.1 Campus site, including 102 acres of already developed property in 2003. Consistent with Section 56133 of the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000, extra-territorial service arrangements are allowed "in anticipation of a latter change in organization" such as an annexation. As part of the 2003 agreement, the Campus entered an annexation agreement with the City for Phase 1.1 and it is anticipated that additional extra-territorial service and annexation agreements may be pursued for the additional portions of the campus and community, particularly Community North.

In 2006, the City of Merced adopted Resolution 2006-89 that establishes the City's position regarding development of the University Community. According to this resolution, the University Community should be incorporated into the City, and the City accepts the University Community Plan adopted by Merced County in 2004 as general conceptual framework for planning and development of the site. The resolution adopted by the City Council further states that "the City should revise all of its various planning documents to accommodate the incorporation of the University Community into the City of Merced. These include not only the General Plan, but also plans for wastewater treatment, water, storm drainage, parks, fire protection, and other services." Consistent with this resolution, the City is planning to include the Campus and the University Community within its SOI when it adopts an update to its general plan in 2009.

Merced City Council approved a Draft Land Use Diagram and Sphere of Influence, including the Campus and University Community, for the purpose of preparation of the draft general plan document and Draft EIR, in February 2008. It is anticipated that the Campus and University Community project proponents would formally request that the City reflect the annexation process in the draft general plan Draft EIR in a response letter for the Notice of Preparation. Therefore, this EIS/EIR assumes that the City's updated general plan and associated environmental review documents would be consistent with the Proposed Action.

At this time, however, the City of Merced's Vision 2015 General Plan is the prevailing planning document in the City. Therefore, relevant City of Merced general plan policies and actions are listed in this section. Furthermore, the City of Merced's Vision 2015 General Plan contains policies and implementing actions that would be relevant to Alternative 3, Bellevue Ranch, as this alternative would be located within the existing City of Merced SUDP.

UE-1.4: Establish Joint City-County Planning Program on the UC San Joaquin (Merced) Site and Smith Trust Lands.

Implementing Actions

1.4.a: Incorporate the UC San Joaquin (Merced) campus area and adjacent lands owned by the Cyril Smith and Virginia Smith Trusts as part of the City's SOI. This designation would permit the City to provide services to these areas in the future and would facilitate incorporation of the campus into the City if this is determined to be appropriate at a later date. This designation would also require, by state law, that the City be notified of any development proposals in the area and be given a chance to comment on such proposals.

1.4.b: Participate in cooperative planning of UC San Joaquin (Merced) and its surrounding lands. The City will participate with the University of California, the County of Merced, other public agencies, the Cyril and Virginia Smith Trusts, and other land owners in planning of the campus and its surrounding areas. Issues will include the timing of development relative to the UC construction, transportation access to the site, extension of urban services to the site, and possible future annexation to the City of Merced.

1.4.c: Work closely with the University of California and the County of Merced in development of the UC San Joaquin (Merced) Campus Plan and provide assistance in the expansion of infrastructure to service the site as required. City staff will provide technical support to campus planners in the coordination of infrastructure expansion to serve the site. Areas to be addressed will include, but are not limited to,

a. extension of public transit service to the site;

b. provision of sewer and water to the site as required;

c. development of public protection facilities and expansion of public protection services to the site as necessary;

d. coordinated development of site access streets, public transportation systems, etc., as required, and

e. cooperate in the development of other necessary campus support facilities, such as flood control and drainage facilities, extension of power, gas and telecommunications infrastructure, etc.

UE-1.2: Promote a Compact Urban Form.

Implementing Actions

1.2.c Continue to limit the expansion of City utilities to only those within an established urban expansion boundary. Proposals for urban development within the City's SUDP shall be considered only after annexation has taken place. To be eligible for annexation, a property must be contiguous to the City Limits and be located within the SUDP. City utilities should not be extended outside of the City limits except in cases where public health and safety are threatened or a significant public interest (such as the UC Campus) is served.

4.9.3.3 Merced County Local Agency Formation Commission

Each county in California has its own LAFCO, in accordance with Section 56001 of the Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 (CKH), the state statute governing the organization and reorganization of governmental entities. Each LAFCO is intended to encourage orderly growth and development essential to the social, fiscal, and economic wellbeing of the state. A primary goal of the CKH is to encourage orderly development patterns by discouraging urban sprawl and preserving open-space and prime agricultural lands (Merced County 2004).

Pursuant to the CKH, LAFCOs have the specific authority to review the following actions:

- Annexations to, or detachment from, cities or districts
- Formations or dissolution of districts
- Incorporation or disincorporation of cities
- Consolidation or reorganization or cities and districts
- Establishment of subsidiary districts
- Development of, and amendments to, spheres of influence

Each of these actions is called a "change of organization" under the CHK. For the provision of utilities and public services, the Proposed Action site would be annexed into the City, subject to approval by the Merced County LAFCO. As described in detail later in this section, this annexation is contingent upon approval of the City's request to expand its SOI boundaries to include the project site and the prezoning of the site by the City.

The following major steps would be involved in the annexation process:

- Filing of an application with LAFCO by the land owner or the city
- Issuance of certificate of filing deeming the application complete
- Public hearing before LAFCO
- Resolution Making Determinations (i.e., the LAFCO decision)
- Possible Reconsideration Hearing
- Protest Hearing (for landowners or and residents)
- Election (if sufficient protests are filed)
- Certificate of Completion

The annexation process varies, depending upon whether the territory is "inhabited" by twelve or more residents (in which case the residents have the right to protest and vote on the annexation) or "uninhabited" (in which case the affected landowners have the applicable protest and voting rights). The Proposed Action's consistency with LAFCO policies related to annexation is evaluated in the section below. Also, in the event that the project site is not annexed and is instead served by a special district or districts, the Proposed Action's consistency with LAFCO criteria related to changes to and/or formation of new service districts is also discussed below.

4.9.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Although Council on Environmental Quality (CEQ) regulations (40 CFR 1508.27) provide guidance as to the requirement to evaluate impacts in an EIS, CEQ guidance generally does not identify the specific categories of impacts that must be evaluated not does it specify the significance criteria to be used to evaluate the significance of the specific impacts of the proposed action. Under the National Environmental Protection Act (NEPA), impacts must be identified based on the potential environmental consequences of the proposed action. Further, "significantly" as used in NEPA requires considerations of both context and intensity. Context means that the significance must be analyzed in several contexts, such as the human environment, affected region, affected interests, and the local setting. Additionally, "intensity" refers to the severity of the impact. Impacts must be evaluated that may be both beneficial and adverse.

For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance

with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14).

For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this EIS/EIR, land use impacts would be significant if implementation of the Proposed Action or its alternatives would

- conflict with any applicable habitat conservation plan or natural community conservation plan;
- physically divide an established community;
- conflict with applicable land use plan, policy, or regulation or an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- result in land use designations that could result in incompatible land uses; or
- be inconsistent with LAFCO Guidelines for annexation and revisions to/formation of special districts.

4.9.4.1 Issues Not Discussed Further

Several years ago, Merced County began preparing a Natural Community Conservation Plan/Habitat Conservation Plan for eastern Merced County. The planning effort was however discontinued. There are no habitat conservation plans or natural community conservation plans that are applicable to the project site or the sites of the alternatives. Therefore, implementation of the Proposed Action and its alternatives would not conflict with any applicable habitat conservation plan or natural community conservation plan and this issue is not addressed any further in this EIS/EIR. The Proposed Action includes a conservation strategy for the protection of special-status plant and wildlife species that would be affected by the Proposed Action. This conservation strategy was developed to comply with the 2002 Biological Opinion issued by the US Fish and Wildlife Service under Section 7 of the Endangered Species Act.

4.9.5 METHODOLOGY FOR EVALUATING EFFECTS

Land use-related impacts would result if development under the Proposed Action (or alternative), or development that would occur as a result of the Proposed Action, would physically divide an existing community, or conflict with adopted plans or policies. These impacts were evaluated by comparing proposed changes in existing land use characteristics to the significance thresholds above. If the Proposed Action would result in changes to existing land use conditions that conflict with a significance threshold, the Proposed Action (or alternative) was determined to result in a significant land use impact.

4.9.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.9.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact LU-1: Implementation of the Proposed Action would not physically divide an established community. (*No Impact*)

Campus and Community

Grazing lands surround the project site. Since the site is located on the periphery of existing development, the Proposed Action would not physically divide an established community. As the Proposed Action would not physically divide a community, the proposed development would not adversely impact the human environment from a NEPA perspective. Other effects to the human environment due to air, noise, traffic and other environmental factors are addressed elsewhere in this document. No impact on an existing community would occur.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact LU-2: Implementation of the Proposed Action would not conflict with the Merced County General Plan land use designations or policies. (*Less than Significant*)

In 2000, the University proposed the location of a 910-acre campus adjacent to Lake Yosemite in the eastern portion of Merced County and in 2002 certified an EIR approving the campus at that location. In 2004, the County approved a General Plan amendment that authorized a modification of the existing UC Merced SUDP to encompass an area to the south of the campus for the establishment of a University Community that would accommodate the population associated with the campus by providing the needed housing and other community services. Since that time, following consultation with the resource agencies, the University has proposed a revision to the location and footprint of the campus. With the shift in the location of the campus, a revision to the footprint of the University Community has also been proposed to encompass an area to the east of the previously proposed University Community. The potential for the revised Campus and University Community to conflict with the County's general plan is evaluated in the analysis below.

Campus

As the campus site is owned or will be owned by the University, the Long Range Development Plan is the plan that regulates the campus. Since the revised development plan for the campus is the subject of this

EIR/EIS, any environmental consequences of the revisions to the LRDP are addressed in the other sections of this document.

The campus site is located within the unincorporated part of the County, with the northern part of the campus site is located within the City's SOI. Because the University is a state entity, there is no municipal jurisdiction over the Campus. Nevertheless, the University has reviewed the County's land use plans and policies because it is interested in coordinating the development of the proposed campus with the beneficial planning efforts of the County and in responding to the County efforts to reach its planning goals, where feasible. Based on a review of the County general plan, the Campus as proposed would be in substantial conformance with the County general plan, since the plan identifies the campus site as part of the SUDP, a designation that anticipates the future development of the campus. In addition, the SUDP boundary could be reduced to reflect the reduced size of the campus. In summary, the development of the campus would not conflict with any applicable land use plan. This impact is considered less than significant.

University Community

In 2004, following the certification of the UCP EIR, the County amended the County general plan to designate the area of the University Community as Multiple-Use Urban Development and revised the boundaries of the UC Merced/University Community SUDP to include the 2004 UCP area.

The majority of the University Community (as now approved) is within the UC Merced/University Community SUDP boundary that was established in 2004. Under the Proposed Action, the area of Community South would remain the same as it was under the 2004 UCP. Therefore, no change to the SUDP boundary in the area of Community South is necessary. The Community South is designated Multiple-Use Urban Development in the County general plan. No change to that designation is needed at this time. Therefore, the Community South would not conflict with the County general plan.

However, under the Proposed Action, the northern and eastern boundary of the SUDP would be modified to remove 180 acres from the UC Merced Campus area and add approximately 222 acres of land located in the eastern portion of Community North. The County's planning process requires that any modification to an SUDP boundary must be first evaluated for consistency with the County general plan goals or policies. The determination of consistency with the County's general plan can only be made by the Board of Supervisors. In addition, prior to modification of the SUDP boundaries, if the boundary change involves conversion of agricultural land, the Board must approve a statement of findings that the benefits of the conversion of agricultural land outweigh the impacts of conversion. The County general plan includes 10 criteria pertaining to the modification of an SUDP boundary for consideration by the

Board of Supervisors prior to their approval. The proposed SUDP boundary change is evaluated below relative to these criteria.

Soil Criteria

As described in detail in **Section 4.2, Agricultural Resources**, the University Community area contains soils suitable for agriculture, including Prime Farmland that is currently cultivated. However, the additional area that would be added to the UC Merced SUDP does not contain soils that unique or higher quality soils, and the area currently contains mainly irrigated pasture and grazing lands.

Parcel Size Criteria

The area that would be added to the SUDP is approximately 222 acres and is of sufficient size to support economic agricultural use.

Use Criteria

The area is presently used for grazing. However, it is not used for irrigated crops. Therefore, the SUDP boundary change would not involve the conversion of highly productive agricultural land.

Compatibility Criteria

The area to be added to the SUDP is not flanked by lands in active agricultural use; the adjacent lands are open space, rangeland used for grazing. Development with urban uses will not create any conflicts with adjacent uses or agriculture.

Services Criteria

The UCP includes Policies IW 2.1 and IE 1.1 to ensure the provision of adequate services. Further, because any future development would require an additional approval, the County would evaluate each project to ensure the availability of adequate services. The County would also be able to determine if proposed improvements, such as wastewater systems, would be feasible given physical constraints in an area.

Limitation Criteria

The UCP includes Policies IW 8.3 and 8.4 to ensure that wastewater collection and treatment system(s) are designed and constructed to protect groundwater and surface water from contamination by wastewater and that wastewater treatment levels meet standards for intended reuse or discharge point.

Safety Criteria

As discussed in **Section 4.7, Hazardous Materials and Public Safety**, development of the University Community would not present hazards to public health, welfare, and safety.

Natural Resources Criteria

As discussed in **Section 1.0, Introduction,** the boundaries for the Campus were revised and the location shifted in response to input from the agencies and public concern regarding the potential impacts on vernal pools and biological resources on the original 2,000-acre campus site. This change in campus location entailed a corresponding relocation of the adjacent Community North site. The development of the Proposed Action would remove 180 acres from the UC Merced urban designation and add these 222 additional acres to urban uses. However, this area is not used for recreation. Development within the University Community would result in some habitat loss, as discussed in **Section 4.4, Biological Resources.** As discussed further in **Section 4.4**, the potential loss of biological resources in the proposed expansion area would not be substantial because a substantial part of the 222-acre area is already disturbed by the irrigation pivot and contains biological resources that are potentially of lesser value than the higher quality resources that would be avoided within the removal of about 180 acres of land from the footprint of the campus. Furthermore, all impacts to biological impacts are reduced with the mitigation measures proposed for the project.

Land Vacancy Criteria

Because of constraints on development in the existing SUDP area due to the presence of biological resources, presented in **Section 4.4** of this EIR/EIS, there would not be adequate space within the existing SUDP boundary to accommodate the University Community uses and the additional acreage is needed.

Consistency Criteria

There is currently no specific plan that has been adopted for the SUDP. The UCP includes policies that require the preparation of specific plans consistent with the policies in the UCP and the County general plan. The proposed change to the UCP is substantially consistent with the SUDP expansion policies in the general plan; however, the determination of consistency with the County general plan would be made by the Board of Supervisors.

In addition to the proposed change in SUDP boundary along the eastern boundary of Community North, UCLC has developed a land use plan for the development of Community North. The consistency of the proposed Community North land use plan with the previously adopted UCP will be evaluated by the

County. It is anticipated that some aspects of the proposed development in Community North would not be consistent with certain policies contained in the UCP. However, the areas where the Community North Land Use Plan differs from the previously adopted UCP do not result in a conflict with the objectives of the County with respect to the UCP which are for development of a sustainable and viable community that advances the goals, objectives and policies of the County's General Plan, including preservation of agricultural resources and the enhancement of the County's economic base and also supports the development of the campus. Furthermore, it is anticipated that the County would prepare and circulate a separate EIR to evaluate the environmental impacts of adopting the revised UCP that will encompass both Community North and Community South, and approving a general plan amendment related to the revised UCP. In summary, although some changes to the UCP are required to accommodate the changes in the land use planning for the northern portion of the University Community, these changes do not represent a significant conflict with the existing land use plan for the area. The impact would be less than significant.

Conclusion

For reasons presented above, the combined effect of the development of the Campus and the University Community would also be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact LU-3: Implementation of the Proposed Action would not conflict with the City of Merced General Plan land use designations or policies. (*Less than Significant*)

As discussed above, if the University Community is annexed into the City of Merced, the City policies would apply to the University Community site. The potential for the revised Campus and University Community to conflict with the Merced's Vision 2015 General Plan is evaluated in the analysis below.

Campus

As discussed above, because the University is a state entity, there is no municipal jurisdiction over the Campus. Nevertheless, the University has reviewed the City's land use plans and policies and determined that the campus as proposed would not conflict with the land use policies of the City. The City of Merced's Vision 2015 General Plan states that the future of Merced includes the 10th University of California campus. Even though a portion of the campus site would extend outside the current SOI, the level of development associated with the campus would be the same as previously proposed in 2002 and therefore consistent with the City's planning efforts. The impact would be less than significant.

University Community

In 2006, the City Council adopted Resolution 2006-89 establishing the City's position regarding the development of the University Community (City of Merced 2006). In this resolution, which is itself proposed for inclusion in the updated general plan that is under preparation, the City proposes to annex the University Community through the use of annexation agreements, "not through the creation of a County services district, either as an interim or permanent measure." The policy states that the City should revise all of its various planning documents to accommodate the incorporation of the University Community into the City of Merced, specifically its general plan. The City is currently updating its general plan, which is expected to be adopted in early to mid 2009. The UC and the UCLC are working with the City to ensure that its general plan update, and associated CEQA document, recognize the proposed revisions to the Campus and University Community. Therefore, the City will ensure that its general plan, when updated, contains policies and implementing actions necessary to realize the proposed University Community.

Until the updated general plan is adopted, the Merced Vision 2015 General Plan is the relevant document. While the University Community site is not currently a part of the City's general plan, the policies within the UCP do not conflict with the Merced Vision 2015 General Plan. The impact would be less than significant.

Conclusion

For reasons presented above, the combined effect of the development of the Campus and the University Community would also be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact LU-4: Implementation of the Proposed Action would not result in land use designations that could result in incompatible land uses. (*Less than Significant*)

Campus and Community

The land use plans of the Campus and University Community have been developed in a coordinated manner and if the land uses are developed as proposed, incompatible land uses would not be placed adjacent to each other within the project site. With respect to potential conflicts of proposed land uses with adjacent agricultural land uses, those conflicts are evaluated in **Section 4.2, Agricultural Resources.** As the analysis in Impact AG-2 shows, with the implementation of UCP policies, potential conflicts with

active farming operations adjacent to the University Community would be avoided. With respect to rural residential land uses along the west side of Lake Road, a green belt is planned between Campus Parkway and Lake Road within the Campus and University Community in this area which would help avoid impacts on the existing homes, especially from traffic noise along Campus Parkway (see **Section 4.10, Noise**). Therefore, the Campus and University Community development would not result in placement of incompatible land uses near the homes along Lake Road. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact LU-5: Annexation of the Proposed Campus and University Community would not conflict with Merced County LAFCO policies. (*Less than Significant*)

Campus and Community

As described above, both the Campus and the University Community may be annexed to the City of Merced in the future in order to receive certain City utility services, including water, sewer, and fire protection in the case of the Campus, and water, sewer, stormwater, law enforcement, and fire protection in the case of the University Community.

Both the Campus and University Community under the Proposed Action are currently located within unincorporated portions of Merced County. The northerly portion of the campus site, including the Phase 1.1 Campus, is within the City's SOI. State law permits the City, with LAFCO approval, to provide municipal services beyond its jurisdictional boundary, but within its SOI, in anticipation of a later change of organization. In accordance with this authority, in 2003, the City and the Campus executed an extraterritorial services contract pursuant to which the City provides water and sewer service to the Phase 1.1 Campus in anticipation of the Phase 1.1 Campus' subsequent annexation to the City. This contract, however, does not provide for the extension of City water and wastewater service to the remainder of the campus. Furthermore, under the existing agreement, fire service is currently not provided to any portion of the campus (It is provided by the County with additional assistance provided by the City Fire Department as needed and when requested by the County).

In order for the Campus and University Community to receive the full compliment of City municipal services (i.e., water, sewer, and fire protection services in the case of the Campus, and water, sewer, stormwater, police and fire services in the case of the University Community), both the Campus and the University Community could be annexed to the City at some point in the future. In 2006, the City Council adopted Resolution 2006-89, which, among other things, establishes a policy promoting the City's future annexation of the University Community and directs City staff to revise the City's planning documents to accommodate this change of organization. Resolution 2006-89 also sets forth City policy opposing the

creation of a community services district established to provide urban services to the University Community as an alternative to formal annexation.

Although the University has determined that the campus site would likely be annexed to the City, the City also recognizes that the annexation process for the campus site may not occur prior to development of the next phase of the campus. Accordingly, the University and the City are expected to execute a pre-annexation agreement pursuant to which municipal services, including fire protection, would be extended to the next phase of campus development. Pursuant to such pre-annexation agreement, the City would provide interim sewer, water and fire protection services to the campus, provided that these interim services comply with applicable law and sound planning practices. In addition to setting forth the terms of the City's provision of long-term municipal services to the campus, the pre-annexation agreement would include an enforceable commitment to pursue annexation, and financial commitments necessary to refund long-term service costs following annexation (City of Merced Resolution 1997).

Change in City SOI

Pursuant to the CKH, land to be annexed to a city must first be included that City's SOI. The City is currently in the process of updating its general plan and is revising its SOI boundaries to incorporate the footprint of the Campus and University Community. The City will apply to LAFCO for a SOI amendment once the General Plan Update is adopted, currently anticipated in Spring 2009.

Prezoning Requirement

Section 56375(a) of the CKH states that a LAFCO must require, as a condition to any annexation, that a city "prezone" the territory to be annexed. Pursuant to the CHK, any LAFCO determination with regard to a proposed annexation must be based on the annexing city's general plan and prezoning policies. Nevertheless, the approved prezoning does not become legally operative until the proposed annexation has been approved and completed. Consistent with the CKH, and as required under the City and Urban Service District Annexation Policies, the proposed Campus and University Community would be prezoned by the City as part of the annexation process and either prior or subsequent to LAFCO's adoption of the City's updated SOI.

Contiguity

Section 56741 of the CKH generally prohibits the annexation of territory to a city "unless it is contiguous to the city at the time the [annexation] proposal is initiated." The Merced County LAFCO also requires that annexation boundaries should form a logical and efficient urban development pattern. The proposed project site is separated from the City's existing boundaries by a wide strip of land running down and

extending westerly of Lake Road to G Street. Thus, to secure annexation of the Campus and University Community, LAFCO would first (or simultaneously with the project annexation) be required to complete the annexation of some portion of these intervening properties to create contiguity between the City's boundaries and the project site. The intervening properties between the City and the project site are currently in the City's SOI.

Annexation Process

For the provision of utilities and public services, the Proposed Action site could be annexed into the City, subject to approval by the Merced County LAFCO. As noted above, this annexation is contingent upon approval of the City's request to expand its SOI boundaries to include the project site and the prezoning of the site by the City.

It is anticipated that the Campus and Community North would connect to the City via the Bellevue corridor. Other areas near Community South would remain outside City limits until such time that those areas are ready for development.

Consistency with LAFCO Policies

The annexation of the project site is subject to CEQA. For purposes of this analysis, it is assumed that required annexation will be pursued by the City and that the environmental impacts of this annexation will be addressed in the EIR prepared for the City's general plan update. Nevertheless, to assist the City and LAFCO in this process, the University has evaluated the consistency of the Campus and University Community land uses and policies with relevant LAFCO policies. Although, the ultimate determination of consistency with the LAFCO policies would be made by LAFCO, as **Table 4.9-1** (at the end of this section) shows, both the Campus and University Community would be substantially consistent with the relevant LAFCO policies relating to the expansion of the SOI or annexation.

LAFCO's policies specifically address the preservation of Prime Farmland. Other criteria that could be considered by LAFCO include phasing to avoid premature conversion of farmland; demonstration in the County General Plan for the present and probable need for the provision of public facilities and community services; contiguity with existing district boundaries (as noted above); and proximity to existing developed or developing areas within the SUDP.

LAFCO Agricultural Policy 2 is intended to direct growth away from large concentrations of prime agricultural land, although the policy recognizes that some conversion of Prime Farmland could be inevitable. Although the Proposed Action would result in the loss of Important Farmland, as discussed in **Section 4.2, Agricultural Resources**, annexation of the Campus and Community would ultimately assist

in directing growth related to the Campus and Community in a more orderly and efficient development pattern.

LAFCO Sphere of Influence Revision Objective II.A requires the creation of an urban land use pattern in the City that provides adequate areas for growth while ensuring delivery of services. Annexation of the Campus and Community would result in an urban land use pattern that provides for adequate areas for growth, while facilitating the Proposed Action's ability to access City urban services, rather than having to develop its own full set of stand-alone service facilities.

LAFCO City and Urban Service District Annexation Objective III.A requires that City annexations reflect a planned, logical and orderly progression of urban expansion and promote efficient delivery of urban services. Annexation of the Campus and Community would result in a planned, logical and orderly progression of the City's expansion towards the east. Annexation would also ensure the Campus and Community have efficient access to water, sewer, and fire protection (for the Campus), and water, sewer, stormwater, law enforcement, and fire protection (for the University Community).

LAFCO City and Urban Service District Annexation Policy 4 specifies that public services shall be available to all annexed land in an efficient and orderly manner. As discussed in **Section 4.11, Public Services and Recreation**, adequate public services are currently available for the Campus and Community, including law enforcement and fire protection services. As discussed in **Section 4.14, Utilities and Service Systems**, adequate water and wastewater services are also currently available for the Campus and Community. Finally, as described in **Section 2.0, Project Description**, the University Community would be served by the City's wastewater collection and treatment system.

As described above, the Proposed Action would be substantially consistent with the relevant LAFCO policies relating to the expansion of spheres of influence or annexation. However, the ultimate determination of consistency with LAFCO policies must be made by LAFCO.

Conclusion

For reasons presented above, the combined effect of the development of the Campus and the University Community would also be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact LU-6: Development of Special Districts to provide urban services to the Proposed Action would not conflict with Merced County LAFCO policies. (*Less than Significant*)

Campus and Community

As noted earlier, Phase 1 and 2 of the Campus are expected to be annexed to the City. With respect to the rest of the Campus and all of the University Community, annexation may or may not happen. In the event that the area of the campus outside of Phases 1 and 2 and the entire University Community are not annexed, special districts will have to be established or existing districts would need to be revised in order to provide urban services to these areas. LAFCO approval of these new or revised districts would be required.

LAFCO Urban Service District Sphere of Influence Revision Policy 1 includes five criteria that will be applied to any urban service district sphere of influence boundary revisions or creation of new districts.

The first criterion asks whether the County general plan identified the sphere of influence boundary and all planned land uses in the SUDP. The 2009 LRDP identifies all planned land uses within the campus site and likely service providers. Similarly, the proposed revised UCP identifies planned land uses within the University Community area and service providers that may provide services to the University Community.

The second criterion addresses phasing. The 2009 LRDP includes phasing of development but the phasing does not relate to avoiding premature conversion of farmland because except for small patches which are not being farmed, the campus site does not include any Important Farmland. The proposed revised UCP contains policies regarding phasing to ensure that agricultural land is not prematurely converted.

The third criterion asks if there are local policies that address the timing of conversion of prime soil. The 2009 LRDP does not contain any provision related to that for the reason presented above. County general plan Agricultural Policy 2.A under Goal 2 directs development to less valuable farmland when conversion is justified. UCP Policies LU 2.3 through LU 2.6 in the proposed revised UCP direct initial phases of growth to the grazing lands to the north, before any development is allowed in the prime farmland on the southern portion of the University Community. In addition, the configuration of the University Community avoids lands south of Yosemite Avenue, which are predominantly prime farmlands. However, even with these policies, loss of some prime farmland would occur. As stated above, the presence of prime farmland within a proposed SOI or service district does not necessarily, however, eliminate consideration by LAFCO.

The fourth criterion asks if the general plan or community specific plan demonstrates the provision of public facilities and services. The 2009 LRDP discusses the types of infrastructure that will be needed to serve the campus. UCP Policies IW 1.1 and IW 1.2 require that infrastructure is sufficient to meet the needs of the community and that an adequate water supply is demonstrated prior to approving new development. UCP Policy IW 1.8 requires that there is adequate wastewater treatment and conveyance capacity to accommodate planned development. Policy IW 11.5 requires that, if necessary, the wastewater systems include a connection to the City of Merced or other municipal wastewater treatment system for discharge of wastewater. The sequence, timing, and cost of providing these services would be determined at the time a specific plan is proposed within the University Community area.

The fifth criterion asks if the plan identifies any social or economic communities of interest in the planning area that may affect the boundaries of the proposed sphere of influence. The UCP identifies service providers that could serve development within the University Community. Whether the services will be provided by existing service providers or if services, such as wastewater treatment, would be provided on site will be determined as the planning for the University Community moves forward.

In summary, the 2009 LRDP as the plan for the development of the campus and the proposed revised UCP would be substantially consistent with the LAFCO policies relating to the expansion of spheres of influence or urban service district boundaries. The impact related to this criterion would be less than significant.

Mitigation Measure: No mitigation is required.

4.9.6.2 Alternative 2 – Yosemite Avenue

Physically Divide a Community

Alternative 2 would not divide an established community because like Alternative 1, Alternative 2 is located on the edge of the existing community. The County approved the Campus Parkway project that would construct a roadway through the Community South portion of the Yosemite Avenue site. However, any specific plans and policies pertaining to this portion of the University Community would be developed at a later time and would anticipate construction of this roadway. Therefore, Alternative 2 would not physically divide a community.

Conflict with Merced County General Plan

Similar to Alternative 1, Alternative 2 would also require a change in SUDP boundary. However, in the case of this alternative, the change in the SUDP boundary would be associated with Community South.

More importantly, the change in the boundary would be associated with adding approximately 1,187 acres of land located south of Yosemite Avenue to the SUDP (compared to 222 acres that would be added under Alternative 1, Proposed Action). This change in SUDP area and boundary was evaluated against the 10 County general plan criteria pertaining to the modification of an SUDP boundary. The analysis shows that this modification to the SUDP would not be consistent with the County general plan for the following key reasons. The area contains soils highly suitable for agriculture, including a substantial acreage of Prime Farmland that is currently cultivated. The area is of sufficient size to support economic agricultural use. Furthermore, the area is presently used for irrigated crops and is flanked by lands in active agricultural use. Development with urban uses could create conflicts with adjacent agricultural uses. This alternative would therefore conflict with the general plan. The impact would be a substantial adverse effect under NEPA and significant under CEQA.

Conflict with City of Merced General Plan

Similar to Alternative 1, Alternative 2 would also not result in a conflict with the City of Merced's adopted general plan because the campus is anticipated in that plan (regardless of exact location) and the UCP policies do not conflict with the City general plan policies. The impact will be less than significant.

Result in Incompatible Land Uses

Similar to Alternative 1, the development of the campus and University Community under this alternative would not result in placement of incompatible land uses adjacent to each other. Similarly, conflicts with adjacent agricultural and rural residential uses would be avoided or minimized by the UCP policies cited above for Alternative 1. Although the potential for conflict with farming operations would be greater as a larger portion of Community South under this alternative would be adjacent to lands under active farming, UCP policies would adequately mitigate this impact.

Conflict with LAFCO Policies for Annexation

Similar to Alternative 1, this alternative would also need water, sewer, and other city services from the City of Merced to be provided to the Campus and University Community, which could require annexation. However, LAFCO approval of this alternative would be harder to achieve because of the higher proportion of Prime Farmland involved. As such, LAFCO may determine that annexation related to this alternative is inconsistent with LAFCO's policies. For these reasons, this is considered a potentially significant impact. In summary, this alternative would be similar to the Proposed Action in most respects except that it is likely that a change in SUDP boundary to encompass the lands south of Yosemite Avenue would likely be found by the County to be inconsistent with the County general plan because of the conflict of this alternative with key criteria.

Conflict with LAFCO Policies for Creation of Special Districts

Similar to Alternative 1, in the event that the Yosemite Avenue site is not annexed to the City of Merced, revisions to existing service district boundaries and/or the establishment of new service districts would be necessary in order to provide water, wastewater, fire and police services to the remainder of the campus (outside of Phases 1 and 2 of the Campus) and all of the University Community. While similar to Alternative 1, the plans for the development of the campus and University Community would not conflict with the five criteria used by LAFCO for revisions to or establishment of special districts, it is considered likely that LAFCO would find this alternative to be inconsistent with some of the criteria because of the much higher acreage of prime farmland within the footprint of this alternative. Therefore, there likely would be a significant impact relative to this impact standard.

4.9.6.3 Alternative 3 – Bellevue Ranch

Physically Divide a Community

Under this alternative, the Campus and University Community would displace existing and planned residential and commercial uses. As noted earlier, a specific plan has been approved for the development of the Bellevue Ranch site and some housing developments have been constructed along G Street both north and south of Bellevue Road. Please refer to **Section 4.12, Socioeconomics/Environmental Justice/Population & Housing,** for a discussion of displacement of population and housing under this alternative. Although Alternative 3 would displace residences, the site is located near the periphery of the urban boundary of the City of Merced. The area surrounding the proposed area for Alternative 3 is under agricultural uses. Therefore, the alternative would not physically divide a community because there are no established communities to the north, east and west of the site. This is considered a less than significant impact.

Conflict with Merced County General Plan

Alternative 3 is composed of properties that are located within the City of Merced SUDP and some properties that are in unincorporated County. Under Alternative 3, the northern boundary of the City of Merced's SUDP would be modified to encompass the northern portion of Community North. The City is undergoing an update to its general plan that would revise the existing City SUDP and SOI boundaries to include the entire Community North site as proposed under Alternative 3. However, should that action by the City not proceed, approval of Alternative 3 would require a change to the City's SUDP before the northerly portion of Community North can be developed. This change in SUDP area and boundary was evaluated against the 10 County general plan criteria pertaining to the modification of an SUDP boundary. The analysis shows that this modification to the SUDP would be similar to the modification

under the Proposed Action and would not be in substantial conflict with the County general plan for the reasons presented below.

Similar to Alternative 1, the University Community area contains soils suitable for agriculture, including Prime Farmland that is currently cultivated. Therefore, the area to be added to the SUDP could contain soils that are unique or of high quality. The area is of sufficient size to support economic agricultural use. The site is presently used for grazing and row crop production. The development of the UCP would place future project residents adjacent to ongoing agricultural activities. Adherence to UCP Policies A 1.2, 1.3, and 3.1 would be required to minimize these conflicts. The Alternative 3 site is flanked to the east, south and west by existing farmlands that are considered Important Farmland. Existing County and City regulations would be implemented to reduce pressure to convert these uses to non-agricultural activities. Similar to Alternative 1, implementation of UCP Policies IW 2.1 and IE 1.1 would be required to ensure the provision of adequate services. Further, because any future development would require an additional approval, the County would evaluate each project to ensure the availability of adequate services. Similar to Alternative 1, implementation of UCP Policies IW 8.3 and 8.4 would be required to ensure that wastewater collection and treatment system(s) are designed and constructed to protect groundwater and surface water from contamination by wastewater and that wastewater treatment levels meet standards for intended reuse or discharge point. Similar to Alternative 1, development of the University Community at this location would not present hazards to public health, welfare, and safety. The development of the University Community would convert these 1,951 additional acres to urban uses. However, this area is not used for recreation. Development within the University Community would result in impacts associated with some habitat loss, including impacts to vernal pools, and impacts to special status plants and birds species, as discussed in **Section 4.4, Biological Resources.** All of the additional land that would be added to the City of Merced SUDP under this alternative is needed for the development of the University Community. This alternative would therefore conflict not with the County general plan. The impact would be less than significant.

Conflict with City of Merced General Plan

The location of the Campus and University Community at the Bellevue Ranch site is not anticipated by the City and would conflict with the existing general plan land use designations of this site. Implementation of Alternative 3 would require a City of Merced general plan amendment to change the existing land use designations that include open space/recreation, low- and low-to-medium density residential uses to designations appropriate for the Campus and University Community. The environmental consequences associated with changes to the City's general plan are addressed in the environmental topics in this EIR/EIS. The primary impact would be displacement of previously approved land uses at this site and the need for the City to designate additional land in other parts of its SOI to

absorb the displaced uses. This could lead to development beyond the SOI boundaries that are not anticipated by the City. For these reasons, this is considered a potentially significant impact. No mitigation is available to address this impact and therefore this impact of Alternative 3 would be significant and unavoidable.

Result in Incompatible Land Uses

Similar to Alternative 1, the development of the campus and University Community under this alternative would not result in placement of incompatible land uses adjacent to each other. Similarly, conflicts with adjacent agricultural and rural residential uses would be avoided or minimized by the UCP policies cited above for Alternative 1. The impact would be less than significant.

Conflict with LAFCO Policies for Annexation

As discussed above, Alternative 3 is composed of properties that are located within the City of Merced SUDP and some properties that are in unincorporated Merced County. Notably, a specific plan has already been approved for the development of the Bellevue Ranch site. Annexation of properties outside of the City's SUDP could be necessary for the extension of urban services to those properties. This annexation would be consistent with LAFCO's policies because of the minimal amount of Important Farmland within the portion of the Bellevue Ranch site that would be annexed, and because annexation would ensure the efficient delivery of services to development that would be located on that site. For these reasons, this impact would be less than significant.

Conflict with LAFCO Policies for Creation of Special Districts

Similar to Alternative 1, in the event that in the event that the small area of the Bellevue Ranch site that is not within the City of Merced city limits or SOI is not annexed, revisions to existing service district boundaries and/or the establishment of new service districts would be necessary in order to provide water, wastewater, fire and police services to this area. Because of the small area involved, the plan for the development of this area with Community North facilities would not conflict with the five criteria used by LAFCO for revisions to or establishment of special districts. The impact would be less than significant.

4.9.6.4 Alternative 4 – 2002 Proposed Project

Physically Divide a Community

Similar to Alternative 1, grazing lands surround the Alternative 4 site. Since the site is located on the periphery of existing development, this alternative would not physically divide an established community. There would be no impact.

Conflict with Merced County General Plan

Under this alternative, the proposed sites of the Campus and University Community would be within the already approved SUDP. Similar to Alternative 1, the Campus would not be subject to local plans and policies. Also, given that the Campus site was designated as part of the UC Merced SUDP under the 2002 project approvals, it would be consistent with the Merced County general plan.

Alternative 4 would develop the University Community directly south of the Campus within the existing UC Merced/University Community SUDP boundaries. Therefore, no change to the SUDP boundary is necessary and no change to the existing designation of Multiple-Use Urban Development in the County general plan is needed at this time. Therefore, Alternative 4 would not conflict with the County general plan and this would be considered a less-than-significant impact related to land use and planning.

Conflict with City of Merced General Plan

Similar to Alternative 1, Alternative 4 would also not result in a conflict with the City of Merced's adopted general plan because the campus is anticipated in that plan (regardless of exact location) and the UCP policies do not conflict with the City general plan policies. The impact will be less than significant.

Result in Incompatible Land Uses

Similar to Alternative 1, the development of the campus and University Community under this alternative would not result in placement of incompatible land uses adjacent to each other. Similarly, conflicts of University Community land uses with adjacent agricultural and rural residential uses would be avoided or minimized by the UCP policies cited above for Alternative 1. The impact would be less than significant.

Conflict with LAFCO Policies for Annexation

Similar to Alternative 1, this alternative would also need water, sewer, and other city services from the City of Merced to be provided to the Campus and University Community, which could require

annexation. Alternative 4 would be similar to the Proposed Action in all respects and would be substantially consistent with LAFCO for annexation. The impact would be less than significant.

Conflict with LAFCO Policies for Creation of Special Districts

Similar to Alternative 1, in the event that the Alternative 4 site is not annexed to the City of Merced, revisions to existing service district boundaries and/or the establishment of new service districts would be necessary in order to provide water, wastewater, fire and police services to the remainder of the campus (outside of Phases 1 and 2 of the campus) and all of the University Community. Similar to Alternative 1, the plans for the development of the campus and University Community would not conflict with the five criteria used by LAFCO for revisions to or establishment of special districts. Therefore, the impact would be less than significant.

4.9.6.5 Alternative 5 – No Action

Under this alternative, the remainder of the campus (outside of Phase 1.1 Campus) and all of Community North would not be built. However, the property owners of Community South could still develop the site based on development plans not related to the establishment of a UC Campus in Merced.

The development of Community South would not divide an established community, as no community is present in the area to be so affected. Because Community South is located within an existing SUDP, this alternative would not require a change in SUDP boundary. Depending on the scale and nature of development that is proposed in Community South, annexation to the City for city services could be required. The impacts from the alternative would be less than significant.

4.9.6.6 Alternative 6 – No Build

Under the No Build Alternative, no further development on the project site would occur and therefore, there would be no impact related to land use from the implementation of this alternative.

4.9.7 SUMMARY COMPARISON OF ALTERNATIVES

All of the alternatives would result in no impacts associated with physically dividing an existing community. Alternative 4 would displace residences but would not physically divide a community.

Implementation of Alternatives 1, 2, 4, and 5 would result in similar types of impacts related to consistency with the Merced County General Plan. The magnitude of these impacts, however, differs for each alternative. Alternative 1 would require a boundary change to the UC Merced/University Community SUDP associated with the addition of 222 acres of land to the University Community, and

this change is likely to be found by the County Board of Supervisors to not be in conflict with the criteria used by the County for SUDP boundary change or the general plan. Moreover, annexation under this alternative would be consistent with Merced LAFCO's policies. Alternative 2 would also require an expansion of the UC Merced/University Community SUDP and a boundary change. However, because the expansion would be substantial, this change could potentially be found by the County Board of Supervisors to be in conflict with the general plan. In addition, LAFCO could potentially find that annexation under this alternative conflicts with LAFCO's policies because of the higher proportion of Prime Agricultural land involved. Alternative 3 would require a change to the City of Merced SUDP boundary and a change in the existing land uses under the County's general plan. However, since the SUDP boundary change is anticipated by the County and the City as part of the City's general plan update, the magnitude of the impact to the County's general plan is not considered as substantial. Because Alternative 4 would require no change to the SUDP boundary, it would be consistent with the County General Plan.

All alternatives would be substantially consistent with the City's general plan because the City's plan anticipates a new UC campus and an associated community. However, the location of the Campus and University Community is not anticipated by the City at the site of Alternative 3 and would conflict with the existing general plan land use designations at the respective locations. Furthermore, the alternative would displace previously approved land uses and the impact related to this displacement is considered potentially substantial.

In summary, the magnitude of land use impacts of Alternative 2 and 3 would be greater than impacts associated with the other build alternatives that would locate the Campus and the University Community within or near the UC Merced/University Community SUDP.

Table 4.9-1
Consistency with Merced County LAFCO Policies

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Agricultural Policies			
Objective: Prime agricultural land is protected and conserved while ensuring there are adequate areas for efficient and orderly growth.			
Policy 1:	In determining whether a City or Special District Annexation would affect prime agricultural land, the Commission shall apply the definition of "prime agricultural land" established under Section 56064 of the Cortese/Knox/Hertzberg Reorganization Act of 2000: Land that has not been developed for a use other than an agricultural use and that meets any of the following qualifications: a. Land that, if irrigated, qualifies for rating as Class I or Class II in the USDA Natural Resources Conservation Service land use capability classification, whether or not the land is actually irrigated, provided that irrigation is feasible. b. Land that qualifies for rating 80 through 100 Stories Index Rating. c. Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture in the National Handbook on Range and Related Grazing Lands, July 1967, developed pursuant to Public Law 46, December 1935.	As discussed in **Section 4.2, Agricultural Resources,** land within both the Campus and University Community would qualify as prime farmland per the definition of prime agricultural land adopted by LAFCO. Impacts of the Campus were found to be less than significant because the conservation easements that the University has already acquired include both prime farmland as defined by FMMP and grazing lands that would adequately compensate for the loss of prime agricultural land within the Campus. With respect to the prime agricultural lands within the University Community, implementation of Mitigation Measure AG-1 would set aside an equal or greater amount of Important Farmlands compared to what would be removed. This would reduce the project's impacts to the loss of prime agricultural land. The Proposed Action is therefore consistent with this policy.	No mitigation measure is required for the Campus portion of the Proposed Action. Mitigation measure is included to address the impact from the loss of Important Farmland within the University Community.

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 1 (continued)	d. Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than four hundred dollars ($400) per acre. e. Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than four hundred ($400) per acre for three of the previous five calendar years.		
Policy 2:	At the time of adoption of a sphere of influence for a city or urban service district, efforts to direct growth away from large concentrations of prime agricultural land shall be demonstrated, recognizing that some conversion of prime lands may be inevitable.	LAFCO Prime Agricultural Land Policy 2 is intended to direct growth away from large concentrations of prime agricultural land, although the policy recognizes that some conversion of Prime Farmland could be inevitable. The land within the Campus boundary is not actively farmed. Furthermore, campus land that is not developed will remain in grazing until such time that it is needed for development. Similarly, the northern portion of the University Community is not actively farmed and will remain in grazing until needed for development. Farmlands and other intensively cropped soils are located on the southern portion of the University Community. That farmland would remain in agricultural production until development occurs in Community South. UCP Policies A 1.1 and LU 9.10	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 2 (continued)		address phasing to avoid premature conversion of farmland. Therefore, although the proposed UCP would result in the conversion of prime agricultural land, UCP policies would ensure that growth within the University Community area would not prematurely convert prime farmland and that prime farmland outside of the UCP area would be protected from conversion. Furthermore, the University has committed to and already placed substantial acres of lands in eastern Merced County under conservation easements, including approximately 70 acres of Important Farmlands and approximately 26,000 acres of grazing land that will be permanently protected from development. Therefore, the project is consistent with this policy.	
Sphere Of Influence Revision Policies			
Objective II. A: Create an urban land use pattern in the city that provides adequate areas for growth while ensuring the efficient delivery of services.			
Policy 1:	A City's sphere of influence boundary should be large enough to accommodate approximately 20 years of projected growth as well as territory that represents special communities of interest for the City.	The City of Merced is responsible for creating a sphere of influence boundary. The existing SOI extends to the north and east of the Campus, see **Figure 4.9-1, Existing and Proposed Specific Urban Development Plan (SUDP) and Sphere of Influence (SOI).** It is expected that as part of its updated general plan and revised SOI, the City will propose that	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 1 (continued)		SOI boundary to the north of the campus be revised to exclude the area to the north and east of the currently proposed campus and the SOI be expanded to the south and east to include the entire University Community. The University believes that the Campus represents a special community of interest for the City. Therefore, development of the Proposed Action is consistent with this policy.	
Policy 2:	LAFCO will recognize areas outside the sphere of influence boundary that reflect unique coordinated planning areas agreed to between the City, County and/or urban service district which are designated "area of interest", "joint planning area" or similar designation as identified in the City and County General Plans.	The northern part of the Campus site is within the City's sphere of influence. The majority of Community North and Community South is within an area designated "Joint UC Planning Area" in the City's general plan and is designated "Multi-Use Urban District" in the County's General Plan. The eastern portion of Community North would represent an extension of these designated areas. Therefore, the project site reflects unique coordinated planning areas in the City and County general plans.	
Policy 3:	Cities should adopt phasing policies in their General Plans which identify priorities for growth and annexation which meet the joint objectives of extending urban services in an economic and efficient manner and avoiding the premature conversion of prime agricultural lands or other valuable open space resources.	As discussed in **Section 4.2, Agricultural Resources,** some prime farmland within both the Campus and University Community would be converted to non agricultural uses. Grazing activities and use of irrigated pasture would continue	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 3 (continued)		on portions of the Campus until specific facilities are proposed for construction. Furthermore, the University has already placed 70 acres of prime farmland and 26,000 acres of grazing land in easements that would protect those lands from development. Agricultural operations would continue to occur on the undeveloped portions of the University Community site as it is being built out. UCP Policy LU 1.6 permits and encourages continued agricultural uses as interim uses as the University Community lands are progressively developed. Therefore, implementation of the University Community would avoid premature conversion of prime agricultural lands. Furthermore, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that the pressure on adjacent agricultural lands to convert to other uses would be minimized. Therefore, the Campus and University Community are consistent with this policy.	
Policy 4:	Where the City and County have reached agreement on proposed sphere of influence boundaries and development standards, the Commission will accept the sphere unless the Commission identifies an inconsistency with the requirements of the Cortese/Knox/Hertzberg Local Government Reorganization Act of 2000.	The consistency of the proposed Campus and University Community with the requirements of the Cortese/Knox/ Hertzberg Local Government Reorganization Act of 2000 is the subject of this analysis.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Objective II. B: The future urbanization of a City is reviewed comprehensively at the sphere of influence amendment stage rather than during the review of individual annexation requests.			
Policy 5:	The following criteria will be applied to cities requesting a sphere of influence amendment which is included in their General Plans and Policies that address both the Cortese/Knox/Hertzberg Act and Merced County LAFCO policies: a. Does the General Plan identify the City's desired sphere of influence boundary and all planned land uses in the expanded sphere? b. Does the City's General Plan contain policy regarding the phasing of future annexations which is consistent with the policies of Merced County LAFCO and the Cortese/Knox/Hertzberg Act? c. Are there local policies regarding the timing of conversion of agricultural and other open space lands and the avoidance of conversion of prime soils? d. Does the City's General Plan demonstrate the present and probable need for public facilities and community services (including the sequence, timing and probable cost of providing such services) within the proposed sphere of influence boundary? e. Does the City's General Plan identify the existence of any social or economic communities of interest within the planning area, such as the relationship between any adjacent or nearby cities or special districts which provide urban services, which may affect the boundaries or the proposed sphere of influence?	City's SOI was expanded in 1997 with the Merced 2015 General Plan to include the northern portion of the Campus site. The City will be requesting an expansion of its SOI for the purpose of updating the general plan. In general, annexation of the project site is subject to Merced County LAFCO policies that are used to encourage the orderly development of land in the county and to preserve prime agricultural land. As described under OBJECTIVE II. A. Policy 3, the UCP policies would require the continuation of agricultural uses on the land until such time as the land is needed for development. Grazing and agricultural uses would continue until facilities are proposed for construction.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation	Cities that address the above referenced criteria/issues in their General Plans will have their sphere of influence amendment proposals scrutinized more thoroughly by LAFCO. The Commission shall adopt findings for each of the criteria indicating conformance with State and local LAFCO policy. Upon approval of the sphere boundary, LAFCO's review of future annexations within this boundary will be limited to the appropriateness and efficiency of the boundary, conformance with the City's General Plan including relevant phasing policies, and public service availability. However, when the Commission finds that the City's General Plan does not satisfy one or more of the above sphere of influence criteria in accordance with State and local LAFCO policy, action on the sphere will be more limiting. Approval of an amended sphere boundary will reflect the City's interest in the future annexation of the territory but will not represent a general acceptance of future individual annexation requests. All subsequent annexation proposals will be scrutinized against the full factors outlined in the Cortese/Knox/Herzberg Act under Section 56668, including justification for annexing prime agricultural or other valuable open space lands when other non-prime or non-significant open space lands are available in the sphere; availability of public services; and the timing of the annexation in relation to vacant land availability within the existing City limits.	The criteria above are addressed to the extent feasible for the purposes of this consistency analysis.	
Objective II.C: Create an urban land use pattern in unincorporated communities that provides adequate areas for growth while ensuring the efficient delivery of services.			
Policy 6:	An urban service district's sphere of influence boundary should be large enough to accommodate approximately 20 years of projected growth as well as territory that represents special communities of interest for the district.	The Proposed Action site represents more than 20 years of growth.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 7:	LAFCO will recognize areas outside the sphere of influence boundary that reflect unique coordinated planning areas agreed to between the urban service district, City and/or County which are designated "area of interest", "joint planning area" or similar designation as identified in the City and/or County General Plans.	The UC Merced LRDP was adopted by the University in 2002, while the University Community Plan was adopted by the County in 2004. The planning area for the LRDP and UCP, including most of the proposed Campus and University Community, is designated in the City's general plan as "UC Joint Planning Area." Therefore, the Proposed Action represents a unique coordinated planning area and would be consistent with this policy.	
Policy 8:	The County should adopt phasing policies in the General Plan or Community Plan which identify priority areas for growth and future district annexation and meet the joint objectives of extending urban services in an economic and efficient manner while avoiding premature conversion of prime agricultural lands or other valuable open space resources.	As discussed in **Section 4.2, Agricultural Resources,** prime farmland within the Campus and University Community would be converted to non-agricultural uses. However, grazing activities and use of irrigated pasture would continue on portions of the Campus until specific facilities are proposed for construction. Furthermore, the University has already placed 70 acres of Important Farmland in easements that would protect those lands from development. Agricultural operations would continue to occur on the undeveloped portions of the University Community site as it is being built out. UCP Policy LU 1.6 permits and encourages continued agricultural uses as interim uses as the University Community lands are progressively developed.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 8 (continued)		Therefore, implementation of the University Community would avoid premature conversion of prime agricultural lands. Furthermore, adherence to UCP Policies A 1.2, 1.3, and 3.1 would ensure that these conflicts would be minimized and the pressure on adjacent agricultural lands to convert to other uses would be minimized. Therefore, implementation of the Proposed Action in the City or County would not be inconsistent with this policy.	
Objective II. D: The future expansion of an urban service district is reviewed comprehensively at the sphere of influence amendment stage rather than during the review of individual annexation requests.			
Policy 9	The following criteria will be applied to an urban service district requesting a sphere of influence amendment when policies in the County General Plan and/or a Community Plan are found consistent with both the Cortese/Knox/Hertzberg Act and Merced County LAFCO policies: a. Does the County General Plan and/or Community Plan identify the urban service district's desired sphere of influence boundary and all planned land uses in the expanded sphere as identified as the Specific Urban Development Plan (SUDP) boundary? b. Does the County General Plan and/or Community Plan contain policy regarding the phasing of urban expansion that is consistent with the policies of Merced County LAFCO and the Cortese/Knox/Hertzberg Act?	The City currently provides water and wastewater services to the Phase 1.1 Campus through a 2003 "Services Contract" between the City and Merced. The County revised the SUDP boundaries to include the Campus and University Community in 2004. The City also extended the boundaries of the Joint UC Planning Area to include the SUDP Area. The majority of the Campus and University Community site is within the City's "Joint UC Planning Area."	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 9 (continued)	c. Are there local policies regarding the timing of conversion of agricultural and other open space lands and the avoidance of conversion of prime soils? d. Does the County General Plan and/or Community Plan demonstrate the present and probable provision of public facilities and community services (including the sequence, timing and probable cost of providing such services) within the proposed sphere of influence boundary? e. Does the County General Plan and/or Community Plan identify the existence of any social or economic communities of interest within the planning area, such as the relationship between any adjacent or nearby cities or special districts which provide urban services, which may affect the boundaries of the proposed sphere of influence?	Therefore, the City is anticipating this growth and it is anticipated that urban service districts sphere of influence would be extended to include the project site upon approval of the City's SOI expansion. Both the Campus and the University Community are expected to receive certain City utility services, including water, sewer, and fire protection in the case of the Campus and water, sewer, stormwater, law enforcement and fire protection in the case of the University Community. Impacts related to these services are discussed in **Section 4.11, Public Services and Recreation,** and **Section 4.14, Utilities and Service Systems.** The City proposes the annexation of the Campus and University Community through the use of annexation agreements. Therefore, the project would be consistent with the criteria for urban service district sphere of influence amendments.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Objective II. E: The sphere of influence reports for urban service districts clearly identify the types and capacity of services being provided to ensure their efficient and orderly delivery.			
Policy 10:	Ensure that urban service districts have adequately planned for the efficient delivery of services by requiring the following information be provided with sphere of influence applications: a. Identify the function, type and class of services provided by the district and available to future annexation areas; and b. Identify the nature, location and extent of any functions or classes of service provided by the district.	The City would provide water and wastewater services to the project site. Impacts associated with these services, as described in detail in **Section 4.14, Utilities and Service Systems,** were found to be less-than-significant. In 2006, the City certified an EIR for the expansion of the City's WWTP to a design capacity of 20 mgd. The additional capacity would be installed in phases. With the implementation of the first phase of improvements, the WWTP's capacity will increase to 12 mgd. With the approved expansion of the WWTP, assuming growth consistent with the adopted general plan, the City will have adequate capacity to serve the proposed Campus and University Community. The 2005 UWMP identifies an adequate amount of water to serve the Campus and the University Community. The project is consistent with this policy.	
Policy 11:	Unless authorized by the Cortese/Knox/Hertzberg Act, no new or different function or class of service shall be provided by an urban service district beyond that identified in the sphere of influence report adopted by the Commission.	The function or class of services to be provided to the project are identified in **Section 4.14, Utilities and Service Systems** and would be similarly reported in any sphere of influence report incorporating the Proposed Action.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
City and Urban Service District Annexation Policies			
Objective III. A: City annexations reflect a planned, logical and orderly progression of urban expansion and promote efficient delivery of urban services.			
Policy 1:	Annexation boundaries should form a logical and efficient urban development pattern.		
Implementation:	Utilize the following criteria in the review of annexation requests: a. The proposed annexation boundary is appropriate in relation to existing city boundaries. b. Avoid the creation of islands, corridors, peninsulas or other undesirable boundary characteristics that lead to service inefficiencies and potential land use conflicts. c. Proximity of the annexation to existing developed or developing areas within the City. Annexations shall be contiguous with existing city boundaries unless it can be demonstrated to be orderly, logical or appropriate under special circumstances. d. Evaluate any alternatives to the annexation which would be more consistent with orderly growth, open space protection and public service efficiency goals of LAFCO. e. The existence of any social or economic communities of interest within the proposed annexation territory including the relationship between any adjacent or nearby cities or special districts which provide urban services that may affect the territory. f. The use of natural or physical features (such as canals or roads) as annexation boundaries is encouraged over use of property lines. All annexation requests that do not conform to existing lines of assessment or property lines shall be justified by the proponent.	The proposed Campus and University Community would be developed over a period of time that would exceed 20 years. UC has requested the City to revise its SOI and general plan to include the entire Campus and University Community as currently proposed. It is expected that as part of the General Plan Update process, the City will propose that the territory between the proposed Campus and University Community sites be included within the City's SOI.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 2	Annexation proposals should be consistent with and implement City General Plan and Sphere of Influence policies:		
Implementation:	Utilize the following criteria in the review of annexation requests: a. Consistency of the proposal with City General Plan policy including planned land use designation, densities and other land use and development policy. b. Consistency with planned phasing of growth and improvements as defined in the City's General Plan and/or Sphere of Influence Report. c. Consistency with adopted open space and conservation policies of the City.	As part of the City of Merced's General Plan amendment that is currently underway, the City plans to revise its SOI to include the entire Campus and University Community as currently proposed. The land use designations and densities within the Campus and proposed revised University Community are consistent with the City's general plan. The land use plans of both areas are also consistent with the City's open space and conservation policies. Therefore, implementation of the Proposed Action would be consistent with this policy.	
Policy 3	All territory proposed for annexation shall be prezoned by the City, and no changes in General Plan designations or prezoning are permitted within two years following annexation, consistent with the Cortese-Knox-Hertzberg Act of 2000.	As part of the General Plan Update process, it is anticipated that the Campus and University Community site will be prezoned by the City. Therefore, the proposed project would not conflict with the	
Policy 4	Public services shall be available to all annexed land in an efficient and orderly manner.		

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation	Utilize the following criteria in the review of annexation requests: a. Adequacy of governmental services for both existing and proposed land uses within the annexation territory. b. The ability to provide needed public services and facilities as demonstrated in the "plan for services," including the sufficiency of revenue sources for those services. c. Timely availability of water supplies adequate for projected needs as specified in Section 56668(k) of the Cortese-Knox-Hertzberg Act of 2000. d. Demonstration that public services will not be provided to annexing territory to the detriment of territory already within the City.	**Section 4.14, Utilities and Service Systems** includes a description of the availability of water and wastewater services to the project site under near-term and long-term scenarios. **Section 4.11 Public Services and Recreation** includes a description of other urban services that would serve the project site.	
Policy 5	Promote a balance of housing for persons and families of all income levels.		
Implementation	Utilize the following criteria in the review of annexation requests: a. The extent to which the proposal will assist the receiving entity in achieving its fair share of the regional housing needs as determined by the Merced County Association of Governments.	The proposed University Community would include a variety of housing types to reflect diverse student, faculty, and resident needs based on household characteristics, income, job needs, culture, lifestyle, and residency tenure. Therefore, the proposed project would not conflict with this policy.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Policy 6	Analysis of agricultural or open space impacts from an annexation will be minimized when the Commission can make a finding that these resources were fully addressed during establishment of the City's Sphere of Influence and the annexation is consistent with any related sphere policy to protect these resources.	Environmental impacts associated with agriculture and open space are addressed in **Section 4.2, Agricultural Resources** in this EIR/EIS.	
Policy 7	Utilize considerations consistent with the Cortese-Knox-Hertzberg Act of 2000 when evaluating agricultural and open space impacts on an individual annexation level.		
Implementation	Utilize the following criteria in the review of annexation requests a. Consider the amount of existing vacant land within the City that is available for similar types of development to the proposed annexation. Make a comparison of existing vacant and available land to the amount of land needed to accommodate growth needs over a ten year period as established in the City's General Plan or other official projection such as that adopted by the Merced County Association of Governments. The City must provide evidence why the consideration of existing vacant land is not appropriate based on such factors as location, limitations to infrastructure, development constraints, agricultural viability, economic market conditions, or unique characteristics of the annexation project. b. If the annexation involves the conversion of prime agricultural land or identified valuable open space land, consider alternatives to the annexation that avoid or reduce the impacts.	This EIR/EIS includes a review of the environmental consequences associated with development of the Infill Alternative. See **Section 3.0, Alternatives**. A summary comparison of each alternative to the Proposed Action is provided at the end of each subsection in **Section 4.0, Affected Environment and Environmental Consequences**. All build alternatives involve some conversion of prime agricultural land. A comparison of alternatives for their impact on prime farmlands is presented in **Section 4.2, Agricultural Resources.** The University Community would be located adjacent to existing agricultural lands. The UCP includes several policies to minimize potential conflicts between the project site uses and the adjacent lands in active agriculture.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation (continued)	c. If annexation will result in urban development adjacent to existing agricultural lands, consider measures to minimize potential conflicts such as land use transitions or buffers and "right to farm" notification to future residents.		
Policy 8	In the case of large comprehensive development proposals, annexation should be phased whenever feasible. The Commission may approve annexation of all the subject territory if it finds the territory is likely to be developed within a reasonable period of time and if the City has adopted a phasing plan for the territory and policies for ensuring adequate facilities will be available once development occurs. Adoption of a specific plan for the territory by the City would be the most desirable means to ensure LAFCO policies are satisfied.	The Campus and University Community would be developed in phases. See **Section 2.0, Project Description**. It is not known at this time whether the City will propose phasing of annexation.	
Objective III. B: Urban service district annexations reflect a planned, logical and orderly progression of urban expansion and promote efficient delivery of urban services.			
Policy 1	Annexation boundaries should form a logical and efficient urban development pattern.		
Implementation	Utilize the following criteria in the review of annexation requests: a. The proposed annexation boundary is appropriate in relation to existing district boundaries. b. Avoid the creation of islands, corridors, peninsulas or other undesirable boundary characteristics that lead to service inefficiencies and potential land use conflicts. c. Proximity of the annexation to existing developed or developing areas within the district. Annexations shall be contiguous with existing district boundaries unless it can be demonstrated to be orderly, logical or appropriate under special circumstances.	The City currently provides water and wastewater services to the Phase 1.1 Campus through a 2003 "Services Contract" between the City and Merced. The proposed Campus and University Community would extend from the existing Phase 1.1 Campus. Therefore, the annexation boundary is appropriate and logical in relation to the existing SOI. It is expected that as part of the General Plan Update process, the City will propose that the territory between the	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation (continued)	d. Evaluate any alternatives to the annexation which would be more consistent with orderly growth, open space protection and public service efficiency goals of LAFCO. e. The existence of any social or economic communities of interest within the proposed annexation territory including the relationship between any adjacent or nearby cities or special districts which provide urban services that may affect the territory. f. The use of natural or physical features (such as canals or roads) as annexation boundaries is encouraged over use of property lines. All annexation requests that do not conform to existing lines of assessment or property lines, shall be justified by the proponent.	proposed Campus and University Community sites be included within the City's SOI. This EIR/EIS evaluates alternatives to the Proposed Action, including an Infill Alternative which was found to be infeasible. The environmental impacts associated with the provision of utilities and services under each alternative are described and compared in **Section 4.14, Utilities and Service Systems.**	
Policy 2	Annexation proposals should be consistent with and implement the County General Plan and district Sphere of Influence policies		
Implementation	Utilize the following criteria in the review of annexation requests: a. Consistency of the proposal with County General Plan and Community Plan policy including planned land use designation, densities and other land use and development policy. b. Consistency with planned phasing of growth and improvements as defined in the County General Plan and Community Plan. c. Consistency with planned phasing of growth and improvements as defined in the County's General Plan and/or district Sphere of Influence Report.	A consistency analysis of the proposed Campus and University Community with the County General Plan was conducted in **Section 4.9, Land Use and Planning.** The Proposed Action was found to be consistent with applicable County policies.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation (continued)	d. Consistency with adopted open space and conservation policies of the County. e. The annexation territory is designated for urban land uses in the County General Plan, when the annexation area is proposed for urban development.		
Policy 3	Public services shall be available to all annexed land in an efficient and orderly manner.		
Implementation	Utilize the following criteria in the review of annexation requests: a. Adequacy of governmental services for both existing and proposed land uses within the annexation territory. b. The ability to provide needed public services and facilities as demonstrated in the "plan for services", including the sufficiency of revenue sources for those services. c. Timely availability of water supplies adequate for projected needs as specified in Section 56668(k) of the Cortese-Knox-Hertzberg Act of 2000. d. Demonstration that public services will not be provided to annexing territory to the detriment of territory already within the district.	**Section 4.14, Utilities and Service Systems** includes a description of the availability of water and wastewater services to the project site under short-term and long-term scenarios. The City would provide water and wastewater services to the project site. Impacts associated with these services, as described in detail in **Section 4.14,** were found to be less-than-significant. In 2006, the City certified an EIR for the expansion of the City's WWTP to a design capacity of 20 mgd. The additional capacity would be installed in phases. With the implementation of the first phase of improvements, the WWTP's capacity will increase to 12 mgd. With the approved expansion of the WWTP, assuming growth consistent with the adopted general plan, the City will have adequate capacity to serve the proposed Campus and University Community.	

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation (continued)		The 2005 UWMP identifies an adequate amount of water to serve the Campus and the University Community. The project is consistent with this policy.	
Policy 4	Promote a balance of housing for persons and families of all income levels.		
Implementation	Utilize the following criteria in the review of annexation requests: a. The extent to which the proposal will assist the County in achieving its fair share of the regional housing needs as determined by the Merced County Association of Governments or the Housing Element of the Merced County General Plan.	The proposed University Community would include a variety of housing types to reflect diverse student, faculty, and resident needs based on household characteristics, income, job needs, culture, lifestyle, and residency tenure. Therefore, adoption of the project would not conflict with this policy.	
Policy 5	Analysis of agricultural or open space impacts from an annexation will be minimized when the Commission can make a finding that these resources were fully addressed during establishment of the District's Sphere of Influence and the annexation is consistent with any related sphere policy to protect these resources.	Environmental impacts associated with agriculture and open space are addressed in **Section 4.2, Agricultural Resources** in this EIR/EIS.	
Policy 6	Utilize considerations consistent with the Cortese-Knox-Hertzberg Act of 2000 when evaluating agricultural and open space impacts on an individual annexation level.		

Section and Policy Number	Policy Text	Consistency	Mitigation Measure
Implementation	Utilize the following criteria in the review of annexation requests: a. Consider the amount of existing vacant land within the District that is available for similar types of development to the proposed annexation. Make a comparison of existing vacant and available land to the amount of land needed to accommodate growth needs over a ten year period as established in the County's General Plan or other official projection such as that adopted by the Merced County Association of Governments. The district must provide evidence why the consideration of existing vacant land is not appropriate based on such factors as location, limitations to infrastructure, development constraints, agricultural viability, economic market conditions, or unique characteristics of the annexation project. b. If the annexation involves the conversion of prime agricultural land or identified valuable open space land, consider alternatives to the annexation that avoid or reduce the impacts. c. If annexation will result in urban development adjacent to existing agricultural lands, consider measures to minimize potential conflicts such as land use transitions or buffers and "right to farm" notification to future residents.	This EIR/EIS includes a review of the environmental consequences associated with development of the Infill Alternative. See **Section 3.0, Alternatives**. A summary comparison of each alternative to the Proposed Action is provided at the end of each subsection in **Section 4.0, Affected Environment and Environmental Consequences**. All build alternatives involve some conversion of prime agricultural land. A comparison of alternatives for their impact on prime farmlands is presented in **Section 4.2, Agricultural Resources.** The University Community would be located adjacent to existing agricultural lands. The UCP includes several policies to minimize potential conflicts between the project site uses and the adjacent lands in active agriculture.	

4.9.8 REFERENCES

City of Merced. 1997. *Merced Vision 2015 General Plan.*

City of Merced. 2006. City of Merced Resolution 2008-89, "Merced City Council: University Community Policy Statement."

City of Merced. 2007. "Administrative Draft General Plan Update Land Use Diagram," Memorandum to Merced County Local Agency Formation Commission.

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4.10 NOISE

4.10.1 INTRODUCTION

This section describes the existing noise environment in the project area and documents changes in the baseline conditions, including the addition of noise-sensitive receptors and increases in traffic noise, that have occurred since the preparation of the previous Environmental Impact Reports (EIR) for the UC Merced Campus and the University Community. The noise impacts associated with the implementation of the Proposed Action are assessed with respect to the applicable significance thresholds specified in the state and local regulatory programs and adopted plans. Key noise issues include exposure of existing and proposed noise-sensitive land uses to construction noise and increases in traffic noise along the roadway network from project-related changes in traffic patterns.

Scoping comments received on the Notice of Intent/Notice of Preparation (NOI/NOP) issued for this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) expressed concern regarding increased noise levels in the University Community area.

4.10.2 AFFECTED ENVIRONMENT

4.10.2.1 Fundamentals of Environmental Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called "A-weighting," written "dBA." In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving sound level.

Different types of metrics are used to characterize the time-varying nature of sound. These metrics include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_{xx}), the day-night sound level (L_{dn}), and the community noise

equivalent level (CNEL). Below are brief definitions of these metrics and other terminology used in this chapter:

- **Sound.** A vibratory disturbance created by a vibrating object which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Maximum Sound Level (L_{max}).** The maximum sound level measured during the measurement period.
- **Minimum Sound Level (L_{min}).** The minimum sound level measured during the measurement period.
- **Equivalent Sound Level (L_{eq}).** The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
- **Day-Night Level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM

L_{dn} and CNEL values differ by less than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment.

4.10.2.2 Alternative 1, Proposed Action - Existing Conditions

The Proposed Action is located in eastern Merced County, east of Lake Yosemite and Lake Road, approximately 2 miles northeast of the corporate limits of the City of Merced, California. The Proposed Action would establish a major research university in Merced County that will ultimately support 25,000 full-time equivalent students with an associated community needed to support the university. The Proposed Action assessed in this document consists of three major components: the Campus (815 acres); the Community North (833 acres); and, the Community South (1,118 acres).

Construction of the first phase of the Campus began in 2002 and UC Merced formally opened to undergraduate enrollment in the fall of 2005. Other than the Phase 1.1 Campus development, the project site is largely undeveloped and no major fixed noise sources exist on the site. Noise sources include traffic on local roadways and noise from agricultural equipment. Noise-sensitive receptors in the vicinity of the site include a few residences located along Lake Road to the east and Yosemite Avenue to the south of the project site. In addition, Lake Yosemite Regional Park is located to the north of the Phase 1.1 Campus.

Roadways and Freeways

No heavily traveled roads or freeways are within the area of the Proposed Action. State Route (SR) 99, SR 59, and SR 140 are all located about 2.5 miles or further from the site and do not affect noise levels in the project area. Nearby roadways tend to be lightly traveled, at moderate vehicle speeds, and do not handle large volumes of heavy-duty trucks or buses. As such, while motor vehicle traffic causes noise within the project area, and tends to be the primary noise source in locations adjacent to traveled roadways, the resulting noise levels are not excessive.

Railroad Traffic

The Burlington Northern/Santa Fe (BNSF) Railroad main line passes through the City of Merced and is approximately 2.5 miles to the south of the project area. This rail line carries frequent north-south freight train traffic and daily Amtrak passenger trains. Because the railroad is sufficiently distant from the project area, noise from railroad traffic does not affect ambient noise levels at the site of the Proposed Action.

Aircraft Overflights

The Merced Municipal Airport is approximately 5 miles to the southwest of the project area, and Castle Airport (the former Castle Air Force Base) is approximately 6 miles to the west. While noise from aircraft overflights is occasionally perceptible within the project area, it does not substantially affect the noise environment. A review of the County's Noise Element indicates that the 65 dBA L_{dn} noise contours from the airports in the region would not encompass or include any portion of the project site.

A private airstrip is located east of the University Community (east of Community South). The airstrip is used by planes involved in agriculture operations (e.g., fertilizing, seeding, and baiting). Historically, as many as 50 take offs and landings would occur in a single day, although the airstrip was used seasonally, not every day. In the last two years, no more than 5 or 6 flights per day have occurred.

Stationary Sources

Stationary noise sources include common building or home mechanical equipment, such as air conditioners, ventilation systems, or pool pumps, and industrial or agricultural operations. These noise sources become a concern when they are in close proximity to land uses where people would be noise-sensitive. No industrial or manufacturing facilities are located in the project area; however, some agricultural-related operations and land maintenance activities cause occasional, daytime noise within the southern portion of the Proposed Action site (e.g., noise from farm equipment, crop-dusting, etc.). To the northwest of the Proposed Action site, the Lake Yosemite facilities provide recreational boating opportunities, which generate noise primarily during the daytime hours of the warmer months.

Ambient Noise Levels

A noise impact study of the Campus Project at a site adjacent to Lake Yosemite Regional Park was conducted in 2001 for the UC Merced 2002 Long Range Development Plan (LRDP) EIR. The study involved the monitoring of noise levels at various locations near the Proposed Action site and modeling of future noise levels based on projections of future traffic volumes prepared by Fehr & Peers Associates in 2001. A second noise impact study of the Campus project was conducted in 2007, which included the estimation of future noise levels at three alternative sites (called Alternatives 19, 20, and 8M in that study). Of the alternative sites evaluated in the 2007 noise study, Alternate 19 and 20 sites are adjacent to or close to the current Proposed Action site and Alternative 8M is a site near Livingston, which is addressed in the Supplemental Alternatives Analysis for the Proposed Action. No new monitoring was conducted in the vicinity of Proposed Action site for the 2007 noise impact study because noise levels in the study area were determined to be adequately characterized by the monitoring conducted in 2001. To update the 2001 measurements for the 2007 analysis, the second study used the results of a new traffic impact study conducted by URS in 2007. The 2007 traffic study used updated traffic information, including data from the recently updated Merced County Association of Governments (MCAG) regional traffic model. The noise measurements from 2001 and the results of both the 2001 and 2007 noise studies were used as the baseline for this analysis.

As noted above, an ambient noise monitoring survey was conducted on May 30 and 31, 2001 in the Merced area in the vicinity of the Proposed Action site for the UC Merced 2002 LRDP EIR. Short-term measurements (15 minutes in duration) were taken at 12 locations and unattended long-term (24 hours in duration); measurements were taken at two locations. The measurement locations are shown in **Figure 4.10-1, Noise Measurement Locations**. The measurement locations were selected to be representative of noise-sensitive receptors, consisting of residential, recreational, educational, and church land uses. The long-term measurements were made in the front lawn of a residence at 3629 Lake Road, between Atlantic

Street and Dunn Road (Merced LT-1), and in the front lawn of a residence at 2897 Bellevue Road, west of Lake Road (Merced LT-2). Short-term measurements were taken along roadways that were projected to experience increased traffic as a result of the development of the Campus and the University Community. All of the short-term measurements, except for ST-3, were conducted near residences and the noise meters were placed approximating setbacks of the front façade of the homes. ST-3 was adjacent to Merced College on G Street (UC Merced 2002).

Weather conditions during the May 2001 survey period were calm with clear skies. Air temperatures varied from 82 degrees F to 100 degrees F, with 16 to 46 percent relative humidity. Wind speed varied from 0 to 10 miles per hour (mph) during the survey period, with light breezes (0 to 3 mph) most of the time. The weather conditions were ideal for conducting noise measurements, and thus there was no adverse effect on the measurement accuracy due to the weather (UC Merced 2002).

The long-term measurements in the 2001 survey were made with Type 2, Metrosonics db3080 community noise analyzers. The short-term measurements were made with a tripod-mounted Type 1 Brüel & Kjær Type 2231 sound level meter (SLM) with statistical analyzer. The sound measuring instruments used for the survey were set on slow time response using the A-weighted decibel (dBA) scale for all of the noise measurements. To ensure accuracy, the laboratory calibration of the instruments was field checked before and after each measurement period using an acoustical calibrator. The accuracy of the acoustical calibrator is maintained through a program established by the manufacturer, and is traceable to the National Institute of Standards and Technology. The sound measurement instruments meet the requirements of the American National Standard S1.4-1983 and the International Electrotechnical Commission Publications 804 and 651. In all cases, the microphone height was 5 feet above the ground and the microphone was equipped with a windscreen. The long-term and short-term measurements in the second survey were made with Larson Davis Model 820 and CAL80 community noise analyzers (UC Merced 2002).

Table 4.10-1, Long-Term-Noise Measurement Data Summary, shows the results of the 2001 long-term surveys. The hourly daytime noise levels at LT-1 varied from 57 dBA L_{eq} to 54 dBA L_{eq}. Nighttime hourly noise levels at LT-1 varied from 54 dBA L_{eq} to 44 dBA Leq. Daytime hourly noise levels at LT-2 varied from 61 dBA L_{eq} to 53 dBA L_{eq}. Nighttime hourly noise levels at LT-2 varied from 59 dBA L_{eq} to 44 dBA L_{eq}. The L_{dn} values for LT-1 and LT-2 were 59 dBA and 61 dBA respectively. These levels are both below Merced County's exterior noise standard of 65 dBA L_{dn} (UC Merced 2002).

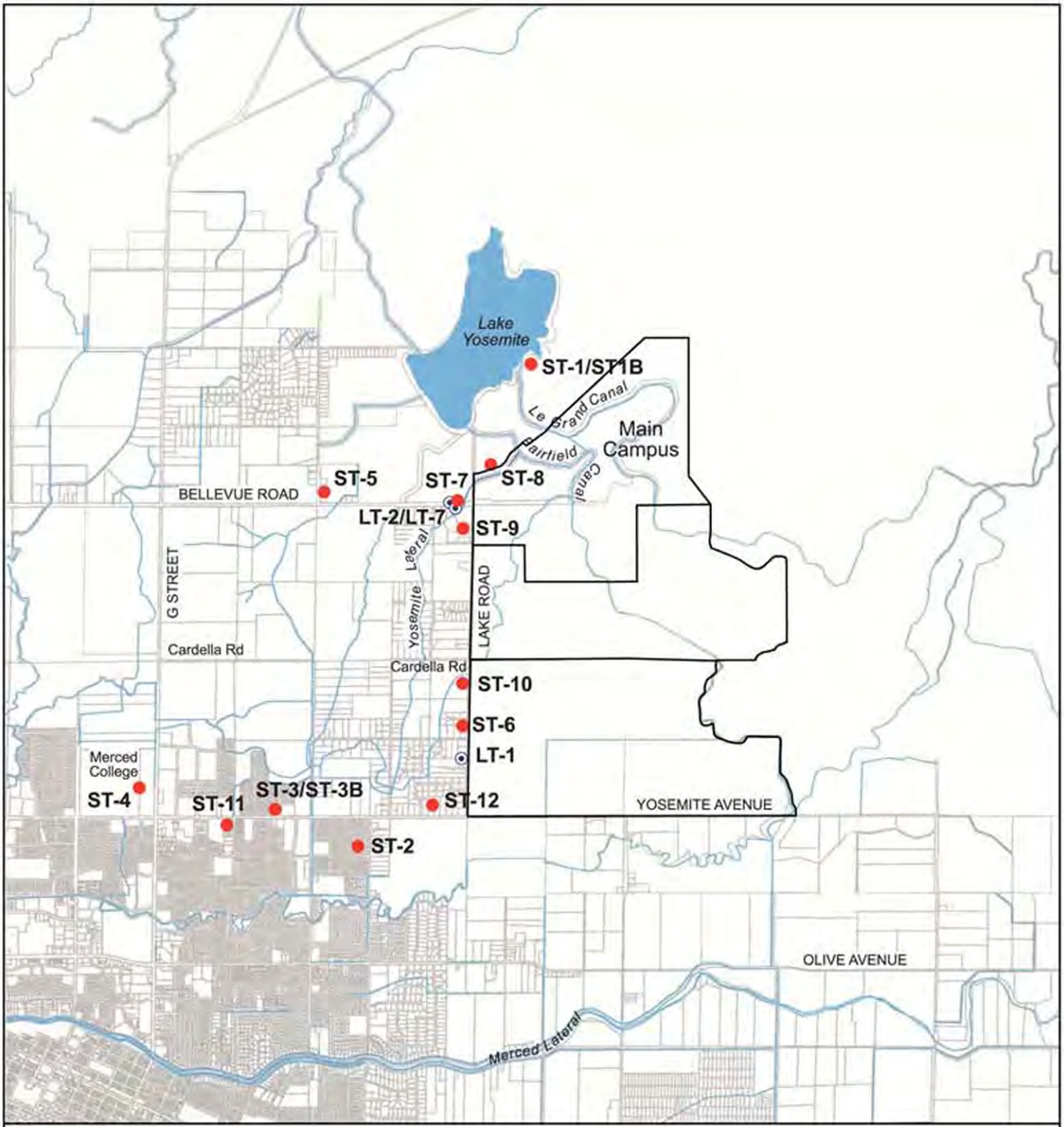
Table 4.10-1
Long-Term-Noise Measurement Data Summary

Site ID	Measurement Date	Location	24-hr L_{eq} (dBA)	24-hr L_{dn} (dBA)	24-hr CNEL (dBA)
LT-1	5/30/01–5/31/01	Front yard area of 3629 Lake Road (approx. 20 feet from front façade)	55	59	59
LT-2	5/30/01–5/31/01	Front yard area of 2897 Bellevue Road (approx. 25 feet from front façade)	57	61	62

Source: UC Merced 2002

Table 4.10-2, Short-Term-Noise Measurement Data Summary shows the results of the 2001 short-term measurements. The measured ambient noise levels vary from 52 to 59 dBA L_{eq} in the Merced area. Along Bellevue Road, noise levels range from 53 to 57 L_{eq}. Along Yosemite Avenue, ambient noise levels vary from 58 to 68 L_{eq}, and along Lake Road range from about 58 to 68 L_{eq}. (UC Merced 2002)

The measurements conducted in 2001 were all dominated by traffic noise and noise levels in the area and the noise levels continue to be dominated by traffic noise under current (2008) conditions. To update the 2001 measurements to be representative of 2008 conditions, traffic noise modeling was conducted to compare the 2001 and 2008 traffic volumes counts, provided by Fehr & Peers Transportation Consultants. Based on this comparison, traffic noise levels are calculated to have increased by 1 dBA or less along Olive Avenue, G Street, SR 59, SR 99, Lake Road, and Bellevue Road. Noise levels are calculated to have increased by 2 to 4 dBA along Yosemite Avenue.



LEGEND

ST-1 ● Short-Term Noise Measurement

LT-1 ⊙ Long-Term Noise Measurement

5000 2500 0 5000

APPROXIMATE SCALE IN FEET

SOURCE: URS - August 2008, UC Merced – May 2008

FIGURE **4.10-1**

Noise Measurement Locations

Table 4.10-2
Short-Term-Noise Measurement Data Summary

Site ID	Measurement Location	Measurement Period				Measurement Results, dBA					
		Date	Start Time	Duration (minutes	Noise Sources	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}
ST-1	Near picnic tables. South-central portion of Lake Yosemite Regional Park. Site overlooks project site to south.	5/30/01	13:20	15	Dist. Const. Noise (Heavy Trucks with Trailers)	48.0	65.6	32.1	35.6	41.1	48.6
ST- 1B	Same as ST-1 at Lake Yosemite Regional Park, near picnic benches	5/31/01	12:40	15	Dist. Const. Noise (Heavy Trucks with Trailers), not as much activity as prior measurement	44.0	55.3	21.3	37.1	41.1	47.6
ST-2	McKee Rd. at Silverado Ave (NW Corner). Mic is flush w/ nearby p/l wall (6′), & also in-line w/ S.F. homes to S. ≈38′ to centerline	5/30/01	14:50	15	Traffic, McKee Rd: 2 lanes, undivided	64.1	77.2	28.7	46.1	60.6	68.6
ST-3	Yosemite Ave at White Dove Ave (NW Corner). Mic is flush w/ resi's to W., ≈30′ closer to rdwy than church to E. (Shepherd of the Valley Lutheran Church)	5/30/01	13:15	15	Traffic, Yosemite Ave: 2 lanes, undivided	61.7	74.8	39.3	46.1	59.1	65.1

Site ID	Measurement Location	Measurement Period				Measurement Results, dBA					
		Date	Start Time	Duration (minutes	Noise Sources	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}
ST-3B	Same as ST-3 (Yosemite Ave at White Dove Ave)	5/31/01	10:05	15	Traffic, Yosemite Ave: 2 lanes, undivided	61.7	81.1	36.3	41.1	54.1	65.6
ST-4	On athletic field grounds, Merced Tri College Center (on 6th Street, n/o Yosemite Ave., W/S). ≈200′ from Mic to CL of r-o-w. ≈35′ SE corner of Bldg TC-1 (temp. classrooms)	5/30/01	15:45	15	Traffic, G Street: 3 lanes on SB side, 1 lane NB w/ 12′ median	52.1	67.4	40.8	43.6	48.6	55.1
ST-5	Front yard area of 5024 Bellevue Rd., @ NE corner of Bellevue Rd & Golf Rd. Mic is ≈70′ from CL of Bellevue Rd, ≈30′ from house façade	5/30/01	16:20	15	Traffic, Bellevue: 2 lanes, undivided	52.5	66.6	38.6	41.6	46.1	56.1
ST-6	NW corner of Lake Rd & Dunn Rd. Mic ≈63′ from Lake Rd CL. Flush w/ side yard & drivewy, Adj. to 3763 N. Lake Rd	5/30/01	16:55	15	Traffic, Lake Road	58.7	79.1	31.6	35.1	42.6	62.1
ST-7	(same location as LT-2) 2897 Bellevue Rd, front lawn area, approx. Mic is ~flush w/ LT-1 Mic,	5/31/01	8:10	15	Traffic, Bellevue Rd: 2 lanes, undivided. Ambient: birds calling	57.1	73.8	31.3	36.1	47.6	59.6

Site ID	Measurement Location	Measurement Period				Measurement Results, dBA					
		Date	Start Time	Duration (minutes	Noise Sources	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}
	and ≈30′ from house façade. ≈75′ from Mic to CL Bellevue Rd										
ST-8	Merced Hills Golf Club, Adj. To Hole #8 (near entrance, ≈450′ from CL of Lake Rd	5/31/01	8:45	15	Traffic, Lake Rd, birds, golfers (at nearby hole), Lake Rd: 2 lanes, undivided. Very distant landscaping noise: leaf blower	45.2	62.1	29.0	37.6	42.6	48.1
ST-9	4787 N. Lake Rd, in front yard area, Mic ≈75′ CL of Lake Rd, ≈30′ from façade of house	5/31/01	9:15	15	Traffic, Lake Rd: 2 lanes, undivided. Ambient: resident's radio low	52.1	71.9	34.3	37.1	39.1	51.1
ST-10	NW corner of Lake Rd & Boardwalk Dr, adj. to several residences. Mic is ~flush w/ façade of 1 of them, front yard of other (3829 N. Lake Mic ≈110′ from CL Lake Rd)	5/31/01	9:40	15	Traffic, Lake Rd: 2 lanes, undivided. Ambient: 1 dog bark, birds chirping, rooster crowing	53.6	77.0	29.1	31.0	37.6	54.1
ST-11	994 Yosemite Ave at Paulsen Rd, Mic is ≈12′ in front of duplex units, no exterior living areas fronting on Yosemite Ave. Mic is ≈42′ from CL Yosemite Ave.	5/31/01	10:40	15	Traffic, Yosemite Ave: 2 lanes w/ center median. Distant construction noise	68.3	80.8	53.2	57.1	65.1	72.1

Site ID	Measurement Location	Measurement Period				Measurement Results, dBA					
		Date	Start Time	Duration (minutes	Noise Sources	L_{eq}	L_{max}	L_{min}	L_{90}	L_{50}	L_{10}
ST-12	Yosemite Ave at Perch Lane, NE corner adj. to 3518 Yosemite Ave (S.F.Resi.). Mic is ~flush w/ corner of house, ≈78′ from Yosemite Ave. CL	5/31/01	11:07	15	Traffic, Yosemite Ave: 2 lanes, undivided	57.5	74.8	30.4	34.1	42.6	62.1

Source: UC Merced 2002

4.10.2.3 Alternative 2, Yosemite Avenue - Existing Conditions

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action. As a result, the noise environment in the vicinity of the site would be identical to the conditions described above for the Proposed Action. Noise receptors would be the same rural residences along Lake Road as described above for the Proposed Action and additional homes to the south of Olive Avenue.

4.10.2.4 Alternative 3, Bellevue Ranch - Existing Conditions

The Bellevue Ranch Alternative site is located on land commonly referred to as the Bellevue Ranch north of the City of Merced. This alternative includes the already developed 104-acre Phase 1.1 Campus and a 706-acre Main Campus located along Bellevue Road, about 2 miles from the Phase 1.1 Campus. The University Community would be located to the west and south of the Main Campus under this alternative. A larger number of noise-sensitive residences are located on and adjacent to the Bellevue Ranch site, including homes to the east, southwest, and south of the site. Based on the noise monitoring survey, noise levels were measured to be about 61 dBA L_{dn} at a typical residential front yard set back from Bellevue Road. The eastern boundary of this alternative lies along Highway 59 which is a relatively lightly traveled roadway in this portion adjacent to the alternative site, although it does experience some volume of truck traffic associated with the County landfill located to the north of this alternate site.

4.10.2.5 Alternative 4, 2002 Proposed Project - Existing Conditions

The 2002 Proposed Project Alternative consists of a 910-acre UC Merced Campus and an adjacent 2,133-acre University Community located in eastern Merced County. This alternative site is generally east and south of Lake Yosemite and like the Proposed Action is bounded by Lake Road on the west and Yosemite Avenue on the south. Under this alternative, the noise environment and noise receptors in the vicinity of the site would be generally be the same as described above for the Proposed Action. However, this alternative is located closer to Lake Yosemite Regional Park than the Proposed Action.

4.10.3 APPLICABLE LAWS, REGULATIONS, AND POLICIES

The State of California and Merced County have each established plans and policies designed to limit noise exposure at noise-sensitive land uses. There are no federal noise requirements or regulations that bear directly on local actions of Merced County or the University. Additionally, since the Campus project is a state project and the University Community Plan (UCP) project is a county project, local regulations of the City of Merced are not applicable to the project at this time. However, if the Campus and the University Community were to be annexed to the City, the City of Merced regulations related to noise would be pertinent.

4.10.3.1 State Regulations

The pertinent State of California regulations are contained in the California Code of Regulations (CCR). Title 24 "Noise Insulation Standards" establish the acceptable interior community noise level for multifamily dwellings (and may be extended by local legislative action to include single-family dwellings). Section 65302(f) of the CCR establishes the requirement that local land use planning jurisdictions prepare a General Plan. The Noise Element is a mandatory component of the General Plan. It includes general community noise guidelines developed by the California Department of Health Services and specific planning guidelines for noise/land use compatibility developed by the local jurisdiction. The state guidelines recommend that the local jurisdiction consider adopting a local nuisance noise control ordinance.

The California Department of Health Services has developed guidelines (1987) for community noise acceptability for use by local agencies. Selected relevant levels are the following:

- CNEL below 60 dBA—normally acceptable for low-density residential use.
- CNEL of 55 to 70 dBA—conditionally acceptable for low-density residential use.
- CNEL below 65 dBA—normally acceptable for high-density residential use.
- CNEL of 60 to 70 dBA—conditionally acceptable for high-density residential, transient lodging, churches, educational and medical facilities.
- CNEL below 70 dBA—normally acceptable for playgrounds, neighborhood parks.

"Normally acceptable" is defined as satisfactory for the specified land use, assuming that normal conventional construction is used in buildings. "Conditionally acceptable" may require some additional noise attenuation or special study. Under most of these land use categories, overlapping ranges of acceptability and unacceptability are presented, leaving some ambiguity in areas where noise levels fall within the overlapping range.

The State of California additionally regulates the noise emission levels of licensed motor vehicles traveling on public thoroughfares, sets noise emission limits for certain off-road vehicles and watercraft, and sets required sound levels for light-rail transit vehicle warning signals. The extensive state regulations pertaining to worker noise exposure are for the most part applicable only to the construction phase of any project.

4.10.3.2 Merced County

Noise is addressed in Chapter IV (Noise) of the Year 2000 Merced County General Plan. Chapter IV, Section C, sets forth goals, objectives, policies, and implementation guidelines to assure land use compatibility with respect to noise. Among these objectives is that citizens of the county are not significantly impacted by excessive noise levels. New residential land uses and projects should be located where noise will not exceed an existing or projected future exterior noise level standard of 65 dBA L_{dn}, and an interior noise level standard of 45 dBA L_{dn}.

The exterior noise standard for hospitals and schools is 70 dBA L_{dn}. The Merced County Noise Element does not include a specific policy with respect to acceptable noise levels for parks; however, it refers to the State Land Use Compatibility Guidelines for noise, which note the acceptable noise level for parks to be 70 dBA L_{dn}.

The Merced County Zoning Code requires that no use shall create any disturbing ground vibration, heat, glare, and electrical disturbances based on typical human reaction beyond the boundaries of the site (Merced County Code Chapter 18.41.090).

Construction activity is exempt from the sound level limitations specified in the Noise Control Code, provided that all construction in or adjacent to urban areas is limited to the daytime hours between 7:00 AM and 6:00 PM, and all construction equipment is properly muffled and maintained. For construction occurring outside of these hours, the Code limits maximum noise levels from construction to 75 dBA L_{max} at any residential property or 80 dBA L_{max} at any non-residential property. The L_{dn} limit would not be applicable in this case because it is a day-night average noise level and the daytime construction activities would be considered exempt. The Code also specifies that no person shall generate a sound level that exceeds the background sound level by more than 10 dBA between the hours of 6:00 PM and 10:00 PM, or by more than 5 dBA L_{eq} between the hours of 10:00 PM and 7:00 AM

The Code also limits the an hourly average sound level not to exceed to be than 10 dBA L_{eq} above the ambient sound level between the hours of 6:00 PM and 10:00 PM, or an hourly sound level more than 5 dBA L_{eq} above the ambient sound level between the hours of 10:00 PM and 7:00 AM

4.10.3.3 City of Merced

Chapter 10 of the City of Merced's Vision 2015 General Plan identifies noisy areas and provides measures for protecting residents from the harmful effects of excessive noise. Policies and implementation actions are included to minimize the impacts of aircraft noise, reduce surface vehicle noise, reduce equipment noise levels, reduce noise levels at the receiver where noise reduction at the source is not possible,

coordinate planning efforts so that noise-sensitive land uses are not near major noise source, and mitigate all significant noise impacts as a condition of project approval for sensitive land uses. The City requires that new residential projects meet the following acceptable noise level standards:

- A maximum interior noise level of 45 dB
- A maximum exterior noise level of 60 dB, especially when outdoor activities are important components of the project
- A maximum exterior noise level of 65 dB when all the best available noise reduction techniques have been exhausted without achieving 60 dB and the strict application of such a maximum becomes a hindrance to development needed or typical for an area
- A maximum exterior noise level of 70 dB for rail noise when 45 dB is maintained in bedrooms and the accumulation of the total number of noisy events does not exceed 45 dB for more than 30 minutes during nighttime hours (11:00 PM to 7:00 AM) and does not exceed an accumulated 60 minutes in any 24 hour period

Although not specified in the policy text, it is assumed that the standards listed above are in reference to an L_{dn} or CNEL noise level, as indicated in Figure 10.6 of the general plan, Noise Compatibility Standards. Figure 10.6 also specifies that the exterior community noise exposure would be considered normally acceptable if noise levels do not exceed 60 dB L_{dn} for schools and libraries or 70 dB L_{dn} for playgrounds or neighborhood parks.

4.10.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment, which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. Impacts related to noise would be significant if implementation of the Proposed Action or its alternatives would:

- Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.
- Expose persons to or generate excessive ground borne vibration or ground borne noise levels.

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

- Be located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels.

- Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels.

Noise Standards and Thresholds used for Impact Evaluation

The County standard for residential land uses is 65 dBA L_{dn} for exterior noise levels and 45 dBA L_{dn} for interior noise levels. The County standard for exterior noise levels for land adjacent to schools is 70 dBA L_{dn}. The County refers to the State Land Use Compatibility Guidelines for the acceptable noise level at parks, which is listed as 70 dBA L_{dn}. The City standard for residential land uses is 60 dBA L_{dn} for exterior noise levels and 45 dBA L_{dn} for interior noise levels. Under City standards, the exterior community noise exposure would be considered normally acceptable if exterior noise levels do not exceed 60 dB L_{dn} for schools and libraries or 70 dB L_{dn} for playgrounds or neighborhood parks.

The previous EIRs used the County noise standards. However, if the Campus and the University Community were to be annexed to the City, the City of Merced regulations related to noise would also be applicable. As a result, where the City, County, and State thresholds differ, the most stringent of the three thresholds were used for this assessment. Thus, the thresholds for exterior noise levels of 60 dBA L_{dn} for residences, schools, and libraries, and 70 dBA L_{dn} for parks were used. The threshold for interior noise levels is 45 dBA L_{dn} for residences.

For purposes of evaluating the significance of the noise impacts, the following numeric thresholds were used:

- An increase in noise which causes the significance thresholds (60 dBA L_{dn} for residential and 70 dBA L_{dn} for parks) to be exceeded and the project results in an increase in noise of 3 dBA or more;

- An increase of 3 dBA where the resulting outdoor noise levels with the project are above the significance thresholds (60 dBA L_{dn} for residential and 70 dBA L_{dn} for parks);

- An increase of 5 dBA, where the noise levels without the project are 50 to 60 dBA L_{dn} for residential uses and the increase in noise from the project does not cause the significance thresholds to be exceeded; or

- An increase of 10 dBA, where noise levels without the project are less than 50 dBA L_{dn} for residential uses.

The increase in noise is based on comparing the Proposed Action (or a Build Alternative) and No Build conditions within the same time frame. A noise increase of 3 decibels is considered to be a perceptible increase and has been used as a standard in this EIS/EIR to evaluate impacts in areas where the ambient or background noise levels without the Proposed Action are close to or over the noise thresholds for affected land uses. Increases of 5 and 10 dB are used to evaluate noise impacts in areas where the ambient or background noise levels without the project are low or moderate. The use of this "sliding scale" is appropriate because where ambient/background levels are low an increase of 3 dBA may be perceptible but would not typically be enough to create an annoyance or nuisance. On the other hand, where the ambient/background noise levels are already moderately high, an increase of 3 dBA would exacerbate an existing noise problem and would increase the level of annoyance perceived by sensitive receptors.

The City of Merced does not have noise thresholds for construction noise. Merced County exempts noise from construction activity from the sound level limits, provided that all construction in or adjacent to urban areas is limited to the hours between 7:00 AM and 6:00 PM, and all construction equipment is properly muffled and maintained. County Ordinance 10.60.0303 would be applicable to construction occurring outside of these hours. The following ordinance thresholds were used to evaluate the significance of the construction noise impacts:

- Construction between the hours of 7:00 AM and 6:00 PM is exempt from the ordinance sound level limits and would be result in a less than significant noise impact.

- Construction between the hours of 6:00 PM and 10:00 PM would result in a significant construction noise impact if maximum noise levels exceed 75 dBA L_{max} at any residential property or 80 dBA L_{max} at any non-residential property or if construction activities result in a sound level that is more than 10 dB above the ambient sound level.

- Construction between the hours of 10:00 PM and 7:00 AM would result in a significant construction noise impact if maximum noise levels exceed 75 dBA L_{max} at any residential property or 80 dBA L_{max} at any non-residential property or if construction activities result in a sound level that is more than 5 dB above the ambient sound level.

4.10.5 METHODOLOGY FOR EVALUATING EFFECTS

The primary noise issues associated with the Proposed Action are the exposure of existing and proposed noise-sensitive land uses to short-term construction activities and noise from project related traffic and

changes in traffic patterns (long term). Secondary noise sources would be associated with daily activities on the Campus and within the University Community, such as noise from landscaping, mechanical equipment, recreational activities, and parking lot activities, and from special events at the Campus. Existing noise conditions are described based on information provided from previous studies and traffic noise modeling conducted using updated traffic data developed for this Draft EIS/EIR.

The Federal Highway Adminstration (FHWA) Traffic Noise Model (TNM v 2.5) is used for the traffic noise assessment. Noise modeling assumed soft ground type and did not take any shielding from barriers, structures, or terrain into account. Traffic noise was evaluated for the following scenarios and alternatives: 2008 Existing, 2030 No Build, 2030 No Action, 2030 Proposed Action, 2002 Proposed Project Alternative, 2030 Bellevue Ranch Alternative, and 2030 Yosemite Avenue Alternative. AADT traffic volumes, traffic speeds and percentages of automobiles, medium trucks, and heavy trucks were provided by Fehr & Peers Transportation Consultants for input into the traffic noise model.

4.10.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.10.6.1 Alternative 1 – Proposed Action

Alt 1– Impact NOI-1: Implementation of the Proposed Action would result in increased vehicular traffic on the regional road network, which would increase ambient traffic noise levels at existing off-site noise-sensitive uses. (*Significant; Significant and Unavoidable)*

Campus and Community

Development of the Proposed Action would increase traffic volumes on the local roadway network, which would result in increased traffic noise levels at noise-sensitive receptors located along these roadways. Project-generated noise increases were calculated by comparing project traffic conditions to no-project traffic conditions within the same time frame (i.e., 2030 No Build vs. 2030 Proposed Action). **Table 4.10-3, Predicted Traffic Noise Levels and Increases at a Distance of 100 feet from the Center of the Roadway**, summarizes the calculated L_{dn} noise levels at a distance of 100 feet from roadway links on the surrounding road network under 2008 Existing, 2030 No Build, and 2030 Proposed Action traffic conditions. The calculated traffic-generated noise increases, including the increase of 2030 No Build and 2030 Proposed Action over 2008 Existing conditions and the project-generated increase resulting from project traffic conditions under the same time period (i.e., 2030 No Build vs. 2030 Proposed Action), are also summarized. Calculations assume an ambient background noise level of about 50 dBA L_{dn} based on noise measurements conducted in areas located away from any major traffic or other noise sources.

As a part of the Proposed Action, a new roadway would be constructed to reroute Campus traffic from Lake Road. This roadway would parallel Lake Road and would be a segment of a regional loop road, Campus Parkway, that would skirt the eastern side of the City of Merced. The roadway within the project site would have 2 travel lanes in each direction and a 50-foot landscaped median. Based on a typical section of the roadway north of Dunn Road, there would be a 188-foot setback between the western edge of pavement of Campus Parkway and the eastern edge of pavement of Lake Road. Although there are no existing receptors along Campus Parkway alignment at this time, there are some existing receptors along Lake Road that would be exposed to traffic noise from a combination of traffic on Lake Road and traffic on Campus Parkway. Most homes on Lake Road are set back about 100 feet from the center of Lake Road and about 325 feet from the center of the Campus Parkway alignment. The resulting noise levels from traffic on Lake Road and Campus Parkway segments are indicated in **Table 4.10-3**.

Table 4.10-3
Predicted Traffic Noise Levels and Increases at a Distance of 100 feet from the Center of the Roadway

Road	Location	Modeled L_{dn} Noise Level, dBA[2]			Increase over 2008 Existing, dBA[1]		2030 Proposed Action Increase over 2030 No Build[1]
		2008 Existing	2030 No Build	2030 Proposed Action	2030 No Build	2030 Proposed Action	
Lake Road	South of Bellevue	55	55	55	0	0	0
Lake Road	South of Cardella	55	55	55	0	0	1
Campus Parkway	South of Bellevue	<50[4]	59	63	9[4]	13[4]	4
Campus Parkway	South of Cardella	<50[4]	63	64	13[4]	14[4]	1
Lake Road + Campus Parkway[3]	South of Bellevue	55	56	58	1	3	2
Lake Road + Campus Parkway[3]	South of Cardella	55	58	59	3	4	1
McKee	South of Yosemite	54	57	58	3	3	1
McKee	South of Olive	57	59	60	3	3	0
Yosemite Ave	East of SR 59	58	59	59	0	0	0
Yosemite Ave	East of G St	58	59	60	1	2	1
Yosemite Ave	West of Lake	55	57	60	2	4	3
Yosemite Ave	East of Lake	55	60	62	5	7	2
Yosemite Ave	East of Kibby	55	60	61	5	6	1
Yosemite Pkwy	West of Santa Fe Ave	57	56	58	-1	1	2
Yosemite Pkwy	East of Santa Fe Ave	60	61	63	1	3	2
Olive Ave	East of SR 59	61	62	62	1	1	0

Road	Location	Modeled L_{dn} Noise Level, dBA[2]			Increase over 2008 Existing, dBA[1]		2030 Proposed Action Increase over 2030 No Build[1]
		2008 Existing	2030 No Build	2030 Proposed Action	2030 No Build	2030 Proposed Action	
Olive Ave	West of G St	60	61	61	1	1	0
Olive Ave	East of G St	60	61	61	1	1	0
G St	South of Bellevue	57	61	62	4	5	0
G St	South of Cardella	57	60	61	3	4	1
G St	So. of Yosemite Ave	59	61	61	2	2	0
G St	South of Olive	61	62	62	1	1	0
M St	North of 23rd	58	58	59	0	0	0
M St	South of 23rd	58	58	58	0	0	0
SR 59	South of Belleview	59	61	61	1	1	0
SR 59	South of Cardella	61	62	63	2	2	0
SR 59	So. of Yosemite Ave	62	64	64	2	2	0
SR 59	South of Olive	59	61	61	3	3	0
Cardella Road	East of SR 59	51	52	53	1	2	1
Cardella Road	East of G St	51	57	62	6	11	5
16th St	West of SR 59	60	62	61	1	1	0
Kibby	So. of Yosemite Ave	53	53	58	1	5	5
Kibby	North of Yosemite		56	60	3	6	3
Parsons	North of Olive	54	56	56	2	3	1
Parsons	South of Olive	53	56	56	3	3	0
Bellevue	West of Lake	54	58	60	3	6	3
Bellevue	East of SR 59	53	58	59	6	6	1
Bellevue	West of SR 59	58	62	62	4	4	0
SR 140	West of Massasso	61	62	62	1	1	0
SR 99	North of 16th St	72	73	73	1	1	0
SR 99	North of M St	72	73	73	1	1	0
SR 99	So. of Yosemite Pkwy	71	72	72	1	1	0
SR 99	South of Mission Ave	71	72	72	2	2	0
Campus Pkwy	So. of Yosemite Ave	<50[4]	68	68	18[4]	18[4]	0
Campus Pkwy	South of Olive Ave	<50[4]	68	68	18[4]	18[4]	0

[1] *Discrepancies may occur due to rounding.*

[2] *Calculations assume an ambient background noise level of about 50 dBA L_{dn}.*

[3] *Noise level is calculated from the cumulative traffic noise resulting from Lake Road at a distance of 100 feet from the center of the roadway and Campus Parkway at a distance of 325 feet from the center of the roadway.*

[4] *Roadway segment does not exist under the given scenario.*

Increases that result in significant noise impacts are highlighted

The 2030 No Build and 2030 Proposed Action scenarios are predicted to result in traffic noise increases of up to 11 dBA above 2008 existing conditions along existing roadway segments. In addition, the construction of Campus Parkway could increase traffic noise levels by up to 18 dBA above noise levels without the roadway. However, these increases are primarily a result of cumulative traffic increases from background growth. The Proposed Action itself is predicted to result in traffic noise increases of 3 dBA or greater along six roadway segments, as indicated in **Table 4.10-3**. These are Campus Parkway south of Bellevue Road, Yosemite Avenue west of Lake Road, Cardella Road east of G Street, Kibby Road to the north and south of Yosemite Avenue, and Bellevue Road west of Lake Road. There are no noise-sensitive uses located along Kibby Road, north of Yosemite Avenue. Rural residences are located along the remaining identified roadway segments, at typical setbacks of 100 feet from the center of the roadway. The impacts along these roadways are summarized below:

- Noise levels along Yosemite Avenue west of Lake Road and along Bellevue Road west of Lake Road would increase by 3 dB due to the Proposed Action, but this increase combined with the increase in noise due to other traffic would not cause the ambient noise levels to exceed the 60 dBA L_{dn} residential threshold; therefore, the impact along these road segments would not be significant

- Noise levels along Kibby Road south of Yosemite Avenue are not predicted to exceed the 60 dBA L_{dn} residential threshold; however, increases of 5 dB are predicted at the residences. This increase is considered substantial and would constitute a significant impact.

- Noise levels along Cardella Road east of G Street are predicted to exceed the 60 dBA L_{dn} residential threshold at a distance of 100 feet from the center of the roadway under 2030 Proposed Action conditions, and the traffic associated with the Proposed Action is estimated to contribute between 4 and 5 decibels of noise that results in this exceedance; therefore, the impact is considered significant.

- As discussed above, residences on Lake Road south of Bellevue Road are located about 325 feet from the center of the Campus Parkway alignment and about 100 feet from the center of Lake Road. As indicated in **Table 4.10-3**, although noise levels along Campus Parkway are predicted to increase by 4 dBA as a result of the Proposed Action, the overall traffic noise levels at residences, resulting from traffic along both Lake Road and Campus Parkway, are predicted to increase by only 2 dBA as a result of the Proposed Action. This impact would not be significant.

- The Proposed Action is considered to result in significant traffic noise impacts at existing noise-sensitive receptors along Cardella Road east of G Street and Kibby Road south of Yosemite Avenue and at receptors in one approved development along Cardella Road. For new noise-sensitive land uses that are planned or approved along these segments in the future, noise impacts would be addressed by the environmental review process for those projects, which would consider all existing planned development, including the Proposed Action.

- Although the Proposed Action along with other regional growth would result in traffic that would increase noise levels along Campus Parkway south of Yosemite Avenue, the increase in noise levels would be the same under both No Build and Proposed Action conditions. Furthermore, there are no existing receptors along the Campus Parkway alignment at this time that would be affected by this increase. Therefore, this impact would be less than significant.

UCP Policy N 1.2 specifies that the project should "minimize transportation noise by the development of a grid street pattern with 'flexible corridors' that disperses local traffic and minimizes the need for major corridors carrying high volumes of traffic at high speeds and by integrating traffic calming measures into neighborhood street design." However, additional mitigation measures should be implemented to further reduce this impact.

MM NOI-1: For existing sensitive receptors that are predicted to be exposed to traffic noise increases that exceed the noise significance thresholds, project proponents shall commission a study, conducted by a qualified acoustical professional, to define reasonable and feasible noise mitigation, and shall implement the recommendations. Mitigation measures would include the following:

- Re-pave the streets with 'quiet' pavement types such as a porous Open-Grade Asphalt Concrete with fine aggregate size to reduce exterior noise levels to meet the noise thresholds (60 dBA L_{dn} for residences, schools, and libraries, and 70 dBA L_{dn} for parks). The effectiveness of this measure would depend on the existing pavement conditions along the roadway segment. Noise reductions of 3 to 4 dBA below the noise levels associated with 'average' pavements have been achieved using quiet pavement. (*Applicability – Campus and University Community*)

- In areas where 'quiet' pavement is not an option or would not reduce exterior noise levels to meet the noise thresholds, forced-air mechanical ventilation or building sound insulation such as sound-rated windows and doors would be provided to reduce interior noise levels in existing residences that are anticipated to exceed 45 dBA L_{dn} inside homes. This mitigation would be provided on a case-by-case basis and would typically be applicable in rural areas where the construction of sound barriers or the use of 'quiet' pavement is not found to be feasible and interior noise levels inside residences are anticipated to exceed 45 dBA L_{dn}. (*Applicability – Campus and University Community*)

Significance after Mitigation: Although measures are provided to reduce noise levels at existing sensitive receptors that would be affected, it is unlikely that in all cases mitigation would be available to reduce these impacts to a less than significant level. Therefore, the impact from project-related traffic noise is considered significant and unavoidable.

Alt 1 – Impact NOI-2: Daily operations within the Campus and University Community and special events at the Campus could expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels. (*Potentially Significant; Significant and Unavoidable*)

Campus and Community

Daily noise-generating activities on the campus would include student gatherings and conversations, athletic and recreational activities, social events, landscaping and maintenance activities, on-site traffic, and mechanical equipment noise. Noise generated by daily campus activities is not expected to exceed the noise standard of 60 dBA L_{dn} exterior and 45 dBA L_{dn} interior at off-site residential locations or 70 dBA L_{dn} at parks because the noise levels generated by these activities are generally low at the source and would be further attenuated by the distance between the Campus facilities and the nearest off-site receptors, including the regional park. Similarly, daily activities within the University Community would generate noise levels that are not expected to exceed the noise standards for residential and park uses at the nearest off-site receptors.

On-site noise-sensitive receptors, including student housing and academic buildings on the Campus and housing and parks within the University Community, could be exposed to excessive noise from other land uses that are developed within the Campus and the University Community. For instance, noise levels could be elevated in the Gateway District of the Campus and University Community from the operation of commercial-grade heating, ventilation, and air conditioning (HVAC) systems for large office and research facilities. However, the land use plans for the Campus and Community North have been designed to avoid the location of sensitive land uses near potential loud noise sources. Furthermore, noise levels associated with typical commercial grade HVAC systems can be reduced to below the noise standard for residences and parks at a distance of less than 50 feet from the source with the use of standard attenuation barriers. Therefore, on-site receptors are not expected to be exposed to noise levels in excess of the standards for noise-sensitive uses, and the impact is considered less than significant.

The 2009 LRDP includes the development of a multi-purpose stadium in the western portion of the Campus near its interface with the University Community. Although this stadium has not been designed at this time, it is expected to be an open stadium that would hold up to 20,000 spectators. It is anticipated that the multi-purpose stadium would be used for events such as graduation, large sporting events, festivals, dance and music performances, fairs, etc. A noise assessment conducted for a similar stadium at the University of California at Davis estimated that during events noise levels would be about 56 dBA L_{eq} at a distance of 1,000 feet (UC Davis 2003). The closest off-site sensitive receptors are located more than 1,000 feet from the proposed location of the stadium on the UC Merced Campus and would be well

shielded from stadium noise by the campus buildings that would be constructed between the stadium and these homes. Some campus housing is proposed adjacent to the stadium, and noise levels at these on-site receptors during events could exceed the noise thresholds. This impact is considered potentially significant.

Conclusion

In summary, existing off-site sensitive receptors would not be affected by noise generated by on-site noise sources, including HVAC equipment installed on large buildings a multi-purpose stadium on the Campus. However, sensitive land uses within the Campus and Community North could potentially be close to these noise sources and could be affected by noise generated at these facilities. This would be a potentially significant impact. The following mitigation measures are proposed to address this impact.

MM NOI-2a: In areas where new noise-generating Campus or Community uses are proposed adjacent to or integrated with noise-sensitive uses within the Campus or Community North, the project proponents shall retain a qualified acoustical consultant to prepare a design-level study to define reasonable and feasible noise mitigation to reduce noise levels to comply with noise standards. The identified mitigation shall be included in the design of the project. Measures that can be implemented to achieve this include but are not limited to:

- Using site planning to minimize noise in noise-sensitive areas by locating noise-generating operations in areas that are set back or acoustically shielded from noise-sensitive uses.
- Incorporating appropriate noise controls so that mechanical equipment from proposed uses does not generate noise levels in excess of 60 dBA L_{dn} at residential façades.
- Limiting the hours of noise-generating activities, such as maintenance, loading and unloading, and drive-through operations, to 7:00 AM to 10:00 PM, where potential noise conflicts exist. (*Applicability – Campus and Community*)

MM NOI-2b: Noise considerations shall be taken into account during the design of the multi-purpose stadium and any other noise-generating event facilities. The project proponents shall perform a design-level study, conducted by a qualified acoustical professional, during the project level analysis to define reasonable and feasible noise mitigation for noise-sensitive receptors that are predicted to be exposed to noise levels that exceed the noise significance thresholds (60 dBA L_{dn} for residences, schools, and libraries, and 70 dBA L_{dn} for parks). (*Applicability – Campus and Community*)

Significance after Mitigation: Mitigation Measure NOI-2a would reduce the impact of typical operational noise sources to a less than significant level. Impacts associated with Campus events would be assessed at the time when the individual facilities are proposed. For indoor facilities, **Mitigation Measure NOI-2b** would reduce this impact to a less than significant level. However, if the multi-purpose stadium or other similar facilities are proposed to be open to the outdoor environment, it is not certain that mitigation would be feasible to reduce the noise impact to a less than significant level in all cases because aesthetic considerations and usability of the space may make the noise thresholds unachievable. As a result, the impact from special event venue noise is considered potentially significant and unavoidable.

Alt 1 – Impact NOI-3: Construction of the Proposed Action could expose existing off-site and future on-site noise-sensitive receptors to elevated noise levels. (*Potentially Significant; Less than Significant)*

Campus and Community

Intermittent construction of the Proposed Action would occur over several decades and would include ground clearing, earthmoving, foundations, erection of structures, and finishing. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance and shielding between construction noise sources and noise-sensitive areas. **Table 4.10-4, Construction Equipment Noise Emission Levels**, summarizes noise levels produced by commonly used construction equipment. Individual types of construction equipment are expected to generate noise levels ranging from 74 to 89 dBA at a distance of 50 feet.

Noise generated by construction is anticipated to be greatest during site grading activities and excavation for underground utilities. Noise generated during foundation and building construction would be lower. Maximum noise levels at a distance of 50 feet from the source would typically range from 70 to 90 dBA during excavation and grading activities and from 65 to 85 dBA during building construction. Hourly average construction noise levels measured at a distance of 50 feet from the center of the site are typically 75 dBA to 85 dBA during busy construction periods. Construction noise levels decrease at a rate of about 6 dBA per doubling of distance between the source and receptor. Shielding by buildings or terrain often results in much lower construction noise levels at distant receptors.

Table 4.10-4
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 feet from Source
Grader	85
Bulldozers	85
Truck	88
Loader	85
Roller	74
Air Compressor	81
Backhoe	80
Pneumatic Tool	85
Paver	89
Concrete Pump	82

Source: Federal Transit Administration 2006.

Noise Impacts from On-site Construction

The closest noise-sensitive receptors to the project site include residences along Lake Road to the west, Lake Yosemite Regional Park to the north, and scattered residences to the east and south. Residences along Lake Road are located within about 150 feet of the project site's western boundary. The park is located more than 700 feet to the north of the project site's northern boundary and more than 1,000 feet from areas of the campus that are not already developed as part of Phase 1.1 Campus. During the noise monitoring survey, ambient daytime noise levels at these receptors were measured to be about 45 to 59 dBA L_{eq} at the residences along Lake Road and about 44 to 48 dBA L_{eq} at Lake Yosemite Regional Park.

Hourly average construction noise levels would typically range from 65 to 75 dBA at a distance of 150 feet from the center of construction activities, from 55 to 65 dBA at a distance of 500 feet, and from about 49 to 59 dBA at a distance of 1,000 feet, not taking into account shielding from buildings or terrain. Maximum noise levels would typically range from 60 to 80 dBA at a distance of 150 feet, from 50 to 70 dBA at a distance of 500 feet, and from 44 to 64 dBA at a distance of 1,000 feet. As discussed earlier in this section, daytime construction noise would be exempt from the County's ordinance and a significant impact would occur if construction activity is predicted to result in maximum noise levels exceeding 75 dBA L_{max} at any residential property or 80 dBA L_{max} at any non-residential property between the hours of 6:00 PM and 7:00 AM, an hourly average sound level that is more than 10 dBA L_{eq} above the ambient sound level between the hours of

6:00 PM and 10:00 PM, or an hourly sound level more than 5 dBA L_{eq} above the ambient sound level between the hours of 10:00 PM and 7:00 AM. Maximum noise levels are predicted to exceed 75 dBA within 300 feet from construction activities. Construction located within 500 feet of residences is predicted to increase ambient sound levels at residences by 5 dB or more and construction within 300 feet of residences is predicted to increase ambient sound levels at residences by 10 dB or more.

Some of the off-site residences along Lake Road would be located within 500 feet of certain phases of Campus and University Community construction in the western portion of the Campus and the University Community, and a few off-site residences along the south side of Yosemite Avenue would be located less than 500 feet from some phases of construction of Community South. In addition, as residences are constructed as part of the University Community, occupants of these residences would be exposed to high noise levels from construction of later phases of the Campus and the University Community. Construction occurring within 300 feet of residences between the hours of 6:00 PM and 10:00 PM and within 500 feet of residences between the hours of 10:00 PM and 7:00 AM would result in a significant noise impact.

There is no policy in the 2009 LRDP that would limit the hours of construction on the campus. Therefore, a mitigation measure is required to reduce and avoid significant noise impacts from construction activities on the campus. Construction within the University Community would be required to comply with UCP Policy N 2.6, which limits the hours of construction activities that generate noise when adjacent to housing and other "sensitive" uses, to the hours of 7:00 AM to 8:00 PM weekdays and Saturday, and prohibits construction on Sundays and holidays. However, it is recommended that additional mitigation measures be implemented to further reduce this impact.

Noise Impacts from Off-Site Construction

Providers of utilities to the Campus and University Community would construct off-site utility connections and infrastructure improvements, which would include installation of electrical lines, gas pipelines, sewer and potable water lines, and possibly roadway improvements. For linear projects such as these, the zone of potential noise impacts is continuously moving during the project's construction phase. Generally, the noisiest activities come and go (from the standpoint of a fixed noise-sensitive receiver) within a few days. Construction-phase noise would primarily result from the use of motorized construction equipment. Other short-term impacts from construction noise could result from construction traffic, including materials delivery. Noise impacts would be most noticeable in residential areas in the vicinity of project construction locations. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Standard excavation and installation equipment, such as graders, backhoes, loaders, side-boom tractors, welders, and trucks, would be used for construction of most project facilities.

Off-site utility improvements to serve Campus and University Community development would potentially involve (1) construction of a trunk sewer either along Cardella Road or along Yosemite Avenue or construction of a new gravity sewer along Campus Parkway; and (2) construction of a 115-kilovolt (kV) power line either along Yosemite Avenue and the on-site Campus Parkway segment, or along Cardella Road up to the project site, or along Campus Parkway from the vicinity of Highway 140. Existing residential receptors along these existing and future roadways could be affected by the construction noise associated with the off-site utilities. Based on the UC Merced 2002 LRDP EIR, which discussed noise levels generated by installation of a buried 12-foot-diameter reinforced concrete pipe, the noise associated with infrastructure construction would not exceed 80 dBA L_{eq} at a distance of 50 feet. Noise levels from construction operations decrease at a rate of approximately 6 dBA per doubling of distance between the source and receptor. Therefore, at a distance of 100 feet (which is approximately the distance from many of the existing noise-sensitive land uses to the edges of the roadways), noise levels from pipeline construction would be approximately 74 dBA L_{eq} or less. The noise levels from construction of utilities are predicted to be 5 dBA higher than existing noise levels and thus clearly audible. Construction activities would be limited to between the hours of 7:00 AM and 6:00 PM and the duration of construction adjacent to any individual receptors would be short. Construction taking place between the hours of 7:00 AM and 6:00 PM is exempt from the County's Ordinance. Therefore, this is a less than significant impact.

Conclusion

In summary, construction activities occurring between the hours of 6:00 PM and 7:00 AM would result in significant noise impacts. Although daytime construction activities would not result in significant noise impacts as defined by the noise thresholds, because of the longer durations and higher noise levels that potentially could be involved in the construction of facilities within the Campus and the University Community, it is recommended that standard noise reduction techniques be used to further reduce the noise exposure of nearby noise-sensitive receptors to construction noise. **Mitigation Measure NOI-3** is proposed to reduce the noise impact from nighttime construction and to further minimize the less than significant impact from daytime construction.

MM NOI-3: Prior to initiation of campus or community construction, the project proponents shall approve a construction noise mitigation program including but not limited to the following.

- Construction activities within 500 feet of any residences shall be restricted to between the hours of 7:00 AM and 6:00 PM on weekdays and Saturdays with no construction on Sundays and holidays.

- All noise-producing project equipment and vehicles using internal combustion engines shall be equipped where appropriate with exhaust mufflers and air-inlet silencers in good operating condition that meet or exceed original factory specifications.

- Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.

- All mobile or fixed noise-producing equipment used on the project that is regulated for noise output by local, state or federal agency shall comply with such regulation while engaged in project-related activities.

- Electrically powered equipment shall be used instead of pneumatic or internal combustion powered equipment, where practicable.

- Material stockpiles, mobile equipment staging, construction vehicle parking, and maintenance areas shall be located as far as practicable from noise-sensitive land uses.

- Stationary noise sources such as generators or pumps shall be located away from noise-sensitive land uses as feasible.

- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. No project-related public address loudspeaker, two-way radio, or music systems shall be audible at any adjacent noise-sensitive receptor except for emergency use.

- The erection of temporary noise barriers shall be considered where project activity is unavoidably close to noise-sensitive receptors.

- The noisiest construction operations shall be scheduled to occur together to avoid continuing periods of the greatest annoyance, wherever possible.

- Construction vehicle trips shall be routed as far as practical from existing residential uses.

- The loudest campus construction activities, such as demolition, blasting, and pile driving, shall be scheduled during summer, Thanksgiving, winter, and spring breaks when fewer people would be disturbed by construction noise.

- Whenever possible, academic, administrative, and residential areas that will be subject to construction noise shall be informed a week before the start of each construction project. (*Applicability – Campus and University Community*)

Significance after Mitigation: Construction noise impacts at existing noise-sensitive uses would be reduced to a less than significant level with the implementation of **Mitigation Measure NOI-3**.

Alt 1 – Impact NOI-4: Pile driving activities during construction could expose nearby receptors to perceptible levels of groundborne vibration. (*Potentially Significant; Less than Significant*)

Vibration levels generated by construction activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used. Typical project construction activities would not generate substantial levels of vibration. Pile driving is not anticipated for the Proposed Action due to the geology that is typical for Merced County. However, in the event that pile driving is required during construction, it could produce groundborne vibration levels that might be perceptible to nearby sensitive receptors.

County Code 18.41.090 specifies that no use shall create any disturbing ground vibration based on typical human reaction beyond the boundaries of the site, but does not provide specific vibration thresholds. However, the US Department of Transportation suggests a vibration damage threshold of 0.50 inch/second of peak particle velocity (ppv) for reinforced buildings, 0.20 inch/second for non-engineered timber and masonry buildings, and 0.12 inches/second for buildings extremely susceptible to vibration damage (Federal Transit Administration 2006). The Transportation Research Board (Transportation Research Board 1997) suggests maximum allowable peak particle velocities from pile driving for various structure types and conditions. **Table 4.10-5, Transportation Research Board Building Structure Vibration Criteria**, summarizes these values. For the purposes of this assessment, pile driving will be considered to result in a significant ground vibration impact if fragile or historic building structures would be exposed to ground vibration in excess of 0.20 inch/second or if other building structures would be exposed to ground vibration in excess of 0.50 inch/second.

Table 4.10-5
Transportation Research Board Building Structure Vibration Criteria

Structure and Condition	Limiting PPV (in/sec)
Historic and some old buildings	0.2
Residential structures	0.5
New residential structures	1.0
Industrial buildings	2.0
Bridges	2.0

Source: Transportation Research Board 1997

Based on past studies (Wiss 1981), at a distance of 50 feet, impact pile drivers typically generate vibration levels of 0.48 inch/second, ppv and vibratory pile drivers typically generate vibration levels of 0.23 inches/second, ppv. The Federal Transit Administration (FTA) provides estimates of ground vibration, given the wide range of soil conditions that could occur, generated by various pieces of construction equipment. Based on the FTA estimates, at a distance of 25 feet, impact pile drivers typically generate vibration levels of 0.644 inch/second, ppv, with an upper range of 1.518 inches/second, ppv, and vibratory pile drivers typically generate vibration levels of 0.170 inch/second, ppv, with an upper range of 0.734 inch/second, ppv (Federal Transit Administration 2006). Based on the calculation methods recommended in the FTA document, impact pile drivers are estimated to generate an upper range of 0.537 inch/second, ppv, at a distance of 50 feet and vibratory pile drivers are estimated to generate an upper range of 0.260 inches/second, ppv. At a distance of 100 feet, impact pile drivers are estimated to generate an upper range of 0.190 inches/second, ppv, and vibratory pile drivers are estimated to generate an upper range of 0.092 inch/second, ppv. Groundborne vibration levels at distances of approximately 100 feet or more would not result in vibration levels exceeding 0.20 inch/second, ppv and would not, therefore, be anticipated to result in substantial effects, although vibration levels would be anticipated to be perceptible within about 650 feet. Impact pile driving within 50 feet of structures could cause structural damage to typical building structures. Vibration from pile driving occurring within 100 feet could cause architectural and structural damage to unreinforced or older buildings, which are not present on the site. If distances of 50 feet or more are observed for pile driving, no undue annoyance to persons or damage to existing structures is expected to occur at most locations from construction pile driving. However, at a few future campus facilities, such as laboratories, additional precautions may be needed to prevent adverse effects from vibration. This is a potentially significant impact. The following mitigation measures are included to address this impact.

MM NOI-4a: The project proponents shall avoid impact pile driving where possible in vibration-sensitive areas. Drilled piles or the use of vibratory pile driving will be used where geological conditions permit their use. For impact pile driving activities occurring within 50 feet of typical structures, limit groundborne vibration due to construction activities to 0.50 inch/second, ppv (limit of potential for damage to typical structures) in the vertical direction at sensitive receptors. Since in many cases the information available during the preliminary engineering phase would not be sufficient to define specific vibration mitigation measures, the project proponents shall describe and commit to a mitigation plan to minimize construction vibration damage using all feasible means available. Thresholds for individual structures could be established based on the assessment of each structure's ability to withstand vibration, and vibration monitoring could be

conducted to ensure compliance with the vibration thresholds. (*Applicability – Campus and University Community*)

MM NOI-4b: For construction adjacent to highly sensitive uses such as laboratories, apply additional measures as feasible, including advance notice to occupants of sensitive facilities to ensure that precautions are taken in those facilities to protect ongoing activities from vibration effects. (*Applicability – Campus and Community North*)

Significance after Mitigation: With the implementation of the proposed mitigation measures, the impact would be reduced to a less than significant level.

Alt 1 – Impact NOI-5: New on-site noise-sensitive land uses, such as Campus and University Community residences, could be exposed to noise levels exceeding noise thresholds. (*Potentially Significant; Less than Significant*)

Campus and Community

The existing ambient noise environment at the project site is generally below the applicable noise compatibility standard of 60 L_{dn} for residences. However, with construction of the Proposed Action, noise-sensitive uses could be developed adjacent to existing noise-generating uses, including traffic along Lake Road and Yosemite Avenue, recreational activities at Lake Yosemite Regional Park, agricultural operations, and the private airstrip located adjacent to Community South. In addition, noise-sensitive uses could be developed adjacent to new noise-generating components of the Proposed Action, including Campus Parkway and other project roadways, the multi-purpose stadium and arena area, and other campus facilities that could include noise-generating mechanical equipment such as cooling towers. A discussion of noise levels generated by daily activities and the multi-purpose stadium is included under **Impact NOI-2**. The analysis below focuses on exposure of on-site sensitive land uses to elevated noise levels associated with on-site and adjacent roadways, recreational activities at the regional park, and agricultural operations, including the operation of the adjacent air strip for agricultural purposes.

On-Site and Adjacent Roadways

As described under **Impact NOI-1**, a section of the Campus Parkway within the Campus and University Community sites would be constructed as a part of the Proposed Action to reroute project-related traffic from Lake Road. This section of Campus Parkway would have 2 travel lanes in each direction and a 50-foot landscaped median. For a typical section north of Dunn Road, there would be a 188-foot setback between the western edge of pavement of Campus Parkway and the eastern edge of pavement of Lake Road. Additional roadways, including Bellevue Road, Community Access Road, Dunn Road, and

Cardella Road, would be extended east of Lake Road through the Campus and the University Community.

Noise levels generated by roadways in the project area are indicated in **Table 4.10-6, Predicted Traffic Noise Levels at a Distance of 100 feet from the Center of the Roadway and Predicted Traffic Noise Contour Distances**, under future plus Proposed Action conditions. These noise levels were modeled assuming a soft ground surface and not taking into account any shielding from intervening structures or terrain. The 70 dBA L_{dn} contour distance for all campus roadway segments would be within 70 feet of the center of the roadway. At a typical setback of University Community homes from Campus Parkway south of the Community Access Road, 18 feet from the edge of pavement and 75 feet from the center of the roadway, noise levels are anticipated to be about 68 dBA L_{dn} and therefore the noise levels would exceed the threshold for residential uses. Noise levels at residential setbacks along the remaining roadways would typically be below 60 dBA L_{dn} and would meet the noise thresholds for residential uses. Traffic noise levels at the planned high school, which would be located about 600 feet from Campus Parkway, would be about 55 dBA L_{dn} and would meet the noise thresholds for schools.

Based on the above, although along most roadways the noise generated by project traffic would not exceed the thresholds for residential and school uses, along Campus Parkway between Yosemite Avenue and Bellevue Road, the noise levels would exceed the threshold for residential uses within a distance of about 280 feet from the center of the roadway. This is a potentially significant impact. **Mitigation Measure NOI-5a** is proposed to address this impact.

Lake Yosemite Regional Park

Merced County General Plan documents that certain ski boats cause noise levels of up to 67 dBA within 1,000 feet. Noise from farm equipment due to agricultural operations on surrounding lands is generally less intense. The land use plans for the Campus and Community North have been designed to avoid the location of sensitive land uses near potential loud noise sources. The Proposed Action would place noise-sensitive receptors at a distance of about 2,000 feet from Lake Yosemite, which would result in a calculated ski boat noise level of about 61 dBA without considering the shielding that is provided by intervening structures or terrain. An exceedance of the noise thresholds by ski boat noise or occasional agricultural noise is unlikely due to the typically intermittent nature of these noise sources. Therefore, on-site receptors are not expected to be exposed to noise levels in excess of the standards for noise-sensitive uses, and the impact is considered less than significant.

Table 4.10-6
Predicted Traffic Noise Levels at a Distance of 100 feet from the Center of the Roadway and Predicted Traffic Noise Contour Distances

Road	Location	Modeled L_{dn} at 100 feet from Center of Road, dBA	Distance to L_{dn} Contour, feet		
			60 dBA L_{dn}	65 dBA L_{dn}	70 dBA L_{dn}
Campus Parkway	Yosemite Ave to Dunn Road	67	280	130	[1]
	Dunn Road to Cardella Road	66	270	120	[1]
	Cardella Road to Community Access Road	66	270	130	[1]
	Community Access Road to Bellevue Road	64	180	90	[1]
	North of Bellevue Road	54	[1]	[1]	[1]
Yosemite Ave	Lake Road to Campus Pkwy	59	80	[1]	[1]
	East of Campus Pkwy	59	90	[1]	[1]
Dunn Road	East of Campus Pkwy	52	[1]	[1]	[1]
Cardella Road	East of Campus Pkwy	58	[1]	[1]	[1]
Community Access Road	East of Campus Pkwy	60	100	[1]	[1]
Bellevue Road	East of Campus Pkwy	54	[1]	[1]	[1]

[1] *Distances less than 70 feet are not included in this table.*

Adjacent Agricultural Operations

Lands within Community South and lands to the south and east of Community South are cultivated and agricultural operations in these areas produce elevated noise levels during certain times of the year. Sensitive land uses, primarily residential uses, within Community North could be exposed to noise generated by agricultural operations on Community South in the event that Community North residential uses develop before the development of Community South. Once Community South is developed with residential uses, those uses would be exposed to periodic noise from adjacent agricultural operations to the south of Yosemite Avenue and east of Community South. Furthermore, a private airstrip is located east of the University Community South. Although it is used infrequently (for agricultural uses), depending on frequency of airstrip operations, overflights from the adjacent airstrip could result in excessive noise levels in Community South. This is a potentially significant impact.

MM NOI-5a: For new noise-sensitive Campus and University Community development, noise considerations shall be taken into account during initial site planning, in order to maximize shielding by the planned structures or other on-site features. In areas where new residential development or noise-sensitive park uses would be developed adjacent to noise-generating project development or along Campus Parkway, the project proponent shall retain a qualified acoustical professional to prepare a design level study to define reasonable and feasible noise mitigation to reduce exterior and interior noise levels in noise-sensitive areas to comply with the land use compatibility guidelines (60 dBA L_{dn} exterior and 45 dBA L_{dn} interior for residences). The identified mitigation shall be included in the design of the project. Measures that can be implemented to achieve reductions in noise levels include but are not limited to:

- Using site planning to minimize noise in parks and residential outdoor activity areas by locating these areas as far as possible from noise sources or at locations behind buildings.
- Paving Campus Parkway section within the project site with a 'quiet' pavement type such as a porous Open-Grade Asphalt Concrete with fine aggregate size. Noise reductions of 3 to 4 dBA below noise levels associated with 'Average' pavements have been achieved using a 'quiet' pavement.
- Using noise barriers or berms to acoustically shield these uses where site planning methods are not sufficient to reduce noise in noise-sensitive exterior use areas to below 60 dBA L_{dn}.
- Providing mechanical ventilation so that windows can remain closed to maintain interior noise levels below 45 dBA L_{dn} where exterior noise levels at residential façades are predicted to exceed 60 dBA L_{dn}.
- Providing sound-rated windows and applying other noise-reducing construction methods where exterior noise levels at residential facades are predicted to exceed 65 dBA L_{dn}. (*Applicability – Campus and University Community)*

MM NOI-5b: Noise considerations shall be taken into account during the design of residences to ensure that airstrip or other agricultural operations do not adversely affect residents. During the project level analysis, the project proponents shall perform a design level study, conducted by a qualified acoustical professional, to define reasonable and feasible noise mitigation for noise-sensitive receptors that are predicted to be exposed to noise levels that exceed the noise significance thresholds. Potential aircraft noise could be addressed through siting, building design and construction, and/or working with the airstrip owner to modify hours of operation and/or flight patterns. (*Applicability – Community University*)

Significance after Mitigation: Mitigation Measures NOI-5a and 5b would reduce this impact to a less than significant level.

4.10.6.2 Alternative 2 – Yosemite Avenue

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action. However, under this alternative, campus development would be located in the already developed 104-acre Phase 1.1 Campus and a 710-acre area located south of the Phase 1.1 Campus. The University Community would be located both north and south of Yosemite Avenue. Under this alternative, traffic, operational, and construction impacts would be similar to the Proposed Action.

Increase in Ambient Traffic Noise Levels

Table 4.10-7, Predicted Traffic Noise Levels and Increases at a Distance of 100 feet from the Center of the Roadway, (located at the end of this section) summarizes the calculated L_{dn} noise levels at a distance of 100 feet from roadway links on the surrounding road network under 2030 Yosemite Avenue Alternative traffic conditions. The calculated traffic noise increases, including the increase of the alternative over 2008 existing conditions and the alternative-generated increase resulting from the alternative traffic conditions under the same time period (i.e., 2030 No Build vs. 2030 Alternative) are also summarized. Calculations assume an ambient background noise level of about 50 dBA L_{dn} based on noise measurements conducted in areas located away from any major traffic or other noise sources. As the table shows, off-site noise impacts from traffic associated with the Yosemite Avenue Alternative would be identical to the impacts from traffic associated with the Proposed Action. Although **Mitigation Measure NOI-1** would reduce noise levels at existing sensitive receptors that would be affected, it is unlikely that in all cases mitigation would be available to reduce these impacts to a less than significant level. Therefore, the impact from project-related traffic noise is considered significant and unavoidable.

Exposure to Noise from Daily Operations and Special Events

Existing off-site sensitive receptors would not be affected by noise generated by on-site noise sources, including HVAC equipment installed on large buildings, or a multi-purpose stadium on the campus. However, sensitive land uses within the Campus and Community North could potentially be close to these noise sources and could be affected by noise generated at these facilities. This would be a potentially significant impact.

Mitigation Measure NOI-2a would reduce the impact of typical operational noise sources to a less than-significant level. For indoor facilities, **Mitigation Measure NOI-2b** would reduce this impact to a less than significant level. However, if the multi-purpose stadium or other similar facilities are proposed to be

open to the outdoor environment, it is not certain that mitigation would be feasible to reduce the noise impact to a less than significant level in all cases because aesthetic considerations and usability of the space may make the noise thresholds unachievable. As a result, the impact from special event venue noise is considered potentially significant and unavoidable.

Exposure to Noise from Construction

On- and off-site construction activities occurring between the hours of 8:00 PM and 7:00 AM would result in a significant noise impact. Although daytime construction activities would not result in significant noise impacts as defined by the noise thresholds, because of the longer durations and higher noise levels that potentially could be involved in the construction of facilities within the Campus and the University Community, it is recommended that standard noise reduction techniques be used to further reduce the noise exposure of nearby noise-sensitive receptors to construction noise. Implementation of **Mitigation Measure NOI-3** would reduce the noise impact from nighttime construction and further minimize the less than significant impact from daytime construction.

Exposure to Groundborne Vibration

Vibration levels generated by construction activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used. Typical project construction activities would not generate substantial levels of vibration. Pile driving is not anticipated for the Yosemite Avenue Alternative due to the geology that is typical for Merced County. However, in the event that pile driving is required during construction, it could produce groundborne vibration levels that might be perceptible to nearby sensitive receptors. Implementation of **Mitigation Measures NOI-4a** and **NOI-4b** would reduce this impact to a less than significant level.

Exceed Noise Standards

The existing ambient noise environment at the project site is generally below the applicable noise compatibility standard of 60 L_{dn} for residences. However, with construction of the Yosemite Avenue Alternative, noise-sensitive uses could be developed adjacent to existing noise-generating uses, including traffic along Lake Road and Yosemite Avenue, recreational activities at Lake Yosemite Regional Park, agricultural operations, and the private airstrip located near Community South. In addition, noise-sensitive uses could be developed adjacent to new noise-generating components of the Yosemite Avenue Alternative, including project roadways, the multi-purpose stadium and arena area, and other campus facilities that could include noise-generating mechanical equipment such as cooling towers. Implementation of **Mitigation Measures NOI-5a** and **NOI-5b** would reduce impacts related to on-site and adjacent roadways, parks, and airstrip and agricultural operations to a less than significant level.

4.10.6.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch Alternative site is located on land commonly referred to as Bellevue Ranch, north of the City of Merced. Under this alternative, Campus development would be located in the already developed 104-acre Phase 1.1 Campus and a 710-acre campus located along Bellevue Road, about 2 miles from the Phase 1.1 Campus.

Increase in Ambient Traffic Noise Levels

Table 4.10-7 summarizes the calculated L_{dn} noise levels at a distance of 100 feet from roadway links on the surrounding road network under 2030 Bellevue Ranch Alternative traffic conditions. Calculations assume an ambient background noise level of about 50 dBA L_{dn} based on noise measurements conducted in areas located away from any major traffic or other noise sources. Alternative 3 traffic would not cause the noise significance thresholds to be exceeded along Kibby Road north of Yosemite Avenue, or along Cardella Avenue east of G Street. However, Alternative 3 traffic would cause the noise significance thresholds to be exceeded along Bellevue Road west of SR 59, where some existing residences are located. Although **Mitigation Measure NOI-1** would reduce noise levels at existing sensitive receptors that would be affected, it is unlikely that in all cases mitigation would be available to reduce these impacts to a less than significant level. Therefore, the impact from project-related traffic noise is considered significant and unavoidable.

Exposure to Noise from Daily Operations and Special Events

Existing off-site sensitive receptors and sensitive land uses within the Campus and University Community could potentially be affected by noise generated by on-site noise sources, including HVAC equipment installed on large buildings or a multi-purpose stadium on the campus. This would be a potentially significant impact.

Mitigation Measure NOI-2a would reduce the impact of typical operational noise sources to a less than significant level. For indoor facilities, **Mitigation Measure NOI-2b** would reduce this impact to a less than significant level. However, if the multi-purpose stadium or other similar facilities are proposed to be open to the outdoor environment, it is not certain that mitigation would be feasible to reduce the noise impact to a less than significant level in all cases because aesthetic considerations and usability of the space may make the noise thresholds unachievable. As a result, the impact from special event venue noise is considered potentially significant and unavoidable.

Exposure to Noise from Construction

On- and off-site construction activities occurring between the hours of 8:00 PM and 7:00 AM would result in a significant noise impact. Although daytime construction activities would not result in significant noise impacts as defined by the noise thresholds, because of the longer durations and higher noise levels that potentially could be involved in the construction of facilities within the Campus and the University Community, it is recommended that standard noise reduction techniques be used to further reduce the noise exposure of nearby noise-sensitive receptors to construction noise. Implementation of **Mitigation Measure NOI-3** would reduce the noise impact from nighttime construction and further minimize the less than significant impact from daytime construction.

Exposure to Groundborne Vibration

Vibration levels generated by construction activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used. Typical project construction activities would not generate substantial levels of vibration. Pile driving is not anticipated for the Bellevue Ranch Alternative due to the geology that is typical for Merced County. However, in the event that pile driving is required during construction, it could produce groundborne vibration levels that might be perceptible to nearby sensitive receptors. Implementation of **Mitigation Measures NOI-4a** and **NOI-4b** would reduce this impact to a less than significant level.

Exceed Noise Standards

The existing ambient noise environment at the project site is generally below the applicable noise compatibility standard of 60 L_{dn} for residences. However, with construction of the Bellevue Ranch Alternative, noise-sensitive uses could be developed adjacent to existing noise-generating uses, including traffic along Bellevue Road and agricultural operations, and the private airstrip located near Community South. In addition, noise-sensitive uses could be developed adjacent to new noise-generating components of the Bellevue Ranch Alternative, including project roadways, the multi-purpose stadium and arena area, and other campus facilities that could include noise-generating mechanical equipment such as cooling towers. Implementation of **Mitigation Measures NOI-5a** and **NOI-5b** would reduce impacts related to on-site and adjacent roadways and agricultural operations to a less than significant level.

4.10.6.4 Alternative 4 – 2002 Proposed Project

The 2002 Proposed Project Alternative consists of a 910-acre UC Merced Campus and an adjacent 2,133-acre University Community located in eastern Merced County. This alternative site is generally east and south of Lake Yosemite and bounded by Lake Road on the west and Yosemite Avenue on the south.

Increase in Ambient Traffic Noise Levels

Table 4.10-7 summarizes the calculated L_{dn} noise levels at a distance of 100 feet from roadway links on the surrounding road network under 2002 Proposed Project traffic conditions. Calculations assume an ambient background noise level of about 50 dBA L_{dn} based on noise measurements conducted in areas located away from any major traffic or other noise sources. As the table shows, off-site noise impacts from traffic associated with the 2002 Proposed Project would be identical to the impacts from traffic associated with the Proposed Action. Although **Mitigation Measure NOI-1** would reduce noise levels at existing sensitive receptors that would be affected, it is unlikely that in all cases mitigation would be available to reduce these impacts to a less than significant level. Therefore, the impact from project-related traffic noise is considered significant and unavoidable.

Exposure to Noise from Daily Operations and Special Events

Existing off-site sensitive receptors would not be affected by noise generated by on-site noise sources, including HVAC equipment installed on large buildings or a multi-purpose stadium on the campus. However, sensitive land uses within the Campus and University Community could potentially be close to these noise sources and could be affected by noise generated at these facilities. This would be a potentially significant impact.

Mitigation Measure NOI-2a would reduce the impact of typical operational noise sources to a less than significant level. For indoor facilities, **Mitigation Measure NOI-2b** would reduce this impact to a less than significant level. However, if the multi-purpose stadium or other similar facilities are proposed to be open to the outdoor environment, it is not certain that mitigation would be feasible to reduce the noise impact to a less-than-significant level in all cases because aesthetic considerations and usability of the space may make the noise thresholds unachievable. As a result, the impact from special event venue noise is considered potentially significant and unavoidable.

Exposure to Noise from Construction

On- and off-site construction activities occurring between the hours of 8:00 PM and 7:00 AM would result in a significant noise impact. Although daytime construction activities would not result in significant noise impacts as defined by the noise thresholds, because of the longer durations and higher noise levels that potentially could be involved in the construction of facilities within the Campus and the University Community, it is recommended that standard noise reduction techniques be used to further reduce the noise exposure of nearby noise-sensitive receptors to construction noise. Implementation of **Mitigation Measure NOI-3** would reduce the noise impact from nighttime construction and further minimize the less-than-significant impact from daytime construction.

Exposure to Groundborne Vibration

Vibration levels generated by construction activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used. Typical project construction activities would not generate substantial levels of vibration. Pile driving is not anticipated for the 2002 Proposed Project due to the geology that is typical for Merced County. However, in the event that pile driving is required during construction, it could produce groundborne vibration levels that might be perceptible to nearby sensitive receptors. Implementation of **Mitigation Measures NOI-4a** and **NOI-4b** would reduce this impact to a less-than-significant level.

Exceed Noise Standards

The existing ambient noise environment at the project site is generally below the applicable noise compatibility standard of 60 L_{dn} for residences. However, with construction of the 2002 Proposed Project, noise-sensitive uses could be developed adjacent to existing noise-generating uses, including traffic along Lake Road and Yosemite Avenue, recreational activities at Lake Yosemite Regional Park, agricultural operations, and the private airstrip located near Community South. In addition, noise-sensitive uses could be developed adjacent to new noise-generating components of the 2002 Proposed Project, including project roadways, the multi-purpose stadium and arena area, and other campus facilities that could include noise-generating mechanical equipment such as cooling towers. Implementation of **Mitigation Measures NOI-5a** and **NOI-5b** would reduce impacts related to on-site and adjacent roadways, parks, and airstrip and agricultural operations to a less-than-significant level.

4.10.6.5 Alternative 5 – No Action

The No Action Alternative would result if the United States Army Corps of Engineers (USACE) were to deny the Section 404 permit that has been requested by the University and UCLC to fill waters of the United States including wetlands to build the Campus and Community North. Under this alternative, the Phase 1.1 Campus development would remain on the site. However, because no further development of the Campus would occur on site, UC Merced would not be established as a new campus beyond the 104-acre existing Phase 1.1 Campus. Under this alternative, Community South could still proceed with development that would be unrelated to the campus based on development plans proposed by the owners of that property.

Increase in Ambient Traffic Noise Levels

Table 4.10-7 summarizes the calculated L_{dn} noise levels at a distance of 100 feet from roadway links on the surrounding road network under 2030 No Action Alternative traffic conditions. Calculations assume

an ambient background noise level of about 50 dBA L_{dn} based on noise measurements conducted in areas located away from any major traffic or other noise sources. Alternative 5 traffic would not cause the noise significance thresholds to be exceeded along Cardella Road. Similar to the Proposed Action, the noise significance thresholds would be exceeded along Kibby Road south of Yosemite Avenue. Although **Mitigation Measure NOI-1** would reduce noise levels at existing sensitive receptors that would be affected, it is unlikely that in all cases mitigation would be available to reduce these impacts to a less-than-significant level. Therefore, the impact from project-related traffic noise is considered significant and unavoidable.

Exposure to Noise from Daily Operations and Special Events

Under the No Action Alternative, no further development of the Campus would occur. Existing off-site sensitive receptors would not be affected by noise generated by on-site noise sources. This impact is considered less than significant.

Exposure to Noise from Construction

On- and off-site construction activities occurring between the hours of 8:00 PM and 7:00 AM would result in a significant noise impact. Although daytime construction activities would not result in significant noise impacts as defined by the noise thresholds, because of the longer durations and higher noise levels that potentially could be involved in the construction of facilities within Community South, it is recommended that standard noise reduction techniques be used to further reduce the noise exposure of nearby noise-sensitive receptors to construction noise. Implementation of **Mitigation Measure NOI-3** would reduce the noise impact from nighttime construction and further minimize the less-than-significant impact from daytime construction.

Exposure to Groundborne Vibration

Vibration levels generated by construction activities would vary depending on project conditions such as soil conditions, construction methods, and equipment used. Typical project construction activities would not generate substantial levels of vibration. Pile driving is not anticipated for the No Action Alternative due to the geology that is typical for Merced County. This impact is considered less than significant.

Exceed Noise Standards

The existing ambient noise environment at the project site is generally below the applicable noise compatibility standard of 60 L_{dn} for residences. However, with construction of the No Action Alternative, noise-sensitive uses could be developed adjacent to existing noise-generating uses, including agricultural

operations, and the private airstrip located near Community South. Implementation of **Mitigation Measure NOI-5b** would reduce impacts related to airstrip and agricultural operations to a less than significant level.

4.10.6.6 Alternative 6 – No Build

The No Build Alternative assumes no construction at all would occur on the project site, regardless of whether the USACE issues a permit for the fill of waters of the United States. Under this alternative, the project site would not be developed with the campus or its associated community. The Phase 1.1 Campus development would remain on the site; however because no further development of the Campus would occur, UC Merced would not be established as a new campus beyond the 104-acre existing Phase 1.1 Campus.

Increase in Ambient Traffic Noise Levels

Under this alternative, no new noise impacts related to traffic would occur.

Exposure to Noise from Daily Operations and Special Events

Under this alternative, no new noise impacts related to daily operations or special events would occur.

Exposure to Noise from Construction

Under this alternative, no new noise impacts related to construction would occur.

Exposure to Groundborne Vibration

Under this alternative, no new noise impacts related to groundborne vibration would occur.

Exceed Noise Standards

Under this alternative, no new noise impacts would occur.

4.10.7 COMPARISON OF ALTERNATIVES

Under the Proposed Action, significant impacts are anticipated as a result of project-generated traffic noise at existing off-site noise-sensitive receptors along Cardella Road east of G Street and Kibby Road south of Yosemite Avenue. Significant construction noise impacts at on- and off-site receptors were identified, along with operational noise impacts due to project development of noise-generating uses such as the multi-purpose stadium and mechanical equipment. For proposed noise-sensitive uses on the

campus and the University Community, noise levels could potentially exceed noise thresholds in areas adjacent to Campus Parkway, the airstrip located east of Community South, and noise-generating Campus uses. Mitigation measures are provided to reduce most of these impacts to a less than significant level; however, certain noise impacts, including the impact of project traffic noise increases on off-site receptors and the impact of multi-purpose stadium activity noise on Campus and off-site receptors, would remain significant and unavoidable.

Under the Yosemite Avenue Alternative and the 2002 Project Alternative, traffic, operational, and construction impacts would be similar to the Proposed Action. For the Bellevue Ranch Alternative, traffic impacts are not predicted along Kibby Road or Cardella Road. However, significant impacts are predicted along an additional segment, Bellevue Road west of SR 59, where some existing residences are located. In addition, operational and construction impacts would be greater for the Bellevue Ranch Alternative because the site is located closer to a larger number of existing residences. For the No Action Alternative, traffic noise impacts are predicted only along Kibby Road and construction impacts and exposure to agricultural operations noise would apply only to Community South. Similar to the Proposed Action Alternative, mitigation would reduce most of the impacts under each alternative to a less than significant level; however, the significant and unavoidable noise impacts identified under the Proposed Alternative would remain significant and unavoidable.

4.10.8 REFERENCES

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Table 4.10-7
Predicted Traffic Noise Levels and Increases at a Distance of 100 feet from the Center of the Roadway

Road	Location	Modeled L_{dn} Noise Level, dBA[2]							Increase over 2008 Existing, dBA[1]						Increase over 2030 No Build[1]				
		2008 Existing	2030 No Build	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite	2030 No Build	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite
Lake Road	South of Bellevue	55	55	55	55	55	55	55	0	0	0	0	0	0	0	0	0	0	0
Lake Road		55	55	55	55	55	55	55	0	0	0	0	0	0	0	0	0	0	0
Campus Parkway	South of Bellevue	<50[4]	59	61	63	63	63	63	9	11	13	13	13	13	2	4	4	4	4
Campus Parkway	South of Cardella	<50[4]	63	64	64	64	64	64	13	14	14	14	14	14	1	1	1	1	1
Lake Road + Campus Parkway[3]	South of Bellevue	55	56	57	58	58	58	58	1	2	3	3	3	3	1	2	2	2	2
Lake Road + Campus Parkway[3]	South of Cardella	55	58	59	59	59	59	59	3	4	4	4	4	4	1	1	1	1	1
McKee	So. of Yosemite Ave	54	57	57	58	58	57	58	3	3	3	3	3	3	0	1	1	0	1
McKee	South of Olive	57	59	59	60	59	60	59	3	3	3	3	3	3	0	0	0	0	0
Yosemite Ave	East of SR 59	58	59	59	59	59	59	59	0	1	0	0	1	0	0	0	0	0	0
Yosemite Ave	East of G St	58	59	60	60	60	60	60	1	2	2	2	2	2	1	1	1	0	1
Yosemite Ave	West of Lake	55	57	59	60	59	58	60	2	4	4	4	3	4	2	3	2	1	3
Yosemite Ave	East of Lake	55	60	62	62	62	62	63	5	7	7	7	7	8	2	2	2	1	2
YosemiteAve	East of Kibby	55	60	60	61	61	61	61	5	5	6	6	6	6	0	1	1	1	1
Yosemite Pkwy	West of Santa Fe Ave	57	56	57	58	57	56	58	-1	1	1	1	0	1	1	2	2	1	2
Yosemite Pkwy	East of Santa Fe Ave	60	61	62	63	63	62	63	1	2	3	3	2	3	1	2	2	1	2
Olive Ave	East of SR 59	61	62	62	62	62	62	62	1	1	1	1	1	1	0	0	0	0	0
Olive Ave	West of G St	60	61	61	61	61	62	61	1	1	1	1	2	1	0	0	0	1	0
Olive Ave	East of G St	60	61	61	61	61	61	61	1	1	1	1	1	1	0	0	0	0	0
G St	South of Bellevue	57	61	61	62	61	62	61	4	4	5	4	5	4	0	0	0	1	0
G St	South of Cardella	57	60	61	61	61	61	61	3	3	4	4	4	4	0	1	1	1	0
G St	So. of Yosemite Ave	59	61	61	61	61	61	61	2	2	2	2	2	2	0	0	0	0	0
G St	South of Olive	61	62	62	62	62	62	62	1	1	1	1	1	1	0	0	0	0	0
M St	North of 23rd	58	58	59	59	59	59	59	0	0	0	0	1	0	0	0	0	1	0
M St	South of 23rd	58	58	58	58	58	59	58	0	0	0	0	0	0	0	0	0	1	0
SR 59	South of Belleview	59	61	61	61	61	62	61	1	1	1	1	3	1	0	0	0	1	0

Road	Location	Modeled L_{dn} Noise Level, dBA[2]							Increase over 2008 Existing, dBA[1]						Increase over 2030 No Build[1]				
		2008 Existing	2030 No Build	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite	2030 No Build	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite	2030 No Action	2030 Proposed Action	2002 Project	2030 Bellevue	2030 Yosemite
SR 59	South of Cardella	61	62	62	63	62	63	63	2	2	2	2	3	2	0	0	0	1	0
SR 59	So. of Yosemite Ave	62	64	64	64	64	65	64	2	2	2	2	2	2	0	0	0	0	0
SR 59	South of Olive	59	61	61	61	61	62	61	3	3	3	3	3	3	0	0	0	0	0
Cardella Road	East of SR 59	51	52	52	53	53	54	53	1	1	2	2	3	2	0	1	1	2	1
Cardella Road	East of G St	51	57	60	62	62	60	62	6	9	11	11	9	11	3	5	5	3	5
16th St	West of SR 59	60	62	61	61	61	62	61	1	1	1	1	2	1	0	0	0	0	0
Kibby	So. of Yosemite Ave	53	53	58	58	58	55	59	1	5	5	5	3	6	5	5	5	2	5
Kibby	North of Yosemite	54	56	59	60	60	58	60	3	5	6	6	5	6	3	3	3	2	4
Parsons	North of Olive	54	56	56	56	56	56	56	2	2	3	2	2	3	0	1	0	0	0
Parsons	South of Olive	53	56	56	56	56	56	56	3	3	3	3	3	3	0	0	0	0	0
Bellevue	West of Lake	54	58	59	60	60	60	60	3	5	6	6	6	6	1	3	3	2	3
SR 140	West of Massasso	61	62	62	62	62	63	63	1	1	1	1	2	1	0	0	0	1	0
Bellevue	East of SR 59	53	58	59	59	59	61	59	6	6	6	6	8	6	0	1	0	2	1
Bellevue	West of SR 59	58	62	62	62	62	67	62	4	4	4	4	9	4	0	0	0	5	0
SR 99	North of 16th St	72	73	73	73	73	74	73	1	1	1	1	1	1	0	0	0	0	0
SR 99	North of M St	72	73	73	73	73	73	73	1	1	1	1	1	1	0	0	0	0	0
SR 99	So. of Yosemite Pkwy	71	72	72	72	72	72	72	1	1	1	1	1	1	0	0	0	0	0
SR 99	South of Mission Ave	71	72	72	72	72	72	72	2	2	2	1	2	2	0	0	0	0	0
Campus Pkwy	So. of Yosemite Ave	<50[4]	68	68	68	68	68	68	18	18	18	18	18	18	0	0	0	0	0
Campus Pkwy	South of Olive Ave	<50[4]	68	68	68	68	68	68	18	18	18	18	18	18	0	0	0	0	0

[1] *Discrepancies may occur due to rounding.*
[2] *Calculations assume an ambient background noise level of about 50 dBA L_{dn}.*
Increases that result in significant noise impacts are highlighted
[3] *Noise level is calculated from the cumulative traffic noise resulting from Lake Road at a distance of 100 feet from the center of the roadway and Campus Parkway at a distance of 325 feet from the center of the roadway.*
[4] *Roadway segment does not exist under the given scenario.*
Increases that result in significant noise impacts are highlighted

4.11 PUBLIC SERVICES AND RECREATION

4.11.1 INTRODUCTION

This section describes the existing public services that serve the project site and its vicinity and potential impacts to these services from the development of the UC Merced Campus and University Community. The public services addressed in this section include fire protection, law enforcement, schools, libraries, and parks. Regulations and policies affecting the public services and recreational resources in the project area are also described. Information presented in this section is based on consultation with service providers.

No public or agency comments related to public services or recreation were received in response to the Notice of Preparation and the Notice of Intent issued for this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

4.11.2 AFFECTED ENVIRONMENT

Under the Proposed Action, both the Campus and University Community are located within incorporated Merced County at this time. Therefore, under existing conditions, with the exception of law enforcement services for the campus portion of the site, which are provided by the Campus Police Department, all services to the project site are provided by the County. As discussed in **Section 2.0, Project Description**, the Campus and University Community may be annexed to the City or remain in unincorporated Merced County. If the Campus and University Community are annexed to the City of Merced, the City would provide fire protection (as well as sewer and water services discussed in **Section 4.14**) in the case of both the Campus and the University Community, and also law enforcement in the case of the University Community. If annexation does not take place or annexation is delayed, the University plans to enter into an agreement with the City for the provision fire service to the Campus. Although not certain at this time, there is a possibility that the UC Merced Police Department would serve the Community North portion of the University Community.

All other build alternatives are similarly located in unincorporated Merced County and would have to be annexed to the City of Merced to receive City services. The one exception is the Bellevue Ranch alternative, most of which is already annexed or within the City's existing sphere of influence (SOI); therefore, it is already served by City services, including fire and law enforcement (note that a small area in the northerly portion of the Bellevue Ranch alternative site is outside the current City limits and SOI and would need to be annexed). Given the possibility that the sites of the Proposed Action and its alternatives may be annexed to the City in the future, both the County service departments and the City

service departments that would serve the project site if the sites were indeed annexed or would provide out-of-area services by the City, are described below.

4.11.2.1 Alternative 1 – Proposed Action

Law Enforcement Services

The population associated with the proposed UC Merced Campus and University Community would generate demand for law enforcement services. The following entities would provide law enforcement services to the Campus and the University Community.

UC Merced Police Department

As mentioned in **Section 2.0, Project Description**, the UC Merced Police Department has established a police station with associated staff on the Phase 1.1 Campus that serves the Campus and associated University properties. This is consistent with University of California practice of providing its own police force to serve each campus. The UC Merced Police Department is responsible for providing 24-hour service for on-campus calls. The UC Merced Police Department has a mutual aid agreement with the Merced County Sheriff's Department and the City of Merced Police Department.

Currently, the Campus police department consists of 10 sworn officers and nine non-sworn employees. The UC Merced Police Department maintains service level standard of 0.7 officer per 1,000 persons of the campus population (Matthew 2008). It is anticipated that when the campus enrollment level is 25,000 full-time equivalent students, a total of 59 sworn officers and 52 non-sworn employees would serve the Campus. Although not certain at this time, there is a possibility that the UC Merced Police Department would serve the Community North portion of the University Community, in which case the size of the department could be larger than indicated above.

Merced County Sheriff's Department

The Merced County Sheriff's Department currently provides law enforcement services to the University Community site. Services include patrolling, crime prevention, maintaining the County jail, SWAT team, and providing identification and fingerprinting. The sheriff's department has a main station in the City of Merced, approximately 6 miles from the project site, at 700 West 22nd Street in downtown Merced. There are 120 sworn officers in the sheriff's department, which includes approximately 32 patrol officers, four patrol sergeants, 10 detectives, one detective sergeant. Response time averages at approximately 12 minutes for non-priority calls and 5 to 7 minutes or less for emergency calls—well within national average standards (Saavedra 2008).

City of Merced Police Department

The Merced Police Department (Merced PD) provides law enforcement services within the City limits and serves areas beyond City limits through mutual aid agreements with the Merced County Sheriff's Department and the California Highway Patrol. If annexed, the University Community site would be under the jurisdiction of the Merced PD; although, as noted above, Community North could potentially be served by the Campus Police Department. The Merced PD currently has 111 sworn officers and maintains a service standard of 1.32 sworn officers per 1,000 residents. By 2030, the police department would need an additional 40 officers to serve the population associated with the University Community. Based on the City of Merced General Plan Update (currently under preparation), Merced PD is expected to employ approximately 280 to 300 officers by 2030 and would continue to expand stations as needed to meet service standards (Thomas 2008). Currently, the station closest to the project site is at 1109 Loughborough Drive, less than 5 miles southwest of the site. The Merced PD plans to construct a new station within the City of Merced in the next five years. This police station could be collocated with a fire station in the northern portion of the City of Merced (Espinosa 2008). Additionally, a new station is planned as part of the University Community.

The Merced PD has 50 patrol vehicles, canines, a mounted posse group, a SWAT team, a regional bomb team, a bike patrol, a high-tech unit, and a detective unit. The target response time standard is 2 to 3 minutes for high priority calls, and 15 to 20 minutes for non-emergency calls (Thomas 2008). The Merced PD currently has a mutual aid agreement with the Merced County Sheriff's Department and the California Highway Patrol to serve the region.

Fire Protection and Emergency Medical Services

Under existing conditions, the project site is located within the service area of the Merced County Fire Department (Mitten 2008). For the next phase of Campus development, the Campus will likely obtain fire protection services from the City under a services agreement. Upon annexation, the City of Merced Fire Department (Fire Department) would provide fire protection and emergency medical services to the proposed UC Merced Campus and University Community. Availability of water for fire supply is discussed in **Section 4.14, Utilities and Service Systems**.

Merced County Fire Department

The project site and its vicinity are currently served by the Merced County Fire Department. The nearest County fire department station is located on McKee Road near the El Portal Road intersection. The Merced County Fire Department is administered and personnel are provided through a contract with the California Department of Forestry and Fire Protection (CDF). Support personnel are Merced County

employees. The wildland area to the east of the project site is located in a State Responsibility Area (SRA), under the jurisdiction of the CDF (Mitten 2008). Service to this area is part of the mutual aid agreement between the CDF and the County fire department.

City of Merced Fire Department

The City of Merced provides full fire protection services, including fire suppression, emergency medical services, fire prevention inspections, and disaster planning within the City limits. Five stations are located within the City of Merced. The fire department is staffed with 54 personnel and is equipped with seven engines, two trucks, and a rescue squad (City of Merced Web site 2008a). The station closest to the project site is Station 55, located at the intersection of Parsons Avenue and Silverado Street, which is near Yosemite Avenue. Station 55 is approximately 3 miles southwest of the project site.

The City of Merced has a Fire Protection Master Plan to accommodate growth in the Merced area, which includes the construction of nine new stations. A station is planned to be located within 1 mile of the proposed campus, near Bellevue Road and G Street. This station (Station 57 or 58) would be constructed when its services are determined to be needed based on the development levels in the City of Merced (Mitten 2008).

Insurance companies use the Insurance Service Order (ISO) rating to determine fire insurance rates. The ISO considers the number of firefighting personnel and equipment available to an area, and the average emergency response time. The rating ranges from 1 to 10, with 1 representing excellent fire protection and 10 indicating minimal to no service. The City of Merced Fire Department has an ISO rating of 2. The response time standard for the Department is 4 to 6 minutes Citywide. The fire department currently maintains an average response time of approximately 5 minutes.

Under a mutual aid agreement, the City of Merced Fire Department and the County of Merced Fire Department respond to each other's requests for assistance. Frequently, the County fire department is called away by the CDF, and the City fire department provides service to the unincorporated areas of the County.

Schools

The project site and the sites of all the build alternatives are located within the boundaries of the Merced City School District (MCSD), the Weaver Union School District (WUSD), and the Merced Union High School District (MUHSD). The MCSD and WUSD provide education for kindergarten through eighth grade. The MUHSD serves students in grades 9 through 12.

There are 13 elementary schools and 4 middle schools in the MCSD. Peterson Elementary School is located closest to the project site at 848 East Donna Drive, approximately 4 miles from the proposed site. This K–5 school was established in 1984 and is the largest elementary school in the district (Testa 2008a). Current enrollment is 743 students; its capacity is 750 students. Chenoweth Elementary School—also located to the southwest of the campus—currently has enrollment of 675 students, with a capacity of 704. The nearest junior high school is Cruickshank Middle School, located at 601 Cormorant Drive, near G Street and Yosemite Avenue. Cruickshank is located approximately 3 miles from the proposed campus. Enrollment at Cruickshank is 930, with a capacity of 1,088 students. The student generation rates for MCSD are 0.526 student per dwelling unit for single-family residences and 0.215 student per multifamily apartment (Testa 2008b).

There are two elementary schools and one middle school in the WUSD. Pioneer Elementary School is located at 2950 Gerard Avenue, approximately 4 miles south of the project site. Weaver Middle School is also located approximately 4 miles south of the project site at 3076 East Childs Avenue. Enrollment in the Weaver Union School District for the 2007–2008 school year was 2,341 students, and the WUSD has a capacity for 2,470 students. The student generation rate for WUSD is 0.581 student per single-family residence (WUSD 2008).

The MUHSD operates seven high schools, four of which are located within Merced City limits: Merced High School, Golden Valley High School, Yosemite High School, and Independence High School; the latter two are alternative high schools. The other three high schools in the district are Atwater High School, Buhach Colony High School, and Livingston High School. The MUHSD also operates the East Campus Educational Center, an adult school.

The project site is located within the attendance area of Golden Valley High School. Golden Valley High School is the closest high school to the proposed campus, at 2121 East Childs Avenue (and North Parsons Avenue), approximately 4 miles away. Merced High School is also close to the site, located at 205 West Olive Street. Enrollment at Golden Valley High School was approximately 2,522 students in 2007, and the capacity of the school in permanent classrooms is 2,052 students. Merced High School has a capacity of 2,025 students; enrollment for 2007 reached 2,563 students. These enrollment levels are in excess of each school's capacity. As discussed in the MUHSD Five-Year Facility Plan, overcrowding at Merced High School and Golden Valley High School is a result of population growth in the attendance boundaries and the development of the UC Merced Campus (MUHSD 2008). A new "North Merced High School" is planned for construction on Farmland Road and G Street, with a capacity of 2,000 students. This high school site is in the process of receiving final approval by the MUHSD (MUHSD 2008). The school would be approximately 3 miles from the proposed project. The student generation rates for MUHSD are 0.23 student per single-family residence and 0.1 student per multifamily apartment.

Public Libraries

The Merced County Library system was established in 1910. Its main branch is in Merced and regional branches are located in Atwater, Dos Palos, Gustine, Livingston, and Los Banos. These libraries lend books, records, cassettes, and magazines to County residents. Computers are also available to residents for internet and word processing services. The main branch is 44,050 square feet, and is open six days a week for an average of 7.5 hours per day. Regional branches are open five days a week for an average of 5.7 hours each day.

Library services in the County of Merced have been scaled back since 1993 due to lack of funding. In 1997, the City and County of Merced adopted a property tax sharing agreement in which the County would receive a share of the tax increment from Redevelopment Project Area #2 specifically for library purposes (Merced County 2004). The County library system still lacks the necessary funding to provide adequate circulation and staffing for existing libraries (Meriam 2008). There are currently 55 full-time and part-time employees in the County library system, including 11 staff members at the main branch in Merced. The Merced County General Plan does not contain any policies or implementing actions related to libraries.

The proposed Campus would provide extensive library resources. These resources would be primarily for the research and educational needs of faculty and students; however, there would be some public access. The Campus Library has already been constructed on the Phase 1.1 Campus.

Parks and Recreational Facilities

County of Merced Parks and Recreational Facilities

County-owned recreational facilities are managed by the Merced County Parks and Recreation Office. County recreational facilities near the project site are described below.

Lake Yosemite Regional Park

Lake Yosemite Regional Park is an important regional recreation facility serving thousands of area residents annually. The Merced Irrigation District owns the 486-acre lake and the surrounding shoreline, which has been a regional recreational site since the late 1930s. The County operates the lake and the shoreline for recreational uses under a 50-year lease (1976 to 2026). The County-owned regional park is approximately 233 acres total, and the developed portion of the County property is approximately 89 acres. Some land acreage within the park site currently is undeveloped and is not used for recreational purposes. No park expansions are planned at this time (Vejar 2008). In 1969 and 1974, the County

purchased approximately 260 acres of land adjacent to Lake Yosemite Regional Park to expand the park. At this time, there is no master plan for the expansion of the park into this area.

Lake Yosemite Regional Park is extensively used. The peak period begins on Easter Sunday and continues until mid-October. There are approximately 300,000 visits to the park annually (Vejar 2008).

Lake Yosemite provides a variety of passive and active recreational facilities, including swimming, powerboat and sailboat facilities, and a boat ramp. Water skis and jet skis are allowed, and there are no maximum engine size or noise restrictions on boat motors or jet skis. Park facilities include the following:

- Picnic tables and barbeque pits
- Paved trails for bicycling and walking
- Two beach areas for swimming
- Two boat launching ramps
- Sixty sailboat slips
- Mooring slips for powerboat use
- Two recreational baseball fields
- Rainbow trout fishing
- Three playgrounds for children
- Volleyball courts
- Rental facilities (picnic sites and a building for indoor activities)
- Support facilities (first aid, food concession, restrooms, water wells, and parking)

Bike Paths in the Project Area

A Class I bike path is located along the eastern side of Lake Road between Yosemite Avenue and Lake Yosemite. The Merced and Atwater Bicycle Plan shows this existing bike path would connect to a bike path proposed on Lake Road, south of Yosemite Avenue, and continuing along Black Rascal Creek to the west. Another proposed extension of this bike path would be located east of Lake Road along the alignment of the Campus Parkway. There is also a new bike path along Bellevue between Lake Road and G Street.

City of Merced Parks and Recreational Facilities

The City of Merced Parks and Community Services Department maintains park and recreational facilities. Both active and passive recreational areas, which include a variety of park types, are available to residents, as well as an extensive off-street bicycle path system. The City currently maintains 187 acres of active parkland and 120 acres of linear parkland encompassing the stream corridors where the bike paths are located. Nearby community and neighborhood parks include Fahrens Park, Santa Fe Park, Rahilly Park, and Burbank Park (City of Merced Web site 2008b).

4.11.2.2 Alternative 2 – Yosemite Avenue

Under Alternative 2, the Campus and Community North would be located on UCLC and LWH Farms LLC lands, and Community South would be located south of Yosemite Avenue. Eventually, the UC Merced Campus, Community North, and Community South either would be annexed into the City of Merced, or would remain in unincorporated County. The same service providers in the City and County would serve this site as are described above for Alternative 1, Proposed Action.

4.11.2.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch Alternative location is approximately 2 miles west of the Phase 1 Campus area. The site of this alternative is within the City limits and SOI of the City of Merced, with the exception of a small area outside the SOI. All City of Merced public services and service providers described above for the Proposed Action would serve this site because almost the entire site is within the City limits and SOI. County service providers would not serve this alternative site.

4.11.2.4 Alternative 4 – 2002 Proposed Project

The site of Alternative 4, identified as the 2002 Proposed Project, is similar to that under Alternative 1, Proposed Action, except that the Campus and the University Community areas are larger than under the Proposed Action. The site is mostly undeveloped with the exception of the Phase 1 Campus area and scattered farm-related structures on the LWH Farms LLC property. All public services described above for the Proposed Action would apply to this alternative.

4.11.2.5 Alternative 5 – No Action

The site of Alternative 5 is the same as the site under Alternative 1, Proposed Action. All public services described above for the Proposed Action would apply to this alternative.

4.11.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.11.3.1 State Regulations

Senate Bill 50

The Leroy F. Greene School Facilities Act of 1998, or Senate Bill 50 (SB 50), restricts the ability of a local agency to deny project approvals on the basis that public school facilities (classrooms, auditoriums, etc.) are inadequate. School impact fees are collected at the time building permits are issued. These fees are used by the local schools to accommodate the new students added by the project, thereby reducing potential impacts on schools to a less-than-significant impact. Payment of school fees is required by SB 50 for all new residential development projects and is considered full and complete mitigation of school impacts.

Quimby Act

California Government Code Section 66477, Subdivision Map Act, referred to as the Quimby Act, permits local jurisdictions to require the dedication of land and/or the payment of in-lieu fees solely for park and recreation purposes. The required dedication and/or fee are based on the residential density, parkland cost, and other factors. Land dedicated and fees collected pursuant to the Quimby Act may only be used for developing new, or rehabilitating existing, park or recreational facilities. The maximum dedication and/or fee allowed under current state law is equivalent to providing 3 acres of park land per 1,000 persons, unless the park acreage of a municipality exceeds that standard, in which case the maximum dedication is 5 acres per 1,000 residents (County of Merced 2004).

4.11.3.2 Local Plans and Policies

Merced County General Plan

Goals, policies and implementing actions in the Merced County General Plan related to wildland fire protection services are provided in **Table 4.11-1, Merced County General Plan Goals, Policies, and Implementing Actions,** below.

The County general plan notes that recreational areas are both a vital component of healthy communities and a regional resource. The County has approximately 65,000 acres of regional County parks, and state and federal park and recreational areas. Within designated urban areas, the general plan encourages dual use of both school grounds and drainage basins as park sites in order to maximize the use of valuable land and reduce the amount of designated residential land taken by these required features. The general

plan also recommends coordination of pedestrian, bicycle and equestrian trails with other recreation resources in both urban and rural area environments to enhance both access and recreational enjoyment.

The Merced County General Plan goals, policies, and implementing actions related to public services and parks and recreation are provided in **Table 4.11-1** below.

Table 4.11-1
Merced County General Goals, Policies, and Implementing Actions

Police and Fire	
Goal 5	The risk of injury and property damage resulting from wildland and urban fires is minimized.
Objective 5. A.	An adequate level of fire safety is provided in urban areas.
Policy 5.A.1	Minimum peak-load water supply standards for developments in urban areas with public water systems should be established.
Policy 5.A.2	In urban areas where a public water system does not exist, ensure adequate water supplies are available for fire suppression prior to occupancy of any structure.
Policy 5.A.3	Sprinkler systems shall be considered in areas where the Fire Department determines alternate fire protection measures are not adequate.
Implementation	All buildings and structures shall be reviewed during the building permit stage to ensure that they are constructed to fire safety standards prescribed in the Building Code and the County
Objective 5.B.	An adequate level of protection from wildland fires is provided in rural areas.
Policy 5.B.4	In the review of subdivisions and building permits in rural areas, provision shall be made for safe all-weather access for fire and other, emergency equipment.
Policy 5.B.5	In areas designated as having a very high fire hazard severity, the establishment of safe all-weather access for fire and emergency equipment shall be encouraged to serve existing residential uses.
Implementation	A determination shall be made at the building permit or subdivision review stage in "Agricultural" and "Foothill Pasture" designated areas that all-weather access to a public road exists, or can be provided, for emergency equipment. Generally, this involves a minimum 20-foot access right-of-way. The County will assist property owners of existing residences in very high fire hazard zones in identifying appropriate access routes and improvements necessary to meet all-weather requirements.
Policy 5.B.6	In areas designated as having a very high fire hazard severity, the establishment and maintenance of "clear zones" around new and existing residential structures shall be encouraged.
Implementation	The County Fire Department will assist property owners in identifying appropriate clear areas around residences and how they should be maintained.

Parks and Recreation	
Land Use, Goal 9	Accommodation of public land uses and private facilities, which satisfy specific, County needs.
Objective 9.A	Recreational areas, institutional and public facilities, hazardous and non-hazardous waste facilities, power and communication towers and airports are appropriately located to minimize land use conflicts while satisfying local or regional demands.
Policy 9.A.1	1. Ensure that adequate local and regional park facilities are available to serve the growing County population.
Policy 9.A.2	2. Public recreational areas may be designated "Recreational" on individual urban boundary diagrams; otherwise these areas may be identified by a combining designation through the symbol "R" over the base land use designation on the Land Use Policy Diagram.
Circulation, Goal 2	A circulation system which provides for a variety of transportation modes for the safe and efficient movement of people and goods throughout the County.
Objective 2.B	An established bikeway system meeting the existing and future needs.
Policy 2.B.7	Encourage the construction of Class I, II or III bike routes as designated in the overall Merced Bounty Bikeway Plan and in Community Specific Plans.
Policy 2.B.8	The location and construction of bikeways shall be coordinated with incorporated cities and adjacent counties.
Open Space /Conservation, Goal 3	Open space for recreation, aesthetics, and protection from hazards.
Objective 3.A	Recreational lands are available for local and regional needs.
Policy 3.A.1	Encourage the continuation and expansion of existing public recreation land uses, including but not limited to, public beaches, parks, recreation areas, wild areas and trails.
Policy 3.A.2	Ensure that adequate local and regional park facilities are available to serve the growing County population.
Policy 3.A.3	Establish and continue to develop a system of local and regional parks, and other recreation areas throughout the County which balance the relative importance of direct site access with management of sensitive wildlife resources.
Policy 3.A.4	Non-recreational land uses should be buffered from sensitive public recreation lands through site design and other techniques.
Policy 3.A.5	Promote the use of energy, communication, transmission and distribution easements as equestrian, bicycle and pedestrian or hiking trails.
Policy 3.A.6	Areas identified as proposed for the California Recreational Trails System should be reviewed during project proposals for consideration of easements and integration into County recreational facilities.
Objective 3.B	Lands with high aesthetic value are properly managed.
Policy 3.B.1	Stream corridors should be maintained in a natural condition and retain the general character of natural slopes and formations. Regional parks should be used to preserve areas of natural and scenic beauty.
Policy 3.B.2	Regional parks should be used to preserve areas of natural scenic beauty.
Objective 3.C	Open space lands are used for public recreation.

Parks and Recreation (continued)	
Policy 3.C.12	Open space recreational uses should be considered appropriate for areas identified as noise impacted.
Policy 3.C.13	Agriculture shall be considered a compatible land use in public and private recreation areas that must be protected and buffered.

Merced County Code

Fire Prevention Ordinance. Where minimum fire flow water pressure is not available to satisfy Fire Department standards, alternate fire protection measures shall be identified and incorporated into the development.

Local Recreational Park Land Space and/or Fee Obligation Ordinance. Under the initial Quimby Act provisions, Merced County Ordinance 1090 was passed in 1982 and requires dedication of parkland or payment of in-lieu fees from new residential development based upon a minimum standard of 2.5 acres of parkland per 1,000 residents. The Ordinance applies to residential subdivisions with more than five parcels. Under Section 5 of the Ordinance, residential subdivisions consisting of 50 or fewer lots are considered as qualified for the payment of fees in lieu of land dedication. Those subdivisions with 51 lots or more are considered qualified for the provision of land or payment of fees or a combination of both (County of Merced 2004). Park fees can vary by subdivision as they are based upon appraised land value, and assume 3.2 persons per single-family or duplex residence or 2.0 persons per multifamily dwelling unit. The County has no standard for provision of regional parkland.

Merced County Fire Department Master Plan

The California Department of Forestry's Master Plan for the Merced County Fire Department includes the following relevant Level of Service Goals and Objectives:

Urban Fire Protection Goal: Initiate fire suppression prior to flashover in structure fires.

Fire Protection Objectives

- Apply extinguishing agent to all fires within seven minutes of dispatch.
- Full first alarm assignment in operation within 10 minutes.
- Control 90 percent of all fires with first alarm assignment.

Emergency Medical Response Goal: Provide First Responder Medical services within 5 minutes of dispatch.

Urban Fire Protection Goal: Confine structure fire to the building of origin with first alarm assignment.

Fire Protection Objectives

- Apply extinguishing agent to all fires within 10 minutes of dispatch.
- Full first alarm assignment in operation within 15 minutes.
- Control 90 percent of all fires with the first alarm assignment.

Emergency Medical Response Goal: Provide First Responder Medical services within 10 minutes of dispatch.

Rural Fire Protection Goal: confine structure fires to the building of origin with first alarm assignment.

Fire Protection Objectives:

- Apply extinguishing agent to all fires within 14 minutes of dispatch.
- Full first alarm assignment in operation within 20 minutes.
- Control 80 percent of all fires with first alarm assignment.

Emergency Medical Response Goal: Provide First Responder Medical services within 15 minutes of dispatch.

The Merced County Fire Department currently maintains fire stations with a proximity of every 1.5 miles in heavy urban areas, 3 miles in urban areas, and 5 miles in rural areas in order to maintain the above-mentioned levels of service (County of Merced 2004).

Merced and Atwater Bicycle Plan (Merced County Association of Governments)

The Merced and Atwater Bicycle Plan was created as an extension of those cities' general plans, the Regional Bicycle Plan and the Regional Transportation Plan. The plan incorporates specific City of Merced General Plan transportation policies and implementing actions, including encouraging use of bicycles as alternative transportation, providing bicycle support facilities, and maintaining and expanding the existing bicycle circulation system (County of Merced 2004).

UC Merced 2009 Long Range Development Plan

The updated UC Merced 2009 Long Range Development Plan (LRDP) contains policies that are intended to serve as a guide to future development of the UC Merced Campus. The following policies related to public services apply to the Proposed Action and its alternatives.

Communities/Land Use Policies

COM-6: Provide for indoor and outdoor facilities for intercollegiate competition, intramural use and general recreation by students, faculty and staff.

COM-13: Main streets within the east and west campus should be developed as mixed-use projects with student apartments above common facilities, student services, and recreation uses at ground level in order to generate activity along the streets.

Public Services

SER-7: Provide sufficient access for emergency vehicles to buildings on campus by allowing pathways of adequate configuration.

SER-9: Expand emergency preparedness plans as needed for campus safety and in coordination with appropriate local agencies.

University Community Plan

The University Community Plan (UCP) that was adopted in 2004 contains policies that are intended to guide development of public service facilities within the University Community. The following policies, as shown in **Table 4.11-2, UCP Policies**, related to public services apply to the University Community under the Proposed Action and alternatives.

Table 4.11-2
UCP Policies

Schools	
PE 1.1	Designate sufficient lands for school sites within the University Community planning area to meet local population demands.
PE 1.2	Require that developers consult with applicable school districts during the formulation of a sub-area Specific Plan to mutually confirm the number of public school age children to be generated by the proposed development, school site and facility needs, and a program and responsibilities for site acquisition, facility development, and funding. The program shall be incorporated into the sub-area Specific Plans and Development Agreements, which shall be reviewed and approved by the County.

Schools (continued)	
PE 1.3	Cooperate and coordinate with the Merced area school districts in the County's administrative and legislative actions to ensure that elementary, middle and high school sites and facilities adequately serve the needs and requirements of the University Community residents consistent with the standards and requirements of the school districts and within the authorities and limits prescribed by state legislation.
PE 1.4	Condition the approval of new development within the University Community upon the requirement that school impact fees shall be paid to the applicable school districts consistent with state law, or as may be voluntarily negotiated by project developers with the school districts.
PE 1.5	Encourage landowners and developers to enter into voluntary agreements with school districts where state mandated fees may be insufficient to meet the full costs of school and facility development, to supplement funding or provide other support for the acquisition and construction of school facilities needed for the planned development.
PE 1.6	Promote the use of creative financing methods to fund the construction of schools and associated community facilities where possible, such as access to federal grants, partnerships with corporate commercial developers and private foundations, and comparable techniques.
PE 1.7	Promote the development of a magnet high school within the University Community to serve the local residents and the greater region.
PE 1.8	Phase development within the University Community concurrently with the funding and/or availability of school facilities required to serve the development needs and requirements of the residents within the Community, or as otherwise agreed upon by the County and school districts in an approved sub-area Specific Plan and implementing Development Agreements.
Libraries and Cultural Facilities	
PLC 1.1	Establish standards for the development of Community libraries that recognize opportunities for joint use with UC Merced, other institutions, and opportunities imposed by digital communication.
PLC 1.2	Develop library facilities that serve the University Community, as identified in sub-area Specific Plans, which may include: • One or more freestanding facilities for library services • Shared library facilities with area schools • Library facilities integrated with multipurpose community/cultural facilities • Shared library facilities with UC Merced • Library facilities incorporated within commercial/retail development
PLC 1.3	Encourage libraries to be consolidated with other public facilities in the Town Center and Residential Village Centers near transit facilities, bike paths, and pedestrian paths, to serve as a contributing use that fosters activity and identity.
PLC 2.1	Encourage the development of library facilities that can be jointly used by public schools and community residents.
PLC 2.2	Work with UC library system to explore opportunities for the sharing/linkage of library resources including facilities, staffing, and circulation materials. Promote access to the UC library system by Merced's residents.

Police and Fire	
PS 1.1	Increase law enforcement personnel by approximately 40 personnel in order to accommodate the estimated 30,000 university community residents, based on the City of Merced Standard of 1.32 officers per 1,000 residents for urban services. This increase in personnel could differ if based on Merced County standards.
PS 1.2	Identify sites for police facility location(s) in subsequent Specific Plans for development in the University Community, based on need, phasing, and timing. The Town Center would be a priority candidate site.
PS 1.3	Coordinate development of public safety programs and personnel to serve the University Community with the UC Merced police programs, finding shared opportunities, where appropriate such as mutual response programs.
PS 1.4	Work with appropriate policing authorities to establish community and neighborhood safety and crime prevention programs (e.g., neighborhood watch).
PS 1.5	Work closely with UC Merced towards crime prevention specific to student/community conflicts.
PS 3.1	Ensure that fire facilities and personnel are expanded to serve the needs of the estimated 30,000 residents of the University Community and to maintain a five minute response time.
PS 3.2	Include appropriate fire facility location(s) in subsequent Specific Plans for development in the University Community, based on need, phasing, and timing.
PS 3.3	Provide an adequate level of water-related infrastructure in development for use in event of fire.
PS 3.4	Coordinate development of fire personnel and facilities with the UC fire protection programs, finding shared opportunities when possible.
PS 3.5	Implement brush clearing and other fire suppressing programs in adjacent lands, thereby reducing the possibility for the encroachment of wildland fires onto inhabited areas (in consideration of maintenance programs for important plant and animal habitats).
Health Care	
PHS 1.1	Work with local health providers to ensure that adequate health services are provided for University Community residents. This may involve the development of new facilities within the Community and/or expansion of existing facilities outside of the Community.
PHS 1.2	Locate any health care facilities that are developed in the Community in the Town Center and, secondarily, in the Residential Village Centers to maximize access by local residents and interface with other public uses.
PHS 1.3	Identify and commit the appropriate location(s) for health care facilities in subsequent sub-area Specific Plans, based on need, phasing, and timing.

Parks and Recreation	
PP 1.1	Provide sufficient parkland to meet the recreational needs of the University Community's residents, based on a standard of five acres per thousand residents, in accordance with Policy LU 9.4. Of this, a minimum of three acres per thousand residents shall be developed as community and/or neighborhood parks that contain sports fields and facilities, picnic areas, swimming pools, multipurpose gymnasiums/buildings, picnic areas, and similar improvements that meet the active recreational needs of the residents. The balance of acreage may be used for passive recreational activities such as hiking and nature observation.
PP 1.2	Require that a comprehensive parks and recreation component be defined in each sub-area Specific Plan that reflects concepts depicted on the Illustrative Open Space Concept (Land Use, Figure 9) and: • Defines service standards, park types, design guidelines, landscape standards, and appropriate programming for park facilities based on user demand assessments and community input • Identifies mini, neighborhood, and community park sites in accordance with service standards • Integrates neighborhood parks with neighborhood centers and schools • Links park facilities through an integrated trail network • Defines programming needs for park sites consistent with demographic trends in the University Community
PP 1.3	Require the dedication of neighborhood and community park sites in future phases of development, concurrent with the review and approval of Tentative Maps.
PP 1.4	Require that planned sites for park facilities be developed as part of an interconnected open space system (refer to LU 9.4).
PP 1.5	Require that neighborhood and community parks are sited, programmed, and developed in an environmentally sensitive fashion that is consistent with overarching principles of the University Community development. Park landscape should emphasize the use of native and drought-tolerant species. Treated wastewater and water captured and detained on site from rainfall should be used as primary sources of irrigation and on-site water amenity. Park structures should be constructed with recycled materials, to the extent practical.
PP 1.6	Provide park facilities programmed with active recreational facilities, including athletic facilities, such as multipurpose fields, ball fields, multipurpose courts, and other facilities oriented towards youth leagues and team sports in order that the existing highest recreational need in the Community is addressed.
PP 2.1	Require that large-scale commercial developments, such as the proposed Town Centers and Business Centers, integrate common recreational or open space facilities on site.
PP 2.2	Support the creation of community gardens as one of several elements of the University Community's open space system, provided that they are compatible with and do not adversely impact adjoining land uses.
PP 3.1	Create a continuous system of connected open space and recreation areas throughout the University Community. This will integrate active and passive parklands with preserved and restored natural habitats, detention basins, trails, and other open spaces. The precise location of this system shall be defined by each sub-area Specific Plan, in accordance with concepts on the Illustrative Land Use Diagram (refer to Land Use policies).
PP 4.1	Develop open space corridors alongside watercourses and valued natural resource areas, as an integral element of the continuous community park system (as defined in Policy PP 3.1).
PP 4.2	Provide open space buffers in areas where urban development abuts sensitive natural resource areas (wetlands, vernal pools, and grasslands) and agricultural lands.
PP 5.1	Require the siting of park facilities in proximity to school facilities. Sites shall be defined by the sub-area Specific Plans.

Parks and Recreation (continued)	
PP 5.2	Require use agreements between school jurisdiction and park jurisdictions, addressing time and nature of use for recreation facilities, liabilities, and other issues.
PP 5.3	Design storm drainage basins to accommodate both passive and active recreational uses during the dry periods (refer to Water-Related Infrastructure policies).
PP 5.4	Develop passive recreational facilities in natural resource conservation areas, e.g., nature interpretation, bird watching information, and similar amenities.
PP 5.5	Integrate community facilities, such as community centers, auditoriums, day care centers, seniors facilities, and other uses into park facilities.
PP 5.6	Encourage opportunities for the shared use of recreation facilities located on the UC Merced campus (Refer to Area Plan policy).
PP 6.1	Require that a comprehensive network of pedestrian paths be established linking each portion of the University Community, including the Town Center, UC Merced, Residential Village neighborhoods and centers, schools, and parks.
PP 6.2	Require each phase of new development in the University Community to connect with and expand upon existing trail facilities. Locations and improvements shall be defined in the sub-area Specific Plans.
PP 6.3	Encourage infrastructure rights-of-way or easements to be designed and developed to accommodate trails where feasible and where compatible with the intended primary use.
PP 6.4	Encourage the development of trail facilities in greenway or conservation corridor areas.
PP 6.5	Require that new trail facilities provide connections with existing and planned regional trail facilities and those planned by the UC on the university campus.
PP 7.1	Conduct a detailed recreation demand analysis in order to match park siting and program characteristics with the needs of Community residents.
PP 7.2	Create park facilities programmed with facilities for all age groups, including children and youth, teens, university students, and adults.
PP 7.3	Consider training and using local residents as volunteers to maintain and administer park programs (sports director, event organizers, property clean-up, and other) to enhance their ownership of the park, where appropriate.
UCP Area Plan – Lake Yosemite Regional Park	
ALY 1.1	Work with UC Merced for the shared use of its on-campus recreational, parking and sports facilities with the Merced community, especially with regards to campus parking in areas near Lake Yosemite Regional Park. Such cooperative programming may diminish impacts on the existing Park by providing additional recreational opportunities and shared parking for Park users.
ALY 1.2	Encourage UC Merced to provide students, staff, and faculty with active recreational and sports facilities and programs on campus that meet or exceed any recommended standards for the anticipated campus population, concurrent with increases in campus population.
ALY 1.3	Cooperate with UC Merced, to the maximum extent possible, to initiate and maintain a cooperative campus run, water-related program on Lake Yosemite that combines academic programs with student and public recreational water sports activities year round.
ALY 2.5	Monitor the use of Lake Yosemite Regional Park associated with increased population and assess those impacts related to the build out of the University Community and UC Merced. The County, UC Merced, and developers shall work cooperatively with the University to assure that development adjacent to Lake Yosemite does not result in a net increase in costs to the County or decrease in service level.

UCP Area Plan – Lake Yosemite Regional Park (continued)	
ALY 2.6	Initiate, in coordination with UC Merced, the development and implementation of a Lake Yosemite Regional Park Master Plan to determine the potential uses, necessary facilities, design standards, and funding strategies for public parkland surrounding Lake Yosemite. The Master Plan shall address active and passive recreation including playing fields, recreational equipment design and placement, a pedestrian, bicycle, and equestrian recreational trail system around the Lake and connecting to existing or planned trails, parking and landscape planning and design.
ALY 3.1	Work with UC Merced to create a joint task force to meet regularly in a public setting to achieve cooperative goals for recreation and open space planning, parkland and resource acquisition, and the provision of adequate active and passive recreation, parks, and open spaces to meet the needs of the population of eastern Merced County and UC Merced.
ALY 3.2	Work with the City of Merced to establish recreation fees to apply to all new development, including the University Community, to support the expansion of Lake Yosemite Regional Park.
ALY 3.3	Encourage development of a public golf course in the vicinity of the University Community, UC Merced, and Lake Yosemite, as warranted by demand for such a facility.

4.11.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

CEQ guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *California Environmental Quality Act (CEQA) Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment, which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). NEPA requires consideration of the unique characteristics of the geographic area, such as proximity to parkland, wetlands, wild and scenic rivers, or ecologically critical areas.

For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this Draft EIS/EIR, impacts related to public services (including recreation) would be significant if implementation of the Proposed Action or its alternatives would

- result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:
  - Fire protection
  - Police protection
  - Schools

  - Parklands or ecologically critical areas
  - Other public facilities such as libraries

- increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment.

4.11.5 METHODOLOGY FOR EVALUATING EFFECTS

As noted earlier, both the Campus and University Community are located within incorporated Merced County. A portion of the campus site, including the Phase 1.1 Campus, is within the City's SOI and, therefore, can receive urban services from the City on an interim basis under an extra-territorial services agreement. Phase 1.1 of the campus is currently provided sewer and water service by the City under such an agreement.

Two scenarios are under consideration for the provision of public services to the Campus and University Community. Under one scenario, the Campus and University Community would be annexed to the City of Merced in order to receive urban services, including water, wastewater, and fire protection in the case of both the Campus and the University Community, and also law enforcement in the case of the University Community. Although not certain at this time, there is a possibility that the UC Merced Police Department would serve the Community North portion of the University Community also. Because of the time involved in the annexation process and the uncertainty associated with it, the Campus will pursue a pre-annexation agreement with the City of Merced for the expansion of water and wastewater service to the next phase of campus development and that the agreement will also address fire protection service.

Under the other scenario, the remainder of the campus (outside of Phases 1 and 2) and the University Community would remain within unincorporated County and receive urban services from the County. The analysis below evaluates the effects of the Proposed Action and the alternatives on both City and County public services and recreational resources.

Public service providers in the Merced region were contacted to determine current operational service levels and whether there are existing service deficiencies. The Proposed Action's demand for public services was determined and compared to service providers' ability to meet the anticipated project-related demand. The full development of the Proposed Action was used to analyze impacts to public services and recreational facilities. Potential for each alternative to increase demand was also evaluated, as well as the effects of that increased demand on public services and recreational facilities.

4.11.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.11.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact PUB-1: The Proposed Action would increase demand for law enforcement services and would require the construction of new facilities. (*Less than Significant*)

Campus

As described above, the UC Merced Campus is served by the UC Merced Police Department. The UC Merced Police Department would expand service as development of the Campus continues. As discussed in the 2002 LRDP EIR, to maintain the right staffing level of 0.72 to 1.32 officers for every 1,000 population, 24.6 to 44.4 sworn officers would be required at full campus development (UC Merced 2002). Based on the experience at other UC campuses, adequate staff will be provided on the campus and the impact would be less than significant. However, **Mitigation Measure PUB-1** will be implemented to ensure that the impact remains less than significant.

The Campus land use plan includes adequate land for the expansion of the Campus police facility as needed. The environmental consequences of developing campus facilities, including additional police facilities, are evaluated in other sections of this Draft EIS/EIR and mitigated to the greatest extent feasible by the mitigation measures included in this Draft EIS/EIR.

University Community

Development of the University Community would result in an increased demand for law enforcement services in the project area. As discussed in the UCP EIR, based on the existing ratio of sworn officers in the County Sheriff's Department to the total County population, approximately 10 sworn officers would be needed to serve the University Community if the community were to be served by the County Sheriff's Department (Merced County 2004). However, if a more urban ratio of sworn officers to total population is used (1.32 officers per 1,000 residents), as required by UCP Policy PS 1.1, an additional 41 officers would be required to adequately serve the University Community site. This number is consistent with the City's service ratio and would also apply if the project site is annexed into the City and law enforcement service is provided by Merced PD. Development within the University Community would comply with UCP Policies PS 1.1 though 1.5, all of which are designed to ensure that adequate law enforcement service is provided to the University Community.

Neither the City nor the County have plans at this time to build a new police substation in northern Merced to provide law enforcement services to the University Community. However, the City has indicated that it is pursuing a plan to build additional fire stations in growth areas of the City and that these fire stations could be multipurpose and could include a police substation (Espinosa 2008). A new fire station is planned in northern Merced to serve the growth areas in northern Merced (see Impact PUB-2 below).

As noted earlier in this section, there is a possibility that Community North could be served by the Campus police department. As noted above, adequate land is provided within the Campus for the expansion of the Campus police station should it be necessary in order to serve Community North. Also, as noted earlier, the environmental impacts from the development of all Campus facilities, including police station expansion, are addressed in other sections of the Draft EIS/EIR and mitigated to the greatest extent feasible by the mitigation measures included in this Draft EIS/EIR.

If it is needed, a police facility is also planned within the University Community and land is allocated within the community for this use. The station planned as part of the University Community would allow the Merced PD or County sheriff's department to meet the target service standard of responding to high-priority calls on the project site within 3 minutes. Construction of a new police facility in the University Community could result in environmental impacts. These impacts are addressed in the analysis contained in other sections of this Draft EIS/EIR and mitigated to the greatest extent feasible by the mitigation measures included in this Draft EIS/EIR.

The City or the County would facilitate the construction of a new police facility to serve the University Community. The City could construct the new police facility on site or off site at a nearby location. If the City builds the new police facility off site, they would follow a similar environmental review process. Payment of developer impact fees for residential and non-residential development within the University Community would be required by the City to fund the new police station within the University Community or at an off-site location. Impact fees would also address any environmental mitigation required in conjunction with the construction of the police facility. These fees would be determined by the City prior to development on the University Community site. Collection of developer fees is provided for in the City's development review processes.

If the County constructs the new police facility, it would be located within the University Community site. County tax revenues would fund any new stations that would be constructed (Merced County 2004). In addition, owners of residential and non-residential property that would be developed within the University Community would pay property taxes that would fund the operating cost of the new station,

including the cost associated with hiring police officers. Therefore, the impact related to law enforcement would be less than significant and no mitigation is necessary.

Conclusion

For reasons presented above, the impact of the Proposed Action related to police facilities and services would be less than significant.

MM PUB-1: The Campus shall maintain a minimum ratio of 0.7 officer per 1,000 population. (*Applicability – Campus only*)

Significance after Mitigation: The mitigation measure proposed above would ensure that the impact remains less than significant.

Alt 1 – Impact PUB-2: The Proposed Action would increase demand for fire protection services and would require the construction of a new facility. (*Less than Significant*)

Campus

As described above, following the execution of a pre-annexation agreement with the City or upon the completion of the annexation process, the UC Merced Campus would be served by the City of Merced Fire Department. The nearest City Fire Station is Station 55, which currently has three fire fighters to staff its engine service. An additional engine staff (3) and a truck staff (4) would need to be added to this station to serve the project area. The City has indicated that Station 55 cannot be expanded to house another engine company. It further indicated that either a new fire station would be constructed on campus or in Community North to serve the Campus and University Community, or a new facility would be constructed somewhere in the Bellevue and G Street area to serve the site, as well as northern Merced growth. Because a site for this fire station has not been selected and the fire station would be built in response to the general northern Merced growth, and not solely to serve the Campus and the University Community, the environmental impacts of this future project will be evaluated and mitigated by the City of Merced in conjunction with the approval of the new fire station's development (or a fire station combined with a police station).

In the event that a fire station is built within the University Community, it would be managed by the City or as a University fire department. The fire station would provide service to the Campus and maintain a 5-minute response with a unit on scene 90 percent of the time (Mitten 2008). Construction of this facility could result in environmental impacts. These impacts are addressed in the analysis contained in other

sections of this Draft EIS/EIR and mitigated to the extent feasible by the mitigation measures included in this Draft EIS/EIR.

University Community

Development of the University Community would result in increased demand for fire protection services in the project area. The development of the University Community shall comply with UCP Policies PS 3.1 through 3.5, which specifically are designed to ensure fire protection service standards are met by the fire department in the project area. As described above, in the event of annexation into the City, the University Community would be served by the City of Merced Fire Department. Developer impact fees would be collected by the City from residential and non-residential development projects within the University Community to pay for the construction of new facilities, including the cost of environmental mitigation. These developer impact fees would be determined prior to construction of the projects within the University Community. Because collection of developer fees is provided for in the City's development review process, the impact related to fire protection services would be less than significant.

Should the University Community not be annexed to the City, the County would use tax revenues to fund adequate fire protection services for the community. In addition, owners of residential and non-residential property that would be developed within the University Community would pay property taxes that would fund the operating cost of the new fire station, including cost associated with hiring fire fighters and other staff and purchasing equipment. Therefore, the impact related to fire protection services would be less than significant.

Conclusion

For reasons presented above, the impact of the Proposed Action related to fire facilities and services would be less than significant and no mitigation is necessary.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact PUB-3: The Proposed Action would increase enrollment in local public schools, which would require construction of new facilities. (*Less than Significant)*

Campus and Community

The development of the campus would generate a demand for primary and secondary educational facilities. As stated in **Section 2.0, Project Description**, no faculty or staff housing would be built on the campus. Furthermore, in the early years, no student family housing would be provided on the campus; therefore, no student households living on the campus would generate primary or secondary school-age

students. However, during later phases of campus development, it is anticipated that some housing for students with families would be added such that by full development under the 2009 LRDP, approximately 1,250 students of the total 12,500 students that are housed on the campus would be living in student family housing. These student households would generate school-age children who would attend area schools. University-specific student generation rates were used to estimate the number of school-age children that would be associated with student families living on the campus (UC Merced 2002). As shown in **Table 4.11-3, School-Age Children Associated with Proposed Action,** approximately 463 school-age children (325 K–8 students and 138 high school students) would be associated with these student families.

Table 4.11-3
School-Age Children Associated with Proposed Action

Housing Units	K–8 student generation rate	Total students generated
1,250 student beds on Campus[1]	0.26	325
8,803 Single-family units in University Community	0.554[2]	4,877
2,814 Multifamily units in University Community	0.215	605
	Total K–8 Students	**5,807**
Housing Units	**9–12 student generation rate**	**Total students generated**
1,250 student beds on Campus	0.11	138
8,803 Single-family units in University Community	0.23	2,025
2,814 Multifamily units in University Community	0.1	281
	Total 9–12 Students	**2,444**
	Total K–12 students generated	**8,251**

[1] *1,250 UC Merced students on campus would be assigned to student family housing units.*

[2] *The Weaver School District only has a single-family dwelling generation rate. The district's Developer Fee Justification Study lists 0.581 as the generation rate for single-family units. No multifamily generation rate is listed because multifamily development has not occurred within the district boundaries in the last five years. It is not anticipated that multifamily units would be built in the district in the next five years. The Merced City School District (K-8) has a student generation rate of 0.526. Therefore, the average K-8 student generation rate for single-family homes on the project site of 0.554 was used to calculate the number of K–8 students in the table above.*

Table 4.11-3 also reports the number of school-age children associated with the University Community. For the University Community, the numbers were derived based on student generation rates provided by MCSD, WUSD, and MUSHD. At full development, based on these student generation rates and the number and types of dwelling units proposed within the University Community, campus-related

households would generate approximately 5,482 K–8 students and 2,306 high school students. Therefore, the Campus and University Community combined would generate 5,807 K–8 students and 2,444 high school students. The increased demand for school facilities is not considered an environmental impact. However, the increased demand in this case would require the construction of new school facilities, which in turn could result in environmental impacts.

The Campus has been in consultation with MCSD and the district has indicated that it will work with the University and UCLC to establish schools within the University Community to serve campus-related households. All needed school capacity to serve campus-related households would be provided by the schools that are planned within the University Community. Adequate land has been assigned within the University Community for the construction of a high school and up to four K–8 schools. The environmental impacts from developing the school sites are addressed in other sections of this Draft EIS/EIR and mitigated to the extent feasible by the mitigation measures included in the EIS/EIR. Furthermore, pursuant to SB 50, developers will be required to pay school impact fees for any residential and non-residential development proposed within the University Community. School impact fees are considered full and complete mitigation for school impacts. Therefore, the impact related to schools would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact PUB-4: The Proposed Action would increase demand for public libraries in Merced County. (*Less than Significant*)

Campus and Community

The increased population associated with the Proposed Action would result in increased demand for public library services in Merced County. However, the library system of the proposed campus, which would meet the needs of a modern research and teaching institution, and thus provide a large array of library services, would be available to students, staff, and faculty of the campus, as well as the general public on a limited basis. The proposed Campus would contribute to the library services available in the County, especially for adult non-fiction and reference materials, which would permit the County public library system to reallocate some resources away from adult needs and toward other types of materials, including resources for children. Furthermore, UCP policies would be implemented. UCP Policies PLC 1.1 and 1.2 recommend the County establish standards for libraries and for development of libraries within the University Community. Policies PLC 2.1 and 2.2 encourage joint use of library facilities, including coordination with the UC Merced Campus. Therefore, impacts on the Merced County library

system associated with development of the proposed University Community would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact PUB-5: The Proposed Action would result in an increased demand for parks and recreational facilities, but would not require the construction of new recreational facilities off site. (*Less than Significant)*

Campus and Community

The land use plan for the campus assigns 140 acres for athletic and recreational facilities. In addition, approximately 104 acres of passive open space uses are planned for the campus. Approximately 228 acres of parks and recreational facilities are planned for the University Community. Many of these facilities on the campus and in the University Community, including trails and bicycle paths, would be available to the general population of the surrounding area.

At full development of the campus under the 2009 LRDP, the campus would have a residential population of about 12,500 students and 1,875 dependents. No employees would reside on the campus. Recreational facilities and open space that would be developed on the campus would adequately serve the needs of the residential population, as well as the daytime population of the campus.

The University Community would result in a population increase of about 30,780 persons. Based on a minimum standard of 5 acres of parkland for every 1,000 residents consistent with UCP Policy PP 1.1 (which is also the City of Merced's minimum standard of 5 acres per 1,000 residents [Hall 2008]), the University Community would require approximately 154 acres of parkland to adequately serve its residential population. Approximately 228 acres of parks and open space are planned for the University Community which is substantially greater than the acreage required per the UCP policy or the City's minimum standard.

In total, the UC Merced Campus and University Community would provide a more than adequate amount of parkland for the proposed increase in population of this area. Consequently, the population increase would not result in demand for the construction of off-site recreational facilities. Secondly, with one exception, which is discussed below under Impact PUB-6, the Proposed Action would not trigger the construction of new parks or expansion of existing parks in areas outside of the Campus or the University Community. The environmental impacts from the development of all Campus and University Community lands, including those lands that would be developed with recreational facilities and open space, are addressed in the other sections of this Draft EIS/EIR and mitigated to the extent feasible by the

mitigation measures included in this Draft EIS/EIR. There would be no environmental impacts from the construction of new parks or expansion of existing parks off site. The impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact PUB-6: The Proposed Action would increase the use of Lake Yosemite Regional Park which could accelerate physical deterioration of park facilities. (*Potentially Significant; Less than Significant*)

Campus and Community

As discussed under Impact PUB-5 above, adequate land for parks and recreational facilities is included in both the Campus and the University Community land use plans to serve the on-campus residential population as well as the campus-related households that would reside in the University Community. Therefore, the Proposed Action is not expected to result in the excessive usage of off-site recreational facilities. However, due to the proximity of Lake Yosemite Regional Park to the Campus and University Community and the range of unique water-related recreational amenities offered at the regional park which would not be available in the Campus or University Community, it is anticipated that new on-campus student households would use the regional park. As stated in the UC Merced 2002 LRDP EIR, there is no measure available to estimate the level of usage that would represent overusage and would result in a corresponding deterioration of the park facilities. However, because the park is currently at capacity during summer months, this Draft EIS/EIR conservatively assumes that the use of the park by the campus-related households could accelerate the physical deterioration of the park facilities and contribute to the need for new park facilities. Although it is anticipated that most of the increase in park facility use associated with the campus (i.e., during periods in which the school is in session (i.e., Fall until Late Spring) would not coincide with the current peak park use which occurs during Summer, nonetheless the deterioration of existing park facilities could be accelerated and is considered a potentially significant impact associated with the Proposed Action. With respect to the population associated with the University Community, the County (or the City in the event that the University Community is annexed) will collect in-lieu park fees under the Quimby Act and a portion of those development fees could be allocated to regional park improvements.

As noted in Impact PUB-5 above, the University will develop on-campus recreational facilities, including shared use facilities such as on-campus sports, recreational, and parking facilities, as part of the overall campus development. Furthermore, the UCP Area Plan includes several policies (ALY 1.1 through 1.3; ALY 2.5 and 2.6; and ALY 3.1 through 3.3 listed in **Table 4.11-2**) to address the potential impacts on the

Lake Yosemite Regional Park from the development of the Campus and the University Community. Some of these policies would no longer be relevant due to the relocation of the campus such that it is no longer adjacent to the regional park. The remaining UCP policies would be implemented in conjunction with the development of the University Community. In addition, **Mitigation Measures PUB-6a** through **PUB-6c** are proposed to reduce the impact from campus development to a less than significant level. These mitigation measures and UCP Area Plan policies would focus on park improvements within the existing 233-acre park site and would not extend any improvements into adjacent County-owned lands that contain sensitive biological resources.

MM PUB-6a: The University shall work with the County to develop a program for joint use of on-campus sports, recreational, and parking facilities. (*Applicability – Campus only*)

MM PUB-6b: The University shall work with the County to avoid physical deterioration of existing facilities at Lake Yosemite Regional Park, and/or improve park facilities within the existing park site as necessitated by the increased uses associated with development of the Campus. (*Applicability – Campus only*)

MM PUB-6c: The University will pay its fair share of the cost of necessary improvements to the regional park The University's share of funding will be based on the percentage that on-campus residential population represents of the total population in eastern Merced County at the time that an improvement is implemented. (*Applicability – Campus only*)

MM PUB-6d: In recognition of the sensitive resources present on lands immediately adjacent to the regional park, all regional park improvement projects that are implemented by the County within 250 feet of the park's eastern boundary pursuant to **Mitigation Measures PUB-6b** and **PUB-6c** above, will implement mitigation measures to avoid and minimize indirect effects on biological resources. These measures shall be based on and as effective as the measures in the *Conservation Strategy* to control indirect impacts to biological resources. (*Applicability – Campus only*)

Significance after Mitigation: Implementation of these mitigation measures listed above would reduce the impact to a less than significant level. Furthermore, implementation of **Mitigation Measure PUB-6d** would avoid any substantial secondary impacts of these improvements.

4.14.6.2 Alternative 2 – Yosemite Avenue

Police and Fire Protection

Alternative 2 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced as the Proposed Action. Therefore, similar the Proposed Action, the environmental impacts of this alternative on police and fire services would be less than significant.

Schools and Libraries

Alternative 2 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population. Therefore, similar the Proposed Action and for the same reasons, the environmental impacts of this alternative on libraries and schools would be less than significant.

Parks and Recreation

Alternative 2 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced and Lake Yosemite Regional Park as the Proposed Action. Therefore, similar the Proposed Action, the environmental impacts of this alternative on recreational facilities would be less than significant. The alternative's impact on Lake Yosemite Regional Park would be potentially significant and would require the same mitigation measures, **Mitigation Measures PUB-6a** through **PUB-6d,** as the Proposed Action to reduce the impact to a less than significant level.

4.11.6.3 Alternative 3 – Bellevue Ranch

Police and Fire Protection

Alternative 3 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced, compared to the Proposed Action. Therefore, the environmental impacts of this alternative related to police and fire services would be generally similar to those described above for the Proposed Action. Because this alternative site would be served by City services and not County services, there would be no impacts on County police and fire departments or facilities. The impacts on City police and fire services would be less than significant for the same reasons presented above for the Proposed Action.

Schools and Libraries

Alternative 3 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced, compared to the Proposed Action. Therefore, the environmental impacts of this alternative related to schools and libraries would be generally similar to those described above for the Proposed Action. The impacts on school and libraries would be less than significant for the same reasons presented above for the Proposed Action.

Parks and Recreation

Alternative 3 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced, but slightly more distant from Lake Yosemite Regional Park, compared to the Proposed Action. Therefore, the environmental impacts of this alternative related to parks and recreation would be generally similar to those described above for the Proposed Action. The impacts on City parks and recreation services would be less than significant for the same reasons presented above for the Proposed Action. Despite the slightly greater distance between the Bellevue Ranch site and Lake Yosemite Regional Park, the alternative's impact on Lake Yosemite Regional Park would be potentially significant and would require the same mitigation measures, **Mitigation Measures PUB-6a** through **PUB-6d,** as the Proposed Action to reduce the impact to a less than significant level.

4.11.6.4 Alternative 4 – 2002 Proposed Project

Police and Fire Protection

Alternative 4 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population. Because police and fire service impacts are related to the size of project population, these impacts would be similar to those under Alternative 1. The impacts would be less than significant.

Schools and Libraries

Alternative 4 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population. Because school and library impacts are related to the size of project population, these impacts would be similar to those under Alternative 1. The impacts would be less than significant.

Parks and Recreation

Alternative 4 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population. Park and recreation service impacts are in part related to the size of project population; therefore, these impacts would be similar to those under Alternative 1. This alternative is also approximately the same distance from the City of Merced and Lake Yosemite Regional Park as the Proposed Action. Environmental impacts related to recreation of this alternative would be similar to those described above for the Proposed Action. Due to this alternative's proximity to Lake Yosemite Regional Park, the impact related to park usage would be potentially significant and would require the same mitigation measures **Mitigation Measures PUB-6a** through **PUB-6d,** as the Proposed Action to reduce the impact to a less than significant level. The primary difference is that this alternative would develop the campus on the County-owned parcel immediately east of the park, which would result in greater environmental impacts.

4.11.6.5 Alternative 5 – No Action

Police and Fire Protection

Under this alternative, the Campus and Community North would not be built. However, Community South could be developed based on development plans not related to the establishment of a UC campus in Merced. The types of impacts to police and fire protection services that would result under this alternative would be similar to those of the Proposed Action, but the magnitude of the impacts would be smaller (i.e., fewer police officers, fewer fire fighters) because a smaller population would be associated with this alternative. The impacts would be less than significant.

Schools and Libraries

Under this alternative, the Campus and Community North would not be built. However, Community South could be developed based on development plans not related to the establishment of a UC campus in Merced. The types of school and library service impacts that would result under this alternative would be similar to those of the Proposed Action, but the magnitude of the impacts would be smaller because a smaller population would be associated with this alternative. The impacts would be less than significant.

Parks and Recreation

Under this alternative, the Campus and Community North would not be built. However, Community South could be developed based on development plans not related to the establishment of a UC campus in Merced. The types of parks and recreation impacts that would result under this alternative would be

similar to those of the Proposed Action, but the magnitude of the impacts would be smaller because a smaller population would be associated with this alternative. The impacts would be less than significant.

4.11.6.6 Alternative 6 – No Build

Police and Fire Protection

As no new development would occur under the No Build Alternative, there would be no changes to the police and fire protection services provided to the project site. The impacts would be less than significant.

Schools and Libraries

As no new development would occur under the No Build Alternative, there would be no changes to the school and library services provided to the project site. There would be no new impacts.

Parks and Recreation

As no new development would occur under the No Build Alternative, there would be no changes to the parks and recreation services provided to the project site. The continued use of Lake Yosemite Regional Park by Phase 1 Campus population would not be of a magnitude to result in substantial deterioration of the park facilities. There would either be no new impacts or the impacts would be less than significant.

4.11.7 SUMMARY COMPARISON OF ALTERNATIVES

Alternatives 1, 2, 3, and 4 are identical in terms of the total population that would be added to the region by each alternative. Therefore, the public service impacts of these alternatives would be identical. The public service impacts would be of a lesser magnitude under Alternatives 5 and 6 as smaller populations would result under these two alternatives. With respect to the impact on Lake Yosemite Regional Park, the magnitude of impact would be the same under Alternatives 1, 2, 3, and 4. The magnitude of the impact on the regional park under Alternatives 5 and 6 would be smaller and less than significant.

4.11.8 REFERENCES

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4.12 SOCIOECONOMICS/ENVIRONMENTAL JUSTICE

4.12.1 INTRODUCTION

This section describes the socioeconomic conditions within eastern Merced County, and evaluates potential impacts to those conditions that could result from implementation of the Proposed Action (Alternative 1), three project development alternatives (Alternatives 2–4), a "No Action Alternative" (Alternative 5), and a "No Build Alternative" (Alternative 6). This section includes an analysis of whether the Proposed Action and alternatives would result in substantial population growth, disproportionately affect low-income or minority populations, or displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere.

Sources of information used in this analysis include:

- US Census Bureau data from the 2000 Census and American Community Surveys
- Department of Finance (DOF 2008)
- Merced County Association of Governments (MCAG 2007)
- 2002 Long Range Development Plan EIR (UC Merced 2002)
- 2004 University Campus Plan EIR (County of Merced 2004)

No public and agency comments related to socioeconomics; environmental justice; and population and housing were received in response to the Notice of Preparation or the Notice of Intent issued for this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

4.12.2 AFFECTED ENVIRONMENT

Due to the regional significance of the project, the County of Merced is considered the affected geographic area for socioeconomic impacts. The City of Merced could be further affected since the Campus and University Community sites may be annexed into the city. In addition, due to the Proposed Action's proximity to the City of Merced, that would be the community that would receive most of the Proposed Action's impacts. For impacts related to environmental justice, while the affected area is dependent upon the type of impact (air quality, noise, traffic, etc.) and the distribution of minority or low-income populations, all of Merced County is used in this Draft EIS/EIR as the study area.

4.12.2.1 Regional Setting

Population

The County of Merced consists of six cities (Merced, Atwater, Dos Palos, Gustine, Livingston and Los Banos) and unincorporated land. **Table 4.12-1, Merced County Population,** identifies the 2000 population figures provided by the US Census and the current (2008) population figures reported by the California Department of Finance. As shown in **Table 4.12-1**, the current (2008) population of Merced County is 225,250 residents, of which 87,001 individuals reside in unincorporated areas. The remainder of the county population resides in the City of Merced (80,608), the City of Atwater (27,571) and Dos Palos, Gustine, Livingston, and Los Banos (60,070, combined). Since 2000, the county's population has increased by 21 percent, the population of the unincorporated areas has increased by 12 percent, and the population of Merced, Atwater, and other cities has increased by 26 percent, 20 percent and 31 percent, respectively.

Table 4.12-1
Merced County Population

	2000 (US Census)	2008 (DOF)
City of Merced	63,991	80,608
City of Atwater	22,896	27,571
Other Cities*	45,717	60,070
Total Cities	132,604	168,249
Unincorporated Area	77,950	87,001
Total Merced County	**210,554**	**255,250**

Source: US Census Bureau; California Department of Finance
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*

Table 4.12-2, Merced County Population Projections, identifies the projected populations of the county, its cities, and unincorporated areas. According to Merced County Association of Governments (MCAG) projections, between 2008 and 2030, the countywide population is projected to increase by 45 percent to 417,200 residents; the population of the unincorporated areas is projected to increase by 75 percent to 152,500 residents; and the population of Merced, Atwater, and other cities is anticipated to increase by 45 percent, 55 percent and 75 percent, respectively during the same period.

The City of Merced anticipated growth within the Merced Specific Urban Development Plan (SUDP) in the currently adopted Merced Vision 2015 General Plan (2007). In this adopted general plan, the City

projected that the population of Merced would approach 145,000 persons by 2015, and 240,000 by 2035, which is a projected increase in population of 44 percent between 2008 and 2015, and approximately 198 percent between 2008 and 2035 (City of Merced 1997). The City's general plan is currently being updated, and anticipates inclusion of the entire Proposed Action in the Merced SUDP. Under the proposed general plan update, the population of the City is projected to grow to 280,666 residents by 2030 (Abramson 2008), a projected 248 percent increase in population over the current 2008 population of the City of Merced. The residential population associated with the Campus and University Community is included in the population numbers in **Table 4.12-2.**

Table 4.12-2
Merced County Population Projections

	2010	2015**	2020	2030	2035**
City of Merced (MCAG)	81,900		97,700	116,800	
City of Merced (General Plan)	---	145,000	---	---	240,000
City of Atwater	30,800		36,500	42,700	
Other Cities*	65,700		84,800	105,200	
Total for All Cities	178,400		219,000	264,700	
Unincorporated County	97,800		121,800	152,500	
Total Merced County	**276,200**		**340,800**	**417,200**	

Source: MCAG, 2007 Regional Transportation Plan for Merced County, (2007) 16.
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*
** *City of Merced 2015 General Plan*

Race and Ethnicity

Table 4.12-3, Merced County Population by Race/Ethnicity, lists the year 2000 county, city and unincorporated area populations of Merced County by race and ethnicity. Based on US Census data, the population of Merced County is identified as 45 percent Hispanic, 40 percent White, and 7 percent Asian. The remaining 8 percent of the population is identified as Black, Pacific Islander, Native American, Multiracial, or Other. The population of the unincorporated areas in the County is identified as 45 percent White, 45 percent Hispanic, and 5 percent Asian. The population of Merced, Atwater, and other cities in the county, combined, is identified as 37 percent White, 46 percent Hispanic, 8 percent Asian, 5 percent Black, 3 percent Multiracial, and less than 1 percent Pacific Islander, Native American, or Other.

Table 4.12-3
Merced County Population by Race/Ethnicity*
(Percent of Total Population)

	City of Merced		City of Atwater		Other Cities**		Total Cities		Unincorporated Area		Total Merced County	
White	23,875	(37%)	9,837	(43%)	15,988	(35%)	49,700	(37%)	35,107	(45%)	84,807	(40%)
Hispanic	26,529	(41%)	9,819	(43%)	24,563	(54%)	60,911	(46%)	34,699	(45%)	95,610	(45%)
Black	3,825	(6%)	1,178	(5%)	1,211	(3%)	6,214	(5%)	1,085	(1%)	7,299	(3%)
Asian	7,000	(11%)	1,234	(5%)	2,228	(5%)	10,462	(8%)	3,747	(5%)	14,209	(7%)
Pacific Islander	95	(<1%)	34	(<1%)	52	(<1%)	181	(<1%)	62	(<1%)	243	(<1%)
Native American	400	(1%)	78	(<1%)	215	(<1%)	693	(1%)	372	(<1%)	1,065	(1%)
Multiracial	2,098	(3%)	684	(3%)	1,259	(3%)	4,041	(3%)	2,743	(4%)	6,784	(3%)
Other	169	(<1%)	32	(<1%)	201	(<1%)	402	(<1%)	135	(<1%)	537	(<1%)
Total	**63,991**		**22,896**		**45,717**		**132,604**		**77,950**		**210,554**	

Source: US Census Bureau
* *Based on 2000 US Census data.*
** *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*

Housing

Table 4.12-4, Merced County Housing Stock, presents the number of dwelling units located within Merced County. As of January 1, 2008, there are 84,631 dwelling units within Merced County, of which 28,424 are located in unincorporated areas. The City of Merced contains 28,066 units, Atwater contains 9,529 units, and the remaining cities contain 18,612 units. As shown in **Table 4.12-5, Merced County Housing Projections**, according to MCAG projections, county-wide the number of dwelling units is projected to grow to 131,725 by 2030.

The City of Merced acknowledged in its approved general plan that in order to accommodate growth projected for the City's SUDP, approximately 47,000 additional housing units would be needed (City of Merced 1997). The City is currently updating its general plan and anticipates the total number of housing units within its revised SOI to increase to 95,689 by 2030 (It is important to note that this number includes the housing that would be provided within the Campus and University Community). As noted in the previous section, this increase in housing equates to 280,666 residents in the City of Merced by 2030.

Table 4.12-4
Merced County Housing Stock

	2000 (US Census)	2008 (DOF)
City of Merced	21,544	28,066
City of Atwater	8,089	9,529
Other Cities*	13,830	18,612
Total Cities	43,463	56,207
Unincorporated Area	24,910	28,424
Total Merced County	**68,373**	**84,631**

Source: US Census Bureau; California Department of Finance
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*

Table 4.12-5
Merced County Housing Projections

	2008	2020	2030
Merced County*	84,631**	105,610	131,725

Source: MCAG, 2007 Regional Transportation Plan for Merced County, (2007) 14.
* *Housing projections by city/unincorporated area are not available from MCAG.*
** *Source: California Department of Finance.*

According to the Merced County General Plan, housing vacancy rates historically have ranged from an average of 5.3 percent in 1990 to 5.5 percent in 2000. The general plan notes that a vacancy rate of 5 percent for rental housing and a vacancy rate of 2 percent for for-sale housing are desirable for normal mobility and these rates provide households with a reasonable range of choices when moving from one home to another. **Table 4.12-6, Housing Vacancy Rates**, presents available recent housing vacancy rates for Merced County based US Census Bureau American Community Surveys. The table also reports comparable vacancy rates for the state as a whole. As shown in the table below, housing vacancy rates for Merced County are higher than comparable rates for the state as a whole, and both the rental housing and the for-sale housing vacancy rates are higher than the rates typically targeted by communities for normal mobility. The table reflects the results of the housing boom that has occurred in Merced County and in all of California in recent years.

Table 4.12-6
Housing Vacancy Rates

Year/Housing Type	Merced County (%)	State of California (%)
2005		
Owner-occupied Housing	0.5	1.2
Rental Housing	5.8	4.6
2006		
Owner-occupied Housing	4.5	1.9
Rental Housing	5.8	4.6
2007		
Owner-occupied Housing	3.2	2.1
Rental Housing	6.3	4.7

Source: US Census Bureau; California Department of Finance
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*

Employment

Table 4.12-7, 2000 Merced County Employment, identifies the number of employed persons residing in Merced County in 2000 pursuant to the 2000 Census. The total number of employed residents in Merced County in 2000 was 75,335 persons, of which 19,163 resided in unincorporated areas. The remainder of the employed population resided in Merced (22,274); Atwater (8,858); and Dos Palos, Gustine, Livingston, and Los Banos (25,040, combined). According to MCAG, the number of jobs within Merced County totaled 75,300 in 2000. The number of jobs by city and unincorporated area is not readily available. As shown in **Table 4.12-8, Merced County Employment Projections**, based on MCAG projections, employment is anticipated to increase to 137,200 jobs in 2030.

Forecasts indicate that the population within Merced County will increase disproportionately to the number of jobs in the county (County of Merced 2007, 2-14). Therefore, unless additional jobs are created beyond the number projected, fewer workers per household and a lower income per capita are anticipated for the future. The unemployment rate in Merced County has also been high historically. Based on data from the California Employment Development Department (EDD) the average annual unemployment rates for Merced County have ranged between 9.5 percent and 15.2 percent in the last 10 years (EDD 2008). The current unemployment rate for 2008 is 12.2 percent.

Table 4.12-7
2000 Merced County Employment

	Employed Residents
City of Merced	22,274
City of Atwater	8,858
Other Cities*	25,040
Total Cities	56,172
Unincorporated Area	19,163
Total Merced County	**75,335****

Source: US Census Bureau
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*
** *MCAG reports a total of 75,300 jobs in Merced County in 2000, which is consistent with data provided by the US Census.*

Table 4.12-8
Merced County Employment Projections

	2010	2020	2030
Merced County*	95,200	116,800	137,200

Source: MCAG, 2007 Regional Transportation Plan for Merced County, (2007) 16.
* *Employment projections by city/unincorporated area are not available from MCAG.*

Poverty Status

The US Census determines poverty status based on the thresholds prescribed for federal agencies by Statistical Policy Directive 14, issued by the Office of Management and Budget. These thresholds take into account family size, the age of the individual(s), and income (US Census 2000). **Table 4.12-9, Individuals below Poverty Line (Year 2000),** shows the percentage of various Merced County populations below the poverty level. Based on 2000 Census data, the number of individuals considered to be below the poverty level within Merced County is 45,059 individuals, or 21 percent of the Countywide population. Within the City of Merced, 17,489 individuals, or 27 percent of the city population, are considered below the poverty level. Both percentages are higher than the percentage for the state as a whole which is 14.2 percent.

Table 4.12-9
Individuals Below Poverty Level (Year 2000)

	Individuals Below Poverty Level	Total Population	Percent Below Poverty Level
City of Merced	17,489	63,991	27%
City of Atwater	4,261	22,896	19%
Other Cities*	7,556	45,717	17%
Total Cities	29,306	132,604	22%
Unincorporated Area	15,753	77,950	20%
Total Merced County	**45,059**	**210,554**	**21%**
California	4,706,130	33,871,648	14.2%

Source: US Census Bureau
* *Other cities include Dos Palos, Gustine, Livingston, and Los Banos.*

4.12.2.2 Alternative 1 - Proposed Action Site

The Proposed Action site includes the Phase 1.1 Campus, which is developed with approximately 1,000 student beds. No faculty or staff housing is developed on the campus at this time. In addition, there are currently three dwelling units located on the Community South portion of the project site. There are no businesses situated on the project site.

4.12.2.3 Alternative 2 - Yosemite Avenue Site

This alternative site is similar to the site of the Proposed Action and includes student housing within Phase 1.1 Campus and the three dwelling units within the Community North portion of the site. There is no existing housing located on Community South under this alternative, and no businesses situated on this site.

4.12.2.4 Alternative 3 - Bellevue Ranch Site

The Bellevue Ranch site is approved for the development of between 4,843 and 6,648 dwelling units in several housing subdivisions in a number of development phases. At the present time, there are approximately 300 dwelling units and no businesses on this site.

4.12.2.5 Alternative 4 - 2002 Proposed Project Site

This alternative site is similar to the site of the Proposed Action, and includes the student housing on Phase 1.1 Campus and the three dwelling units within the Community South portion of the site. There are no businesses on this site.

4.12.3 APPLICABLE LAWS, REGULATIONS, PLANS AND POLICIES

4.12.3.1 Federal Laws and Regulations

Executive Order 12898

On February 11, 1994, the President issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The order focuses federal attention on the relationship between the environment and human health conditions of minority communities and calls on agencies to make achieving environmental justice part of their mission. The Order requires the US EPA and all federal and state agencies receiving federal funds to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. It also requires the agencies to develop strategies to address this problem.

4.12.3.2 Local Plans and Policies

The Proposed Action consists of the development of the Campus and the University Community. Lands on which the campus would be built are owned or will be owned by The Regents of the University of California. UC Merced is generally exempted by the state constitution from compliance with local laws and regulations. The plan that is applicable to the campus is the proposed UC Merced 2009 Long Range Development Plan (2009 LRDP), and relevant policies contained in the proposed 2009 LRDP are listed below.

The University Community lands on the other hand are privately owned and are subject to local laws, regulations, and policies. Relevant policies from the previously adopted University Community Plan (UCP), and City and County plans, policies, and regulations related to socioeconomics and environmental justice are summarized below.

Merced County General Plan

The Merced County Year 2000 General Plan outlines the County's goals and desires concerning land use and is designed to serve as the basis for development decision-making. The plan directs the physical

growth and development of the County through the Year 2000. It contains policies that are relevant to development of the UC Merced Campus. Policies that are intended to guide the socioeconomic aspects of campus development are listed below.

Housing Element

Objective 1b: Minimize the conversion of productive agricultural land.

Policy 1: Conversion of agricultural and other rural land, including antiquated subdivisions into housing uses shall only be allowed where a clear and immediate need is demonstrated based on anticipated growth, availability of public services and facilities, and taking into account available vacant land within the community.

UC Merced 2009 Long Range Development Plan

The UC Merced 2009 LRDP contains the following policy related to housing.

COM-5: Ensure a supply of housing adequate to offer housing to 50 percent of full-time equivalent (FTE) student population and allocate a range of housing types to accommodate undergraduate students, and graduate students.

University Community Plan

The adopted UCP contains the following policies related to housing, employment and other socioeconomic factors.

Table 4.12-10
UCP Policies

LU 1.1	Accommodate a mix of land uses to support the UC Merced campus and its induced population growth that are economically feasible and supported by the marketplace, designated as "Multiple Use Urban Development (MUUD)." These may include housing, retail, offices, industrial, visitor-serving accommodations, entertainment, cultural, recreational, public/civic, institutional, education, and related uses. In particular, emphasize the attraction of businesses that uniquely capitalize upon the presence of the University, its education, innovation, and culture, which would not have otherwise been supported by the marketplace.
LU 1.2	Accommodate the development of a mix of land uses that sustains and supports the daily needs of residents living in the University Community and contributes to the sense of complete neighborhoods offering a variety of housing types, supporting convenience goods and services, job opportunities, schools, parks, and open spaces.

LU 1.3	Accommodate land uses that complement and enhance the local and regional economic vitality and are coordinated with the City of Merced and other major business centers. Uses that serve the region and are not uniquely related to the campus environment and economy, such as "big box" retail, and whose development would adversely impact the City and other areas shall be discouraged.
LU 5.6	Encourage the development of senior housing within the Town Center.
LU 6.1	Accommodate the development of a University-related Business Center that contains research and development, light manufacturing, electronic/digital, and other uses that provide job opportunities that uniquely are induced by the presence of the UC Merced Campus.
LU 6.2	Encourage the development of buildings and facilities that support the formation of business incubators capitalizing upon the University's faculty and research.
LU 6.3	Work with local business to train local residents to take advantage of new job opportunities that may be developed in the University Community.
LU 6.5	Allow for the development of new types of industries as they evolve in the marketplace, provided that they complement existing uses and the University of California, Merced.
LU 7.1	Integrate a mix of housing types within each Residential Village with supporting schools, parks, retail, and other uses that support local needs.
LU 7.3	Distribute the mix of single- and multi-family units among the Residential Villages. Allow for modification of the mix of units to reflect resident needs, market conditions, innovation, and creativity provided that the character and quality of the village is maintained and basic requirements for the development of a mix of units to meet the needs of a spectrum of resident income demographics are met.
H 1.2	Allow for flexibility in the mix of housing units to be accommodated to reflect market and affordability needs as those needs evolve during the buildout of the University Community.
H 1.7	Ensure that the Community's housing capacity is sufficient to support the employment generated by UC Merced, businesses, and industries and correlate the mix of units to their income levels, offering a variety of rental and ownership opportunities.
H 2.1	Foster the development of a variety of housing types to serve the needs of residents in consideration of household size, age, incomes, special needs, cultures, and other relevant factors. These may encompass affordable, single-family detached and attached residences, multifamily rental and ownership units, condominium, co-housing, cooperatives, live/work, second units, senior, intergenerational housing, units integrated with nonresidential uses, student housing, and similar units. A range of housing units to support a diversity of household sizes and incomes shall be accommodated in each Residential Village.
H 3.3	Work with local private and nonprofit developers (e.g., Merced College "Build-A-House" Project) to finance, design, and construct housing to meet special needs. Such projects might include, but are not limited to, senior housing, including congregate care facilities; housing for people with physical and mental disabilities; and housing for large families.
H 5.1	Develop a Housing Program for each specific plan area that commits to the development of adequate affordable housing, facilitates access by low-income households, and promotes its long-term affordability to meet Community needs. The program shall be consistent with the provisions of the County of Merced Housing Element in consideration of housing affordability in the greater Merced market. It shall be a condition of approval for the sub-area specific plans and include actions that may be undertaken by a diversity of entities including the County of Merced, the Housing Authority, other agencies, and private developers. A variety of elements may be incorporated including land use development strategies, production of affordable units by developers and other entities, contribution of in-lieu fees to a separate housing development entity, regulatory and programmatic approaches, and financial assistance to buyers and renters.

H 5.1.5:	The development of affordable housing by project developers through: • The use of "inclusionary zoning," wherein the developer is required to produce a stipulated percentage of the total housing units for low- and very low–income households (120 percent and 80 percent of the County median household income, respectively); • Provision of development density bonuses when specified minimums are exceeded; and/or • Contribution of an in-lieu fee, based on the calculation of the value of the required affordable units, to the County or other entity (e.g., nonprofit) for the construction of affordable units. At a minimum, the developer shall be responsible for the provision of sufficient affordable units, as determined by the County, through construction or in-lieu fees.

4.12.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under NEPA is summarized in **Section 4.0, Affected Environment and Environmental Consequences.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidance regarding the determination of environmental consequences to identify impacts. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this EIS/EIR, impacts related to socioeconomics, population and housing, and environmental justice would be significant if implementation of the Proposed Action or its alternatives would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere; or
- Result in disproportionate, adverse environmental effects on a minority or low-income population.

4.12.5 METHODOLOGY FOR EVALUATING EFFECTS

Various data sources were reviewed to describe existing conditions in the project region related to population, race and ethnicity, housing, employment, and poverty status.

Several guidance documents have been prepared by various federal agencies to guide the evaluation of impacts of a proposed action on minority and low-income populations. CEQ guidance "Environmental Justice Under the National Environmental Policy Act" dated December 1997 and the US EPA "Toolkit for

Assessing Potential Allegations of Environmental Injustice" dated November 2004 were consulted in evaluating the Proposed Action's effects relative to Executive Order 12898.

The following criteria were used to determine if any geographic areas within the project region contain a high concentration of a "minority or low-income population."

4.12.5.1 Minority Population

As defined in Executive Order 12898 and the CEQ guidance, a minority population occurs where one or both of the following conditions are met within a given geographic area:

- The American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic population of the affected area exceeds 50 percent, or
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

A minority population also exists if more than one minority group is present and the aggregate minority percentage meets one of the above conditions. The selection of the appropriate unit of geographic analysis could be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit.

4.12.5.2 Low-income Population

Executive Order 12898 does not provide criteria to determine if an affected area consists of a low-income population. For the purpose of this assessment, the CEQ criterion for defining a minority population has been adopted to identify whether or not the population in an affected area constitutes a low-income population. An affected geographic area is considered to consist of a low-income population where the percentage of low-income persons

- is at least 50 percent of the total population, or
- is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

As shown in **Table 4.16-3** above, the population of Merced County is identified as 45 percent Hispanic and 40 percent White, while the population of the City of Merced is 41 percent Hispanic and 37 percent White. Although the Hispanic population represents a multiracial group and includes several races and the Hispanic population cannot be directly aggregated with other minority populations that are single race populations (Black, Asian, Pacific Islander, etc.) as it would result in double counting, however, because it is a designated minority group, for purposes of this analysis, it was aggregated with other minority groups. Based on this, the aggregate minority population of the City of Merced is 59 percent and

for the County is 56 percent. The aggregate population percentages for both the City of Merced and Merced County therefore meet the first criterion and a minority population does exist within the study areas. Furthermore, based on the second criterion, there is a disproportionate presence of the Hispanic population in the Merced region. While Hispanics form 32 percent of the state's population, that percentage is 45 percent for all of Merced County and 41 percent for the City of Merced (US Census 2000).

With respect to the presence of low income population within the study area, an affected geographic area is considered to consist of a low-income population (i.e., below the poverty level, for purposes of this analysis) where the percentage of low-income persons is at least 50 percent of the total population, or the percentage is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis. As shown **in Table 4.12-9, Individuals Below Poverty Level (Year 2000),** based on the 2000 US Census, 21 percent of the Merced County population and 27 percent of the City of Merced population are considered below the poverty level. Although individuals below the poverty level represent a prominent percentage of both populations, neither the City nor County meets the first criterion. However, for the state of California as a whole, approximately 14 percent of the population is below the poverty level, as shown in **Table 4.12-9**. Compared to the general population percentage of low-income people in the state of California, there is a disproportionate presence of low-income people in the City of Merced and Merced County. In summary, in the broader study area which comprises the County and the City as a whole, an "environmental justice (EJ)" community does exist in the project area. However, if the immediate vicinity of the Proposed Action is examined, the area is developed with ranch houses and some of the more expensive housing in Merced which indicates that an EJ community is not present immediately adjacent to the project site.

The Proposed Action's effects on the EJ community in the project area are evaluated below for their potential for disproportionately high adverse effects on (1) environmental conditions such as quality of air, water and other environmental media; degradation of aesthetics, loss of open space, and nuisance concerns such as odor, noise, and dust; (2) human health such as exposure of EJ populations to pathogens; and (3) public welfare in terms of social conditions such as reduced access to certain amenities like hospitals, safe drinking water, public transportation, etc; and economic conditions such as changes in employment, income, and the cost of housing, etc., as a result of the Proposed Action. All of these effects are evaluated both in terms of the Proposed Action's direct and indirect impacts as well as in the context of the cumulative conditions that currently exist in the study area.

4.12.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.12.6.1 Alternative 1 - Proposed Action

Alt 1– Impact SOC-1: The Proposed Action Alternative would directly induce substantial population growth in Merced City and Merced County. (*Significant; Significant and Unavoidable*)

As noted above under the significance criteria for evaluating environmental effects, the Proposed Action's impact related to population would be significant if the Proposed Action induced substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure). The direct increase in population from the development of the Campus and University Community is evaluated below. Population growth indirectly induced through extension of roads or other infrastructure is addressed in **Section 6.0, Growth-Inducing Impacts**.

Campus

Table 4.12-9, Campus Housing, Population and Employment, summarizes enrollment, employment and housing at UC Merced under current and future conditions. As of fall 2008, approximately 2,700 FTE students attend UC Merced. The analysis for population growth conservatively uses the total student enrollment and total employee population of the Campus at buildout to address potential impacts and not just the increase over existing conditions (see **Section 4.0**).

Table 4.12-11
Campus Housing, Population, and Employment

	Fall 2008	2030
Beds (students only)	1,000	12,500
Student Population	2,700	25,000
Faculty and Staff	730*	6,560**

**This number does not include post doctoral researchers.*
*** This number includes post doctoral researchers*

At campus buildout, enrollment is anticipated to reach the maximum capacity of 25,000 students. These students would be from the City of Merced, greater Merced County, and other parts of the state and country. Based on the assumption that 90 percent of the students enrolled at the campus would be from

outside Merced County, the population of the City of Merced[1] and County of Merced would increase by 22,500 student residents (see **Section 4.0**). This is approximately a 28 percent increase in the current (2008) population of the City of Merced and approximately a 9 percent increase in the current population of Merced County. However, it is anticipated that the student population present in the area would decrease during the summer months when the campus is not in session.

Some of the students relocating from outside Merced County (22,500 students) would be accompanied by a certain number of dependents. It is assumed that 10 percent of students would have families, each with 1.5 dependents (see **Section 4.0**). Therefore, a population of 3,375 dependents would accompany the student population relocating to Merced County. Combined, a population of 25,875 students and their dependents are anticipated to relocate to Merced County. Half of the students would live on the campus and the remainder in the housing provided in the University Community. If these students and their dependents are added to current population in the City and the County, they would represent an increase of approximately 32 percent in the current population of the City of Merced and approximately a 10 percent increase in the current population of Merced County.

At full development of the campus, employment is anticipated to increase to a maximum of 1,420 faculty, 4,828 staff, and 312 post doctoral researchers, for a total of 6,560 persons. Faculty, staff, and post doctoral researchers (hereinafter employees) could originate from the City of Merced, greater Merced County, and other parts of the state and country. All employees associated with the Campus would live off campus as no on-campus housing for employees is planned. Based on the assumption that 70 percent of the faculty, staff, and post doctoral researchers would relocate from outside Merced County (see **Section 4.0**), the population of the City of Merced and County of Merced would increase by 4,592 residents. This is approximately a 6 percent increase in the current population of the City of Merced and approximately a 2 percent increase in the current population of Merced County.

The faculty, staff, and postdoctoral researcher population relocating from outside Merced County (4,592 employees) would be accompanied by dependents. As discussed in **Section 4.0**, a household size of 2.65 persons per household was used to estimate the dependents of the campus faculty, staff, and postdoctoral researchers. Based on an average of 1.65 dependents per employee, employees relocating to the project area would have 7,577 dependents (See **Section 4.0**). Combined, a population of 12,169 employees and their dependents are anticipated to relocate to the project area. This represents approximately a 15 percent increase in the current population of the City of Merced and approximately a 5 percent increase in the current population of Merced County.

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1 Because the Campus and the University Community may be annexed into the City of Merced, the increase in population due to the Proposed Action is discussed relative to the population of Merced County as well as the City of Merced.

Based on the above calculations, a total of 38,044 students and employees, and the dependents of each group would be drawn to the City of Merced and Merced County from other locations. This is a 47 percent increase in the current population of the City of Merced and a 15 percent increase in the current population of Merced County. The current population of the City of Merced would increase to 118,652 residents and the current population of Merced County would increase to 293,294 residents as a result of students, employees, and their dependents relocating to the campus due to implementation of the Proposed Action.

MCAG projects that the City of Merced population will be 116,800 residents by 2030 and the Merced County population will be 417,200 residents. While the population increase due to full development of the campus is already accounted for in the MCAG projections for the City and the County, and the population increase has been included in the City's general plan projections (both the existing general plan and the update that is underway which actually includes a higher population projection for the city than MCAG projections), the increase due to the Proposed Action would represent a substantial increase in the population of the City and the County. Therefore, the direct population increase due to Campus development would represent a significant impact.

University Community

The University Community has been designed to accommodate growth induced by the Campus. **Table 4.12-10, University Community Population, Housing, and Employment,** summarizes the housing and employment characteristics of the University Community.

Table 4.12-12
University Community Population, Housing, and Employment

	Community North	Community South	Total
Residential Population	15,351	15,431	30,782
Dwelling Units	5,794	5,823	11,616
Number of Jobs	9,307	1,025	10,332

As previously discussed, the Campus would draw 38,044 students, employees and dependents to the Campus vicinity. The Campus would provide on-campus housing for 12,500 students and it is assumed that at least 10 percent of the total student body (2,500 students) would already be living in the Merced area at the time that they first enroll at the Campus. The remainder of students (10,000 students), as well as all of the non-local relocating employees (4,592) would require off-campus housing. While some of the campus-induced non-local population might choose to live outside the University Community, it is

expected that the majority of this population would be attracted to the University Community due to its proximity to the Campus (as is the case in other communities around UC campuses). Assuming three single students per dwelling unit, one student family per dwelling unit, and 1.1 employees per dwelling unit, campus-related population would require approximately 8,175 dwelling units (see **Table 4.0-4, Off-Campus Housing Demand at Full Development** in **Section 4.0**). Per the previously adopted community plan and the current proposal, the University Community has been designed to provide up to 11,616 housing units. Therefore, adequate housing is included in the University Community to serve the campus population. The 3,441 housing units that would be available in the University Community would provide housing for some of the employees who have jobs in the University Community (See **Section 6.0**).

The University acknowledges that in the short term, campus-related population would not reside within the University Community as no housing has been developed in that area so far. Since the inception of the campus in 2002, no housing has been approved or developed within the University Community and, except for some of the students, the campus-related population currently resides in existing off-campus housing. However, as described in **Section 2.0, Project Description**, the University and UCLC have developed a phasing plan for Community North so that adequate housing is developed within Community North in a timely manner to serve the housing needs of the Campus. Should the development of the University Community not keep pace with the development of the Campus, the housing needs of the campus employees as well as students would be accommodated by the housing that has already been developed or is planned for in this portion of Merced County. As noted above, planned/approved development projects within the City at present include up to 10,368 additional residential units within subdivision projects. Per the City of Merced General Plan Update growth projections, the City of Merced has planned for the development of 95,689 housing units by 2030. This includes the housing units proposed within the University Community.

Conclusion

In summary, buildout of the Campus would induce population growth by drawing 38,044 students, faculty, staff, post doctoral researchers and the dependents of each group to the campus area. Based on MCAG population projections, this would represent a substantial population increase within the City and County of Merced.

The primary concern with a substantial population increase due to a project is the potential for that increase to result in environmental impacts. However, the University Community which is a component of the Proposed Action would provide all of the housing, retail, and public service needs of this new population including the indirect/induced population. The environmental impacts from the development

of the University Community are evaluated in the various technical sections of the EIS/EIR and mitigated by the mitigation measures included in those sections. Because all environmental impacts would not be reduced to a less than significant level, the impact from population growth generated by the Campus and University Community together would be significant and unavoidable.

Mitigation Measure: No feasible mitigation measures are available.

Significance after Mitigation: Significant and unavoidable

Alt 1– Impact SOC-2: The Proposed Action Alternative would not displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. (*Less than Significant*)

Campus

Except for student housing on the Phase 1.1 Campus, no dwelling units are currently situated on the campus site. Since no existing housing would be displaced, there would be no impacts related to construction of replacement housing.

University Community

Three dwelling units are currently located in the Community South portion of the University Community site. It is assumed that, as part of the Proposed Action, these three dwelling units would be removed to accommodate the development of the University Community. However, 11,616 units would be developed under the Proposed Action, which would more than offset the loss of housing stock created by the removal of three residences. Therefore, since a substantial number of existing housing would not be displaced, impacts from the construction of replacement housing would be less than significant.

Conclusion

Three dwelling units are currently situated on the project site. These units would be removed under the Proposed Action. Since a substantial number of existing housing would not be displaced, the impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact SOC-3: The Proposed Action Alternative would not displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. (*Less than Significant*)

Campus

No dwelling units or businesses are currently situated on the campus site. Since no population would be displaced, impacts would be less than significant.

University Community

Three dwelling units are currently situated on the University Community site. These units would be removed with University Community development. Assuming a household size of 3.34 persons per household (US Census Bureau 2007 data for Merced County), a total of 10 persons would be displaced. Since only a small number of persons would be displaced, the impact would be less than significant.

Conclusion

Since only a small number of persons would be displaced as a result of the removal of three dwelling units within the project site, the impact would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact SOC-4: The Proposed Action Alternative would not result in disproportionate, adverse environmental effects on minority or low-income populations. (*Less than Significant*)

Campus and University Community

As described above under significance criteria for evaluating environmental impacts, a minority population exists where the American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic population of the affected area exceeds 50 percent, or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. A minority population also exists if more than one minority group is present and the aggregate minority percentage meets one of the above two conditions.

As discussed above, the aggregate population percentages for both the City of Merced and Merced County meet the first criterion. Furthermore, based on the second criterion, there is a disproportionate presence of the Hispanic population in the Merced region. While Hispanics form 32 percent of the state's

population, that percentage is 45 percent for all of Merced County and 41 percent for the City of Merced (US Census 2000).

With respect to the presence of a low-income population within the study area, an affected geographic area is considered to consist of a low-income population (i.e., below the poverty level, for purposes of this analysis) where the percentage of low-income persons is at least 50 percent of the total population, or the percentage is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis. As discussed above, 21 percent of the Merced County population and 27 percent of the City of Merced population are considered below the poverty level. Although individuals below the poverty level represent a prominent percentage of both populations, neither the City nor County meets the first criterion. However, for the state of California as a whole, approximately 14 percent of the population is below the poverty level. Compared to the general population percentage of low-income people in the state of California, there is a disproportionate presence of low-income people in the City of Merced and Merced County.

Based on the above, the two study areas for the Proposed Action (Merced County and the City of Merced) contain a concentration of both minority populations as well as low-income populations. Therefore, an EJ community does exist in the broader study area although, as explained in **Subsection 4.12.5,** not in the immediate vicinity of the project site.

The potential for the Proposed Action to result in disproportionate impacts on the EJ community is evaluated below relative to changes in environmental, human health, social and economic conditions due to the Proposed Action, all of which can singly or collectively result in EJ impacts.

Environmental Conditions

The environmental conditions that are of concern for purposes of an EJ evaluation include air quality; water quality and quantity; other environmental media such as soils; degradation of aesthetics; loss of open space; and nuisance concerns such as odor, noise, and dust.

The impacts of the Proposed Action on regional and local air quality are evaluated in **Section 4.3, Air Quality**. As that analysis shows, development of both the Campus and the University Community would result in significant impacts from construction and operational emissions that would exceed air quality emission thresholds. Although **Mitigation Measures AQ-1** and **AQ-2** require that emissions directly and indirectly associated with the Proposed Action are adequately accounted for and mitigated in applicable air quality planning efforts, the estimated emissions would result in a significant and unavoidable impact. The air emissions associated with the Proposed Action are diffuse as they are associated with vehicle trips and would affect the air basin as a whole. Note that few stationary sources of emissions are

associated with the proposed Campus and University Community and therefore the Proposed Action would not result in pollutant concentrations that could affect an EJ community. Furthermore, concentrations typically are high in the immediate vicinity of a polluting stationary source, or in the case of dust, in the vicinity of the construction site. There is no EJ population present in the immediate vicinity of the Proposed Action's stationary sources. Also, as noted in **Section 4.3**, there are no sources of odors associated with the Proposed Action. In the event that a wastewater treatment plant is proposed in the future, it would be located to avoid off-site and on-site odor impacts. In summary, the EJ community present in the broader study area would not be disproportionately affected or exposed to high concentrations of air pollutants.

The impacts of the Proposed Action on aesthetics are discussed in **Section 4.1, Aesthetics** and **Section 5.0, Cumulative Impacts**. As the analyses in those sections show, development of the Proposed Action would interrupt view corridors and alter the visual quality of the project area. Although mitigation is provided to reduce these impacts, the loss of views and change in visual quality is still considered significant and unavoidable. Additionally, both the Campus and University Community would add new sources of nighttime illumination. All of the adverse impacts would be felt by the population at large and would not disproportionately affect minority and low-income populations. Furthermore, as noted above, the community in the immediate vicinity of the proposed site that would be the most affected population is not an EJ community.

The Proposed Action's effects on water quality and quantity (both surface and groundwater) are evaluated in **Section 4.8, Hydrology and Water Quality**, **Section 4.14, Utilities and Service Systems**, and **Section 5.0, Cumulative Impacts**. The analyses in those sections show that with the incorporation of policies, the Proposed Action would not adversely affect surface water quality or groundwater quality. The Proposed Action would in conjunction with other growth in the area result in a significant impact on the groundwater basin. Given the nature of this effect, it would be experienced by all users within the broader study area and would not disproportionately affect an EJ community.

Human Health Conditions

The Proposed Action consists of the development of a research university and an associated and contiguous community to serve the campus. The vast majority of land uses and activities that would be contained within the Campus and University Community would not involve use of chemicals and other hazardous materials that could expose EJ populations to pathogens that can result in human health effects. The research and development (R&D) land uses located in the Gateway District of the Campus and Community North as well as research laboratories located in other parts of the campus, including the potential future medical school, would involve the use of hazardous materials, some of which would

result in air emissions that could affect off-site populations. Appropriate controls consistent with federal, state and local laws and regulations would be implemented to avoid emissions in excess of allowable levels by the permitting agencies. However, as described in **Section 5.0**, the cumulative human health risk impact from exposure to toxic air contaminants from these uses cannot be estimated because the details of the actual types of laboratory uses (including the types and quantities of chemicals that would be used) that would be located on the Gateway area of the Campus and University Community as well as in adjacent off-site areas are not known at this time. Conservatively, it is assumed that the cumulative impact from the operation of these R&D facilities would be potentially significant. However, the Proposed Action's contribution to the cumulative risk is not expected to be cumulatively considerable based on data from other UC campuses with similar site conditions and similar concentrations of research facilities. For instance, according to the 2003 LRDP EIR prepared for UC Davis which evaluated impacts from the growth of the campus through 2015 to an enrollment level of 30,000 FTE students, the cumulative human health risk from all on-campus sources (existing and future research laboratories, boilers and generators, on-site landfill, a cogeneration plant, etc. for a total of more than 100 individual sources) was determined to be less than 8 in 1 million. (According to the air districts, this impact is considered significant if the probability of contracting cancer for the Maximally Exposed Individual [MEI] exceeds 10 in 1 million) (UC Davis 2003). Therefore, the Proposed Action is not expected to adversely affect human health of any population. There would be no disproportionate adverse human health impacts on the local EJ community.

Social and Economic Conditions

As noted earlier, public welfare of an EJ community can be adversely affected via effects on social conditions such as reduced access to certain amenities like safe drinking water, public transportation, etc.; increased traffic congestion resulting in isolation of individuals from a broader community; displacement of persons, farms, businesses, or disruption of an established community; or effects on economic conditions such as changes in employment, income, and the cost of housing, etc., as a result of the Proposed Action.

Although as briefly discussed above and in more detail in **Section 5.0**, the Proposed Action would increase the regional population and increase the demand for groundwater, resulting in a significant cumulative impact, it would not otherwise affect the availability of safe drinking water in the area which is obtained from the Merced groundwater basin. None of the uses included in the Proposed Action would adversely affect groundwater quality by releasing contaminants into groundwater, and thus safe drinking water for the local EJ community and the community at large would not be affected.

The Proposed Action would increase the use of public transportation within the Merced area. However, the 2009 LRDP includes a number of policies to enhance and improve public transportation in the project area. LRDP Policy MOB-1 requires the campus to ensure that the transportation infrastructure will adequately serve campus circulation needs, and provide appropriate connectivity to adjacent areas while minimizing impacts to those areas. LRDP Policy MOB-13 requires the campus to work with local and regional transit providers to coordinate transit service, and establish convenient transfers between transit and other modes of travel and to integrate transit corridors with the City of Merced transit corridors. The UCP also includes policies to improve public transportation. The increased use of public transportation by the project-related population would not reduce the availability of public transportation for the EJ community.

The traffic and transportation impacts of the Proposed Action are evaluated in **Section 4.13, Transportation and Traffic**. The additional vehicular traffic added by the Proposed Action would result in significant traffic congestion at three study intersections and contribute at least one percent or more to the growth in traffic along 19 roadway segments in the City of Merced SOI, resulting in a significant impact. None of these impacts are of the nature that they would cause minority or low income populations to be isolated from the broader community. Furthermore, traffic improvements are available that would help reduce congestion at these locations. A disproportionate adverse impact on an EJ community is not indicated.

As discussed above under Impacts SOC-2 and SOC-3, the Proposed Action would not displace a large number of homes, businesses, or people, nor would result in the disruption of an established community. There would be no such effects on an EJ community present in the area.

The Proposed Action would affect local economic conditions through its effects on employment, income, and the cost of housing. The Proposed Action would create and/or support up to approximately 6,500 jobs on the campus and another 10,000 jobs within the University Community. While the majority of the faculty positions on the campus and some of the R&D jobs in the University Community would be expected to be filled by non-local persons who would relocate into the Merced area in response to the jobs, the vast majority of staff positions on the campus and the jobs within the University Community would be filled by local workers. Given the relatively high unemployment rates in the county, the Proposed Action would have a beneficial effect on regional unemployment. As jobs at the campus would be relatively high paying jobs, the Proposed Action would also have a beneficial effect on income levels. Minority and low-income populations would have equal access to these job opportunities. Furthermore, the Campus is proposed in Merced specifically to serve the currently under-served San Joaquin Valley. The Campus would provide educational opportunities to residents of the City of Merced, Merced County, and the greater Central Valley. This education would further improve the ability of the valley's

minority and low-income populations to secure employment at the Campus, in the University Community, and in the broader study area.

Similarly, the University Community would economically benefit the populations of the City of Merced and Merced County by providing various employment opportunities, public services and a range of housing types, including affordable housing. As stated in UCP Policy LU 6.1, the Community would accommodate land uses that complement and enhance the local and regional economic vitality and are coordinated with the City of Merced and other major business centers. Additionally, development of Community North would generate revenues to fund scholarships awarded to local high school students by the Virginia Smith Trust.

Until the University Community is fully built, the Campus would increase the demand for housing, which could reduce vacancy rates and increase rents and the prices of for-sale homes in the vicinity of the Proposed Action. Although a short-term economic recovery is considered unlikely at this time given the high housing vacancy rates in Merced and the condition of the state and regional economy as of this writing, should the regional economy improve substantially in the short term, the demand for housing associated with the Proposed Action may cause rents and housing prices to increase, and could thereby result in a potentially disproportionate effect on low-income populations in the short term. However, it is unlikely that these events would occur in the short term and in the vicinity of low-income populations, none of which are geographically clustered near the Proposed Action. In the long run, adequate housing would be provided within the University Community which would enhance the supply of housing in the region and result in prices and rents that are affordable to all populations. Furthermore, the UCP contains several policies that would be implemented to provide adequate affordable housing.

Conclusion

Based on the analysis above, although minority and low-income populations are present in high numbers within the study area, none of the significant environmental impacts of the Proposed Action would disproportionally affect these populations. In summary, the Proposed Action would not result in substantial adverse and disproportionate impacts on low-income and minority populations.

Mitigation Measure: No mitigation is required.

4.12.6.2 Alternative 2 - Yosemite Avenue

Impact related to Population Growth

Under this alternative, enrollment, employment, and housing would be the same as under the Proposed Action. The University Community would serve all of the housing, retail and public service needs of the campus. For the same reasons presented above for the Proposed Action, Alternative 2 would directly induce substantial population growth, resulting in a significant and unavoidable impact.

Displacement of People and Housing

The number of dwelling units that would be removed from the site would also be the same as under the Proposed Action. Since only three dwelling units would be removed, impacts related to the displacement of housing or people would also be less than significant.

Impact on Minority or Low-income Populations

Similar to the Proposed Action, this alternative would not result in a disproportionate impact on minority or low-income populations and the benefits provided to the region would be the same as under the Proposed Action.

4.12.6.3 Alternative 3 - Bellevue Ranch

Impact related to Population Growth

Under this alternative, enrollment, employment, and housing would be the same as under the Proposed Action. The University Community would serve all of the housing, retail and public service needs of the campus. For the same reasons presented above for the Proposed Action, Alternative 2 would directly induce substantial population growth, resulting in a significant and unavoidable impact.

Displacement of People and Housing

Approximately 300 dwelling units are located within the proposed boundaries of Alternative 3. In contrast, three dwelling units are located within the proposed boundaries of the Proposed Action. Therefore, Alternative 3 would involve the displacement of substantial numbers of housing and approximately 1,000 persons, resulting in a significant and unavoidable impact.

Impact on Minority or Low-income Populations

Similar to the Proposed Action, this alternative would not result in a disproportionate impact on minority or low-income populations and the benefits provided to the region would be the same as under the Proposed Action.

4.12.6.4 Alternative 4 - 2002 Proposed Project

Impact related to Population Growth

Under Alternative 4, the Campus would provide housing for 50 percent of the faculty and staff. This would reduce the demand for faculty and staff housing within the University Community. The University Community would serve all of the housing, retail and public service needs of the campus. For the same reasons presented above for the Proposed Action, Alternative 2 would directly induce substantial population growth, resulting in a significant and unavoidable impact.

Displacement of People and Housing

The number of dwelling units that would be removed from the site would also be the same as under the Proposed Action. Since only three dwelling units would be removed, impacts related to the displacement of housing or people would also be less than significant.

Impact on Minority or Low-income Populations

Similar to the Proposed Action, this alternative would not result in a disproportionate impact on minority or low-income populations and the benefits provided to the region would be the same as under the Proposed Action.

4.12.6.5 Alternative 5 - No Action

Impact related to Population Growth

Under this alternative, the remainder of the Campus and Community North would not be built. However, Community South could develop based on development plans not related to the establishment of a UC Campus in Merced. Since a full Campus would be developed under this alternative, the population growth impacts would be substantially reduced compared to the Proposed Action. Based on the substantial reduction in population, impacts related to direct population growth would be less than significant.

Displacement of People and Housing

There are three dwelling units located on the Community South site. Therefore, the number of dwelling units that would be removed from the site would also be the same as under the Proposed Action. Since only three dwelling units would be removed, impacts related to the displacement of housing or people would be less than significant.

Impact on Minority or Low-Income Populations

Because the Campus would not be developed, Alternative 5 would result in fewer economic and educational benefits to the residents of Merced City, Merced County and the greater Central Valley. Since development of Community South would most likely be primarily residential under this alternative, impacts related to environmental justice would be less than significant.

4.12.6.6 Alternative 6 - No Build

Impact related to Population Growth

Unlike Alternatives 1 through 5, the No Build Alternative would not include any development activities. Therefore, no population growth would occur.

Displacement of People and Housing

As no new development would occur under the No Build Alternative, there would be no impact related to the displacement of housing or people.

Impact on Minority or Low-income Populations

As no new development would occur under the No Build Alternative, there would be no impact to minority or low-income populations.

4.12.7 SUMMARY COMPARISON OF ALTERNATIVES

Implementation of Alternatives 1 through 5 would result in direct population growth. However, Alternatives 1 through 4 are anticipated to result in substantial population growth due to development of the Campus and University Community. Based on population projections for Merced County and the City of Merced, the impact related to the population increase would be substantial and because no mitigation is possible to reduce this population impact, the impact would be significant and unavoidable. Alternative 5, which would not develop the rest of the Campus and all of Community North but would develop Community South, would result in lower population growth. Although the exact development

plans for Community South under this alternative cannot be predicted, population impacts are anticipated to be less than significant. Alternatives 1, 2, 4, and 5 would not result in the displacement of substantial numbers of housing or people and impacts would be less than significant. However, approximately 300 dwelling units are located on the Alternative 4 site. The removal of these units would constitute a significant and unavoidable impact.

Impacts related to environmental justice would be similar under Alternatives 1, 2, 3, and 4. No minority or low-income populations would be disproportionately impacted; in fact the development of the Campus would provide economic and educational benefits to the populations of the City of Merced, Merced County, and the Central Valley. No minority or low-income populations would be disproportionately impacted under Alternatives 5 or 6. Since the Campus would not be developed under either alternative, no socioeconomic benefits to the region would occur.

4.12.8 REFERENCES

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4.13 TRANSPORTATION AND TRAFFIC

4.13.1 INTRODUCTION

This section describes the existing transportation infrastructure that serves the project site and its vicinity and potential impacts to the transportation infrastructure from the development of the UC Merced Campus and University Community. Regulations and policies affecting the transportation in the project area are also described. Information presented in this section is based on the Transportation Impact Analysis prepared for this project.

A few comments related to transportation and traffic were received in response to the Notice of Preparation and the Notice of Intent issued for this Draft Environmental Impact Statement/ Environmental Impact Report (EIS/EIR). A commenter noted that the EIS/EIR should address regional traffic impacts created by the proposed project's traffic on routes that would provide access to the campus for regionally located students, support personnel, vendors, and services, including impacts stemming from a public transit option that provides service between Merced and Tuolumne County. Another commenter stated that the EIS/EIR should include a traffic analysis to determine traffic effects in the region, such as increased traffic and congestion on the local surface streets, freeways, and highways. These comments are addressed in this section.

4.13.2 AFFECTED ENVIRONMENT

4.13.2.1 Roadway Network

The roadway network in the study area is shown in **Figure 4-13-1, Project Study Area**. This figure also shows the study intersections, and **Figure 4.13-2, Roadway Study Segments,** shows the roadway segments. The study area encompasses the roadway network extending from Bellevue Road to the north to the area of State Route 99 and Mission Avenue interchange to the south, and from Highway 59 to the west and Kibby Road to the east. Roadway facilities in downtown Merced between V Street and G Street along W 16th Street were also evaluated. The area surrounding the site of the Proposed Action (hereinafter project site) is largely undeveloped with the exception of the Phase 1.1 development on the campus and rural residences in the surrounding areas. Limited roadway infrastructure is in place. The site can be accessed by three two-lane rural roads, namely Bellevue Road, Lake Road, and Yosemite Avenue. Descriptions of the local and regional roadways in the vicinity of the Proposed Action that are relevant to the Proposed Action are provided below.

State Route 99 (hereinafter SR 99 or Highway 99 as it is locally known) is the primary regional facility in the Merced area. Highway 99 provides access to San Francisco and Sacramento to the north, and Fresno

and Bakersfield to the south. Through the City of Merced, Highway 99 is a four-lane freeway, with an average traffic volume in the range of 50,000 to 55,000 vehicles per day. Future Caltrans plans call for the improvements to Highway 99 throughout the Central Valley, including upgrading all segments to freeway standards with access limited to interchanges and widening to at least six travel lanes throughout the corridor.

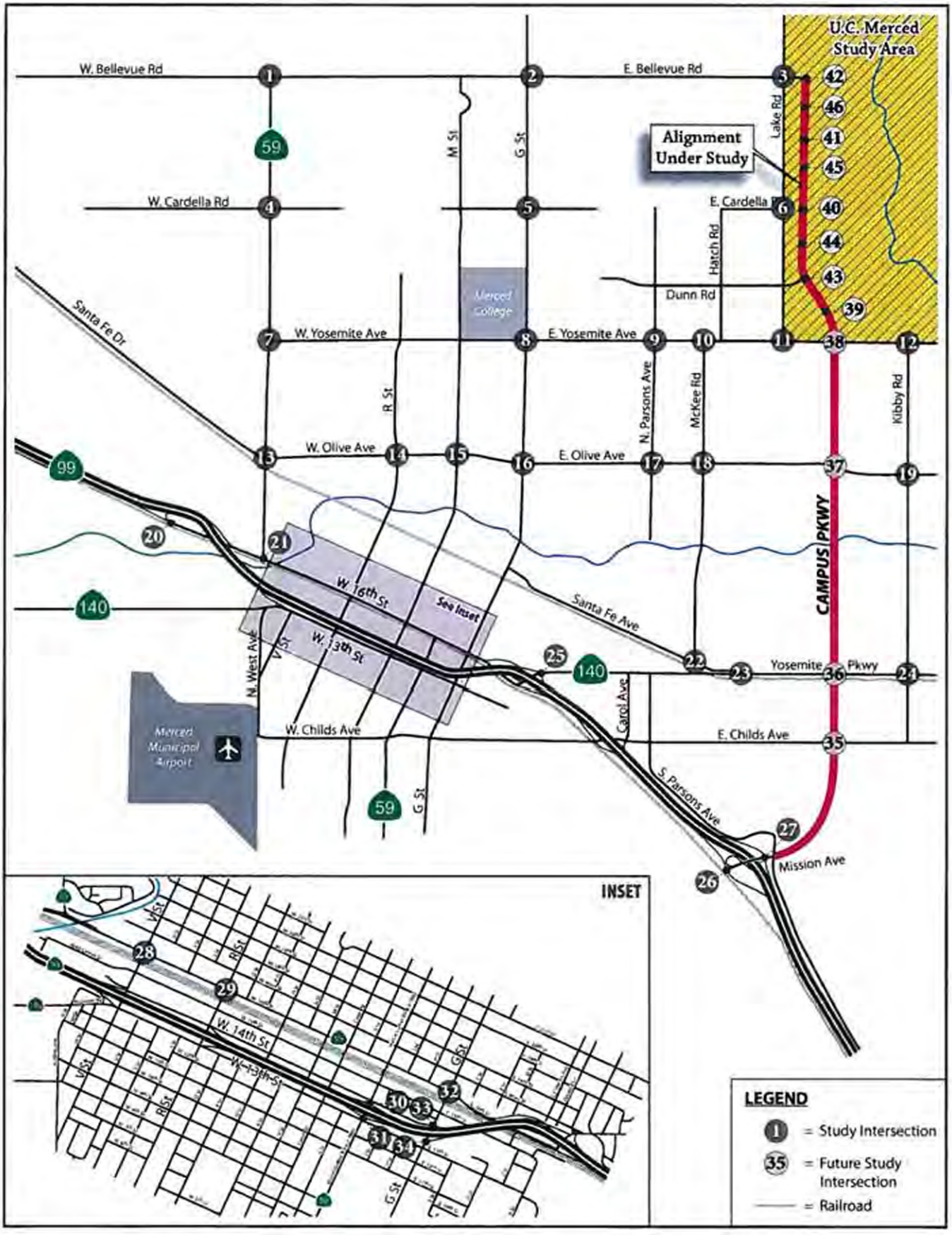
State Route 140 (hereinafter Highway 140 or Yosemite Parkway as it is locally known) is a major east-west highway serving recreational and local traffic. Highway 140 is a two-lane rural highway providing regional access to Yosemite National Park to the east, and extending to Highway 99 and Interstate 5 to the west. Average daily volumes on the highway range from about 8,000 vehicles west of Merced to 9,500 vehicles east of Merced. For a portion of its alignment through the City of Merced, Highway 140 is coterminous with Highway 99.

State Route 59 (hereinafter Highway 59 as it is locally known) is a north-south facility extending from State Route 152 (near Los Banos) to Snelling, a community located north of the City of Merced on the Merced River. Highway 59 is a two-lane rural highway through Merced, with segments carrying between 5,000 and 23,000 vehicles per day. The highway is also referred to as Snelling Highway.

G Street is a north-south roadway extending from Highway 99 to La Paloma Road, where it turns into Snelling Road. G Street is a four-lane roadway south of Yosemite Avenue and a two-lane roadway north of Yosemite Avenue. G Street carries almost 26,000 vehicles per day within the City, and 6,700 daily vehicles north of the city limits. G Street is used to designate the east-west streets within the City as an eastern road or a western road (e.g., East Bellevue Road and West Bellevue Road).

Olive Avenue is an east-west street providing cross-town travel. West Olive Avenue connects Highway 59 and R, M, and G Streets. It is a six-lane facility west of G Street, primarily serving a commercial corridor. West of Highway 59, Olive Avenue becomes Santa Fe Drive, connecting the northern portions of Merced to the City of Atwater and Castle Air Force Base. The segment of West Olive Avenue between Highway 59 and R Street is designated as an expressway. East of G Street, East Olive Avenue transitions from four lanes to two lanes and provides access to one of Merced's largest residential areas. Daily traffic volumes range from 32,250 vehicles east of Highway 59 to 18,500 vehicles east of G Street.

Bellevue Road is a two-lane east-west road extending from Fox Road to its eastern terminus at Lake Road adjacent to the project site. This roadway currently carries approximately 3,700 vehicles per day, west of Lake Road.

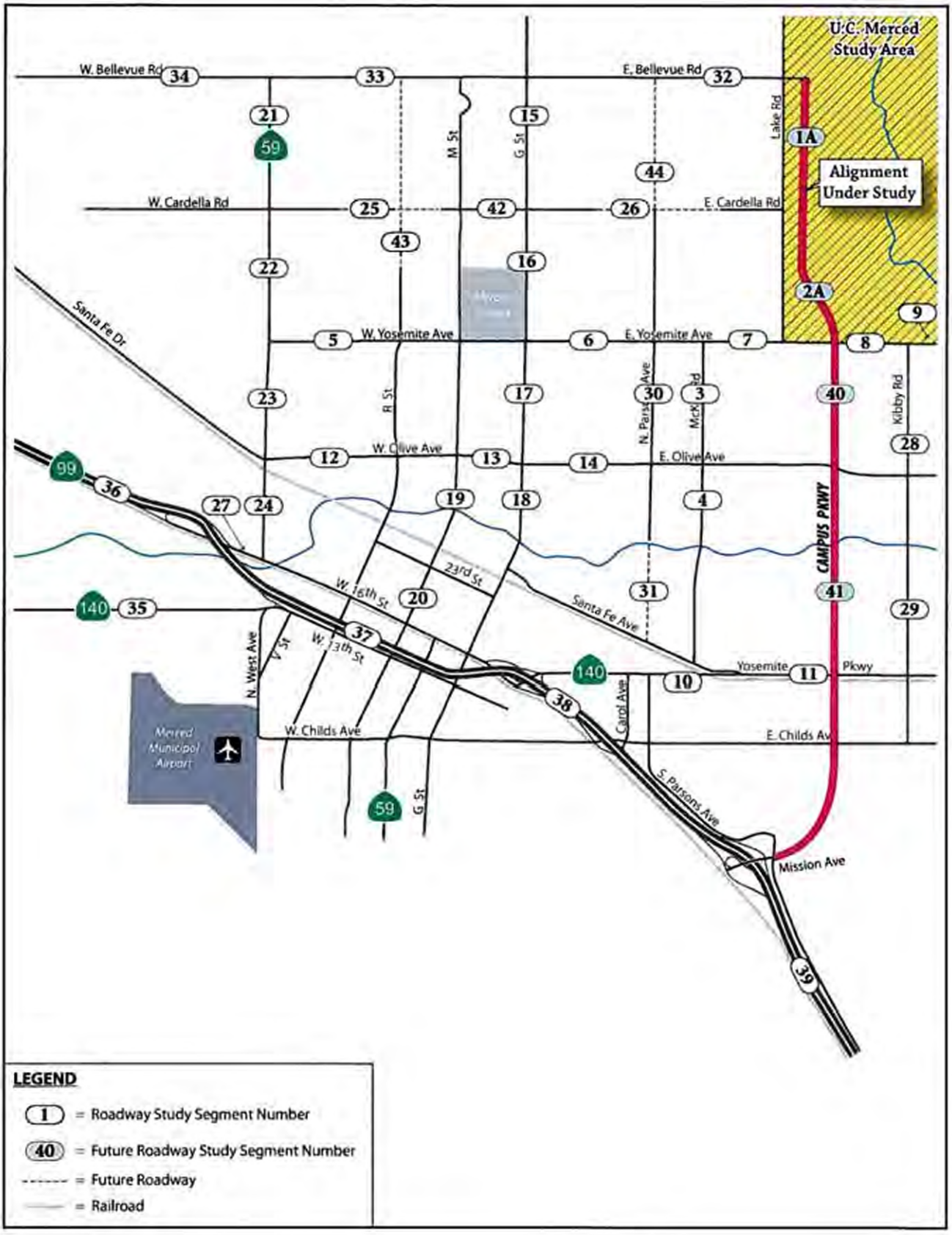


SOURCE: Fehr & Peers - October 2008

FIGURE 4.13-1

Project Study Area

974-001•10/08



NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-2**

Roadway Study Segments

Yosemite Avenue is a two-lane east-west road extending from R Street to its eastern terminus at Arboleda Drive. This roadway carries between 15,100 vehicles per day east of G Street, decreasing to 2,150 vehicles per day east of Kibby Road. Yosemite Avenue forms the southern boundary of the project site.

Lake Road is a two-lane north-south road extending from Yosemite Avenue to its northern terminus at Lake Yosemite. The road carries about 2,450 south of Bellevue Road. Lake Road forms the western boundary of the project site.

Kibby Road is a two-lane north-south road extending south from Yosemite Avenue to East Child Avenue, just south of Highway 140. The road carries about 1,250 vehicles per day south of Yosemite Avenue.

Cardella Road is a discontinuous east-west road within the City of Merced. An easterly section of Cardella Road that serves the rural residences is located west of Lake Road and has an intersection on Lake Road.

Campus Parkway is a planned north-south, divided four-lane roadway that is approved for construction between Highway 99 and Yosemite Avenue. An extension of the parkway between Yosemite Avenue and Bellevue Road is proposed as part of the Proposed Action and evaluated in this EIS/EIR as part of the future roadway network in the project study area.

4.13.2.2 Study Intersections and Roadway Segments

Intersection operations were evaluated during the weekday morning (AM) and evening (PM) peak periods. Thirty-four intersections within the study area were analyzed for both existing and future conditions, as shown in **Figure 4.13-1** and listed below:

1. Highway 59 and Bellevue Road
2. G Street and Bellevue Road
3. Lake Road and Bellevue Road
4. Highway 59 and Cardella Road
5. G Street and Cardella Road
6. Lake Road and Cardella Road
7. Highway 59 and Yosemite Avenue
8. G Street and Yosemite Avenue
9. Parsons Avenue and Yosemite Avenue
10. McKee Road and Yosemite Avenue
11. Lake Road and Yosemite Avenue
12. Kibby Road and Yosemite Avenue
13. Highway 59 and Olive Avenue
14. R Street and Olive Avenue

15. M Street and Olive Avenue
16. G Street and Olive Avenue
17. North Parsons Avenue and Olive Avenue
18. McKee Road and Olive Avenue
19. Kibby Road and Olive Avenue
20. SP Avenue and 16th Street-SR 99 SB Ramps
21. Highway 59 and West 16th Street
22. Santa Fe Avenue and McKee Road
23. Santa Fe Avenue and Yosemite Parkway
24. Kibby Road and Yosemite Parkway
25. Yosemite Parkway and SR 99 NB Ramps
26. Mission Avenue and SR 99 SB Ramps
27. Mission Avenue and SR 99 NB Ramps
28. V Street and 16th Street
29. 16th Street and R Street
30. Martin Luther King Jr. Way and SR-99 NB Ramps
31. Martin Luther King Jr. Way and SR-99 SB Ramps
32. G Street and E.16th Street
33. G Street and SR-99 NB Off-Ramp and 14th Street
34. G Street and SR-99 SB On-Ramp

The following intersections were evaluated during the weekday morning (AM) and evening (PM) peak periods in future scenarios only as these would exist only after the Campus Parkway is constructed:

35. Childs Avenue and Campus Parkway
36. Yosemite Parkway and Campus Parkway
37. Olive Avenue and Campus Parkway
38. Yosemite Avenue and Campus Parkway
39. Dunn Road and Campus Parkway
40. Cardella Road and Campus Parkway
41. Community Access Road and Campus Parkway
42. Bellevue Road and Campus Parkway

Roadway segment analyses were performed for the following roadway segments. Under the future scenarios, the analysis assumes that the Campus Parkway section between Yosemite Avenue and Bellevue Road would be constructed parallel to Lake Road, Lake Road would become a local access road, and Campus Parkway would replace its function for through access and for access to the Campus and the University Community. Therefore, Campus Parkway was analyzed in future scenarios instead of the two Lake Road segments (segments 1 and 2) listed among the study segments below.

1. Lake Road, south of Bellevue
2. Lake Road, south of Cardella
3. McKee, south of Yosemite
4. McKee, south of West Olive
5. Yosemite Avenue, east of SR 59
6. Yosemite Avenue, east of G St

7. Yosemite Avenue, west of Lake Road
8. Yosemite Avenue, east of Lake Road
9. Yosemite Avenue, east of Kibby
10. Yosemite Parkway, west of Santa Fe Avenue
11. Yosemite Parkway, east of Santa Fe Avenue
12. West Olive Avenue, east of SR 59
13. West Olive Avenue, west of G Street
14. West Olive Avenue, east of G Street
15. G Street, south of Bellevue
16. G Street, south of East Cardella
17. G Street, south of Yosemite Avenue
18. G Street, south of West Olive
19. M Street, north of 23rd
20. M Street, south of 23rd
21. SR 59, south of Bellevue
22. SR 59, south of Cardella
23. SR 59, north of East Yosemite Avenue
24. SR 59, north of West Olive
25. Cardella Road, east of SR 59
26. Cardella Road, east of G Street
27. 16th Street, west of SR 59
28. Kibby, south of Yosemite Avenue
29. Kibby, north of Yosemite Parkway
30. North Parsons, north of Olive Avenue
31. North Parsons, south of Olive Avenue
32. Bellevue, west of Lake Road
33. Bellevue, west of SR 59
34. Bellevue, east of SR 59
35. SR 140, west of Massasso
36. SR 99, north of 16th Street
37. SR 99, north of M Street
38. SR 99, south of Yosemite Parkway
39. SR 99, south of Mission Avenue
40. Campus Parkway, south of Yosemite Ave
41. Campus Parkway, south of Olive Avenue
42. W. Cardella, M Street to G Street
43. R Street, West Yosemite to Bellevue
44. N. Parsons, East Yosemite to Bellevue

4.13.2.3 Traffic Analysis Methodology

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., best operating conditions) to LOS F (worst operating conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

Different criteria and methods were used to assess operating conditions for the various types of facilities analyzed in this study, including roadway segments, and signalized and unsignalized intersections. The LOS criteria and methods for each of these facilities are described in the following sections.

Roadway Capacity Analysis

Operations of the roadway segments were evaluated by comparing roadway segment volumes to capacities. The capacity of each segment was based on the type of facility (freeway, highway, county road, arterial, or collector), number of lanes, type of traffic control at the downstream intersection, and maximum per-lane capacities from the Merced County Association of Governments (MCAG) travel demand model. Roadway segment capacities remain constant within classes for each roadway facility and do not take into consideration the added capacity of turning lanes at intersections. The daily per-lane capacities for each roadway type are presented in **Table 4.13-1, Per-Lane Roadway Segment Capacities**.

Table 4.13-1
Per-Lane Daily Roadway Segment Capacities

Type of Roadway	LOS A Threshold[1]	LOS B Threshold[1]	LOS C Threshold[1]	LOS D Threshold[1]
Freeway Mainline	14,400	18,000	20,400	24,000
Highway	12,960	16,200	18,360	21,600
Expressway	8,500	10,600	12,000	14,100
County Road	6,480	8,100	9,180	10,800
Arterial	5,400	6,750	7,650	9,000
Collector	3,600	4,500	5,100	6,000
Ramp	3,600	4,500	5,100	6,000

[1] *Vehicles per lane per day.*
Source: Fehr and Peers, October 2008

Signalized Intersections

Traffic conditions at signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board's 2000 *Highway Capacity Manual*. This operations analysis method uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 4.13-2, Signalized Intersection Level of Service Criteria**, summarizes the relationship

between average control delay per vehicle and LOS for signalized intersections. In the City of Merced, acceptable operations at signalized intersections are defined as LOS D or better. LOS C is the limit of acceptable operation for intersections in the County. Synchro, version 6.0, was used to calculate signalized intersection LOS.

Table 4.13-2
Signalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and/or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with long delays indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 80.0

Source: Highway Capacity Manual (Transportation Research Board, 2000)

Unsignalized Intersections

Traffic conditions at unsignalized intersections were evaluated using the method from Chapter 17 of the 2000 *Highway Capacity Manual*. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. This incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For all-way stop-controlled intersections, the average control delay is calculated for the intersection as a whole. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average delay of all movements in that lane. The delays for the entire intersection and for the movement or approach with the

highest delay are reported. **Table 4.13-3, Unsignalized Intersection Level of Service Criteria,** summarizes the relationship between delay and LOS for unsignalized intersections.

Table 4.13-3
Unsignalized Intersection Level of Service Criteria

Level of Service	Description of Traffic Conditions	Average Control Delay (seconds/vehicle)
A	Little or no delays	≤ 10
B	Short traffic delays	10 – 15
C	Average traffic delays	15 – 25
D	Long traffic delays	25 – 35
E	Very long traffic delays	35 – 50
F	Extreme traffic delays with intersection capacity exceeded	> 50

Source: Highway Capacity Manual (Transportation Research Board, 2000)

Roundabouts

Operational analyses were conducted to evaluate the planned roundabouts on Lake Road using the aaSIDRA roundabout LOS software. This program provides an effective tool for analyzing roundabouts with moderate to low levels of congestion (i.e., V/C ratios less than 0.85). This software is consistent with HCM methods as it uses gap acceptance parameters. Please note that the environmental factor was modified for use in this assessment to reflect American driver behavior, as recommended by the software developer. The LOS criteria for roundabout intersections is the same as for unsignalized intersections, as presented in **Table 4.13-3** above.

4.13.2.4 Existing Levels of Service

Roadway Segments

Roadway segment levels of service were calculated based on existing traffic volumes and segment capacities presented in **Table 4.13-1**. These capacities are conservative as they are based on the number of lanes on the mainline segments and do not necessarily consider added turn lanes (and their added capacity) at the intersections. The existing volumes and corresponding LOS are shown in **Table 4.13-4, Existing Roadway Segment Level of Service.**

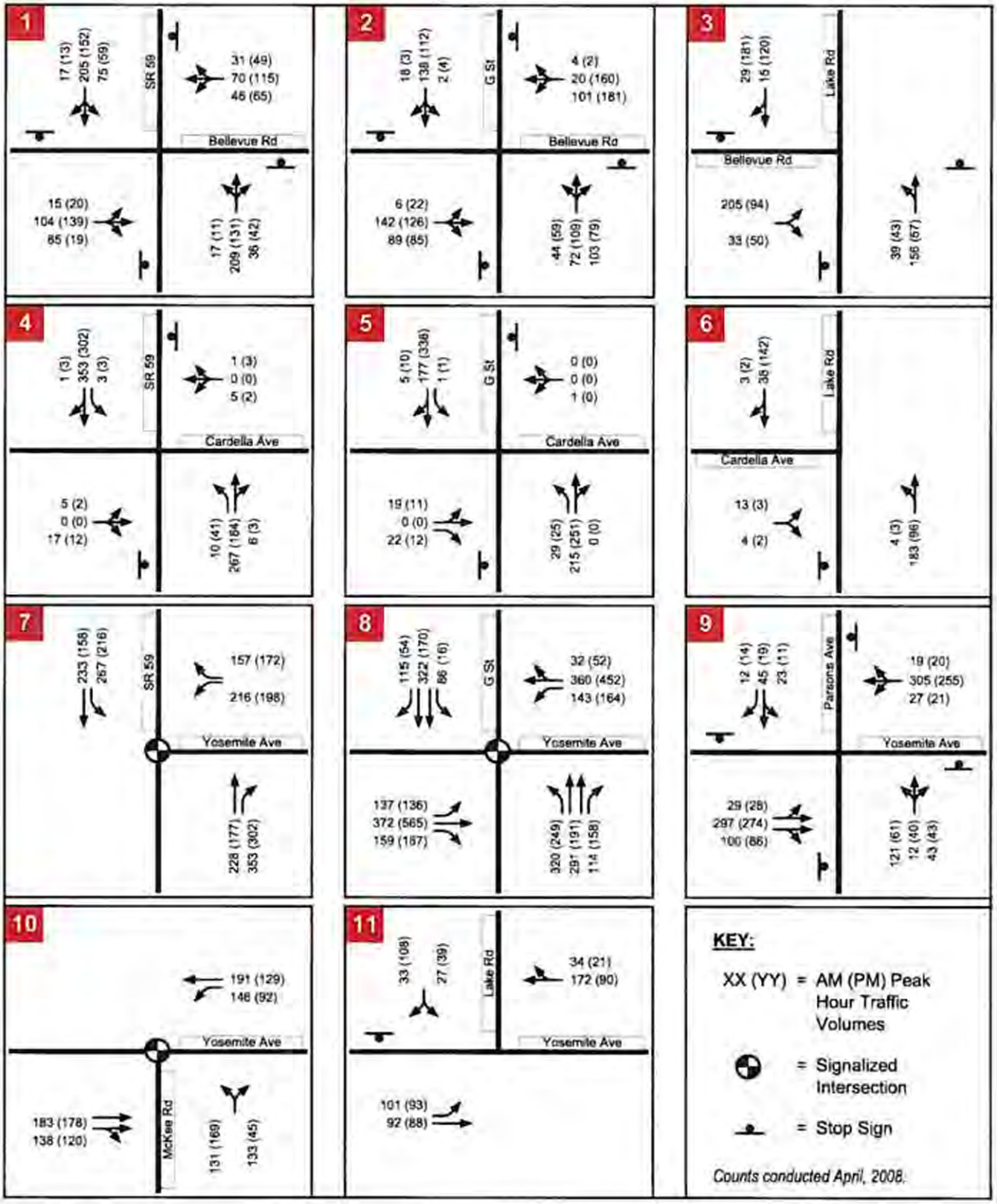
Table 4.13-4
Existing Roadway Segment Level of Service

No.	Roadway Segment	Locations	Facility Type	No. of Lanes	Capacity	LOS	ADT
1.	Lake Rd	South of Bellevue	Collector	2	12,000	A	2,450
2.	Lake Rd	South of Cardella	Collector	2	12,000	A	2,500
3.	McKee	South of Yosemite Ave	Arterial	2	18,000	A	5,250
4.	McKee	South of Olive	Arterial	2	18,000	A	8,250
5.	Yosemite Ave	East of SR 59	Arterial	4	36,000	B	12,150
6.	Yosemite Ave	East of G St	Arterial	2	18,000	C	15,100
7.	Yosemite Ave	West of Lake	Collector	2	12,000	A	4,850
8.	Yosemite Ave	East of Lake	County Road	2	21,600	A	2,450
9.	Yosemite Ave	East of Kibby	County Road	2	21,600	A	2,150
10.	Yosemite Pkwy	West of Santa Fe Ave	Arterial	2	18,000	A	10,400
11.	Yosemite Pkwy	East of Santa Fe Ave	Highway	2	43,200	A	7,550
12.	Olive Ave	East of SR 59	Arterial	6	54,000	A	32,250
13.	Olive Ave	West of G St	Arterial	6	54,000	A	26,600
14.	Olive Ave	East of G St	Arterial	4	36,000	A	18,500
15.	G St	South of Bellevue	Arterial	2	18,000	A	6,350
16.	G St	South of Cardella	Arterial	2	18,000	A	6,650
17.	G St	South of Yosemite Ave	Arterial	4	36,000	A	15,000
18.	G St	South of Olive	Arterial	4	36,000	B	25,950
19.	M St	North of 23rd	Arterial	4	36,000	A	18,350
20.	M St	South of 23rd	Arterial	4	36,000	A	17,500
21.	SR 59	South of Bellevue	Arterial	2	18,000	A	6,000
22.	SR 59	South of Cardella	Arterial	2	18,000	A	8,100
23.	SR 59	South of Yosemite Ave	Arterial	2	18,000	B	12,750
24.	SR 59	South of Olive	Arterial	2	18,000	D	16,600
25.	Cardella Avenue	East of SR 59	Collector	4	24,000	A	250
26.	Cardella Avenue	East of G St	Collector	4	24,000	A	100
27.	16th St	West of SR 59	Arterial	4	36,000	A	20,400
28.	Kibby	South of Yosemite Ave	County Road	2	21,600	A	1,250
29.	Kibby	North of Yosemite Pkwy	County Road	2	21,600	A	1,950
30.	Parsons	North of Olive	Collector	2	12,000	A	5,600
31.	Parsons	South of Olive	Collector	2	12,000	A	3,900
32.	Bellevue	West of Lake	Collector	2	12,000	A	3,700
33.	Bellevue	East of SR-59	Collector	2	12,000	A	1,800
34.	Bellevue	West of SR 59	Collector	2	12,000	A	2,650
35.	SR-140	West of Massasso	Collector	2	12,000	A	4,850
36.	SR 99	North of 16th St	Freeway	4	96,000	A	56,000
37.	SR 99	North of M St	Freeway	4	96,000	A	52,000
38.	SR 99	South of Yosemite Pkwy	Freeway	4	96,000	A	41,500
39.	SR 99	South of Mission Ave	Freeway	4	96,000	A	40,000
40.	Campus Parkway	South of Yosemite Ave	Does not Exist				
41.	Campus Parkway	South of Olive Ave	Does not Exist				
42.[1]	Cardella	M Street to G Street	Collector	2	12,000	A	3,150

No.	Roadway Segment	Locations	Facility Type	No. of Lanes	Capacity	LOS	ADT
43.	R Street	Yosemite Ave to Bellevue Ave	Does not Exist				
44.	N. Parsons	Yosemite to Bellevue	Does not Exist				

Source: Fehr & Peers, October 2008
Notes:
[1] *Segment 42: existing ADT volume estimated.*

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were conducted at the study intersections on clear days with area schools in normal session in April 2007 and April 2008. The existing traffic counts are provided in **Appendix 4.13**. For each intersection, the single hour with the highest traffic volumes during the two count periods was identified. The peak hour volumes, intersection lane configuration, and control type are presented in **Figure 4.13-3, Intersection Geometry and Volumes Existing Conditions (Intersections 1-11), Figure 4.13-4, Intersection Geometry and Volumes Existing Conditions (Intersections 12-22),** and **Figure 4.13-5, Intersection Geometry and Volumes Existing Conditions (Intersections 23-34)**.

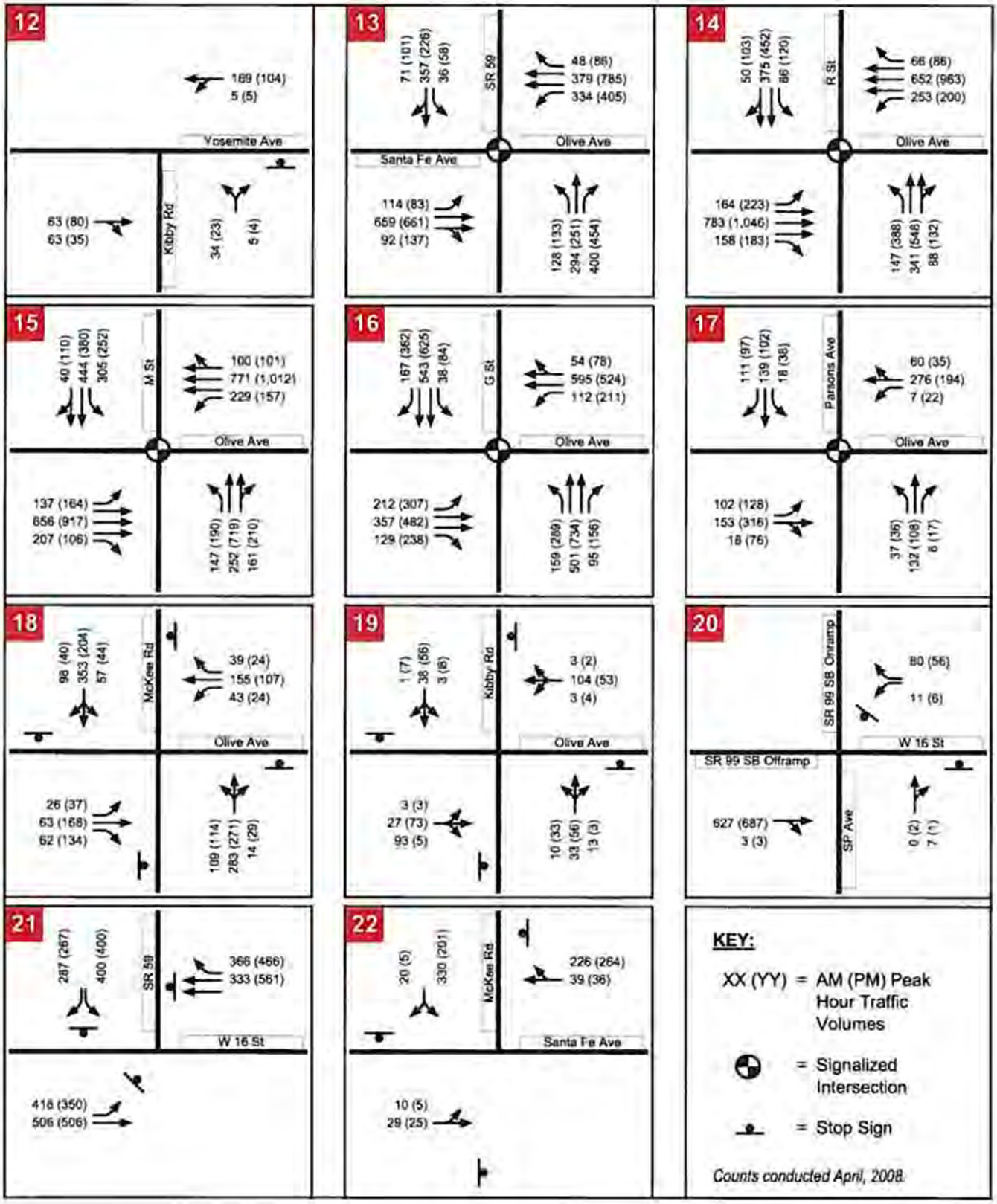


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-3**

Intersection Geometry and Volumes - Existing Conditions (Intersections 1-11)



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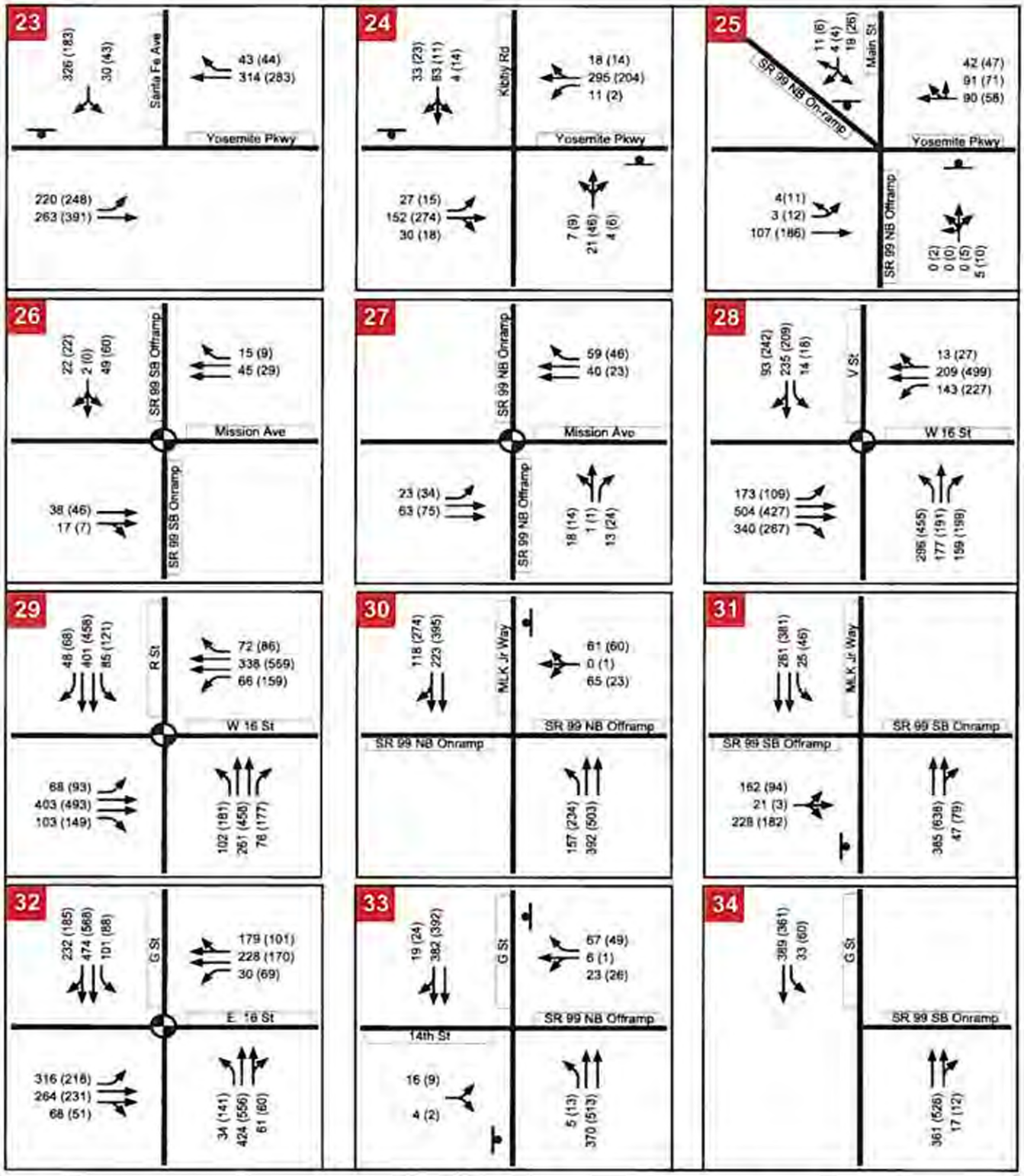
SOURCE: Fehr & Peers - October 2008

FIGURE 4.13-4

Intersection Geometry and Volumes - Existing Conditions (Intersections 12-22)



NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE 4.13-5

Intersection Geometry and Volumes - Existing Conditions (Intersections 23-34)

Intersection Levels of Service

Existing operations were evaluated for the weekday AM and PM peak hours at the existing study intersections. **Figures 4.13-3** to **4.13-5** show the intersection control type, lane geometry, and peak hour volumes for the study intersections. The existing traffic volumes were used with the existing lane configurations and signal phasing/timing as inputs into the LOS calculations. **Table 4.13-5, Existing Intersection Levels of Service**, summarizes the results. Detailed intersection LOS calculation worksheets are presented in **Appendix 4.13**.

Table 4.13-5
Existing Intersection Levels of Service

Intersection	Traffic Control	Peak Hour	Delay[3] (Seconds)	LOS[3]
1. SR 59/Bellevue	AWS	AM PM	13.2 11.0	B B
2. Parsons/Yosemite Avenue	AWS	AM PM	10.2 14.0	B B
3. Lake/Bellevue	AWS	AM PM	9.7 9.4	A A
4. SR 59/Cardella	SSSC	AM PM	14.8 (WB) 11.4 (WB)	B B
5. G St/Cardella	SSSC	AM PM	13.3 (WB) 15.6 (EB)	B C
6. Lake/Cardella	SSSC	AM PM	9.8 (EB) 9.7 (EB)	A A
7. SR 59/Yosemite Avenue	Signal	AM PM	13.5 12.0	B B
8. G St/Yosemite Avenue	**Signal**	**AM** PM	**57.5** 42.1	**E** D
9. Parsons/Yosemite Avenue	AWS	AM PM	16.4 11.4	C B
10. McKee/Yosemite Avenue	Signal	AM PM	14.8 11.6	B B
11. Lake/Yosemite Avenue	SSSC	AM PM	11.6 (SB) 11.0 (SB)	B B
12. Kibby/Yosemite Avenue	SSSC	AM PM	10.5 (NB) 9.8 (NB)	B A
13. SR 59/Olive	Signal	AM PM	51.3 47.4	D D

Intersection	Traffic Control	Peak Hour	Delay[3] (Seconds)	LOS[3]
14. R St/Olive	Signal	AM PM	39.2 54.8	D D
15. M St/Olive	**Signal**	**AM** **PM**	**56.9** **60.5**	**E** **E**
16. G St/Olive	**Signal**	AM **PM**	47.4 **56.0**	D **E**
17. Parsons/Olive	Signal	AM PM	23.1 21.3	C C
18. McKee/Olive	AWS	AM PM	11.2 8.0	C B
19. Kibby/Olive	AWS	AM PM	8.0 7.9	A A
20. SP Ave/16th St/SR 99 SB Ramps	SSSC	AM PM	14.7 (SB) 15.6 (SB)	B C
21. SR 59/16th St	AWS	AM PM	16.4 17.9	C C
22. Santa Fe/McKee	AWS	AM PM	13.7 9.5	B A
23. Santa Fe/Yosemite Parkway[4]	**SSSC**	**AM** PM	**34.7 (SB)** 21.4 (SB)	**D** C
24. Lake/Bellevue	SSSC	AM PM	15.0 (SB) 14.3 (NB)	B B
25. Yosemite Parkway/SR 99 NB Ramps	SSSC	AM PM	4.2 (SB) 4.5 (SB)	A A
26. Mission Ave/SR 99 SB Ramps	Signal	AM PM	5.2 4.8	A A
27. Mission Ave/SR 99 NB Ramps	Signal	AM PM	6.0 6.0	A A
28. V St/16th St	**Signal**	**AM** **PM**	**59.4** **65.3**	**E** **E**
29. 16th St/R St	Signal	AM PM	28.8 44.2	C D
30. Martin Luther King Jr. Way/SR 99 NB Ramps	SSSC	AM PM	21.5 (WB) 29.7 (WB)	C D
31. Kibby/Yosemite Parkway	SSSC	AM PM	25.9 (EB) 26.9 (EB)	D D
32. Martin Luther King Jr. Way/SR99 SB Ramps	Signal	AM PM	45.9 51.8	D D

Intersection	Traffic Control	Peak Hour	Delay[3] (Seconds)	LOS[3]
33. G St/SR-99 NB Off-Ramp/14th St	SSSC	AM PM	16.0 (WB) 19.2 (EB)	C C
34. G St/SR-99 SB On-Ramp	SSSC	AM PM	8.2 (SB) 8.7 (SB)	A A

[1] *Traffic signals or stop signs.*
[2] *For side-street stop-controlled intersections, delays for worst movement are shown.*
[3] *Intersections operating at unacceptable levels (LOS E or LOS F for city of Merced, LOS D, LOS E or LOS F for county of Merced) are shown in* ***bold****.*
[4] *Intersection located in Merced County.*
Source: Fehr & Peers, October 2008.

Two delay values are reported for each unsignalized intersection: (1) the highest controlled movement delay, and (2) the intersection average delay. LOS D is the limit of acceptable operations in the City of Merced. LOS C is the limit of acceptable operation for intersections in the County. Field observations and the level of service results indicate that at this time, most intersections operate acceptably during the weekday AM and PM peak hours, with a few exceptions.

During the AM peak hour, the following intersections operate at an overall LOS E or F:

- G Street/Yosemite Avenue (LOS E)
- M Street/ Olive Avenue (LOS E)
- Santa Fe /Yosemite Parkway (LOS D)[1]
- V Street/16th Street (LOS E)

During the PM peak hour, the following intersections operate at an overall LOS E or F:

- M Street/Olive Avenue (LOS E)
- G Street/Olive Avenue (LOS E)
- V Street/16th Street (LOS E)

Traffic Signal Warrants

To assess the need for signalization of stop-controlled intersections, the *Manual of Uniform Traffic Control* Federal Highway Administration 2000 presents eight signal warrants. The Peak Hour Volume Warrant (Warrant 3) is used in this study as a supplemental analysis tool to assess operations at unsignalized

1 Intersection located in the County of Merced where the limit of acceptable LOS is C.

intersections.[2] Detailed signal warrant calculations are provided in **Appendix 4.13**. The results of the traffic signal warrant analysis indicate that the peak hour volume traffic signal warrant is currently satisfied at the following unsignalized intersections:

- SR 59/Bellevue (AM)
- G Street/Bellevue (PM)
- SR 59/16th Street (AM, PM)
- Santa Fe/Yosemite Parkway/SR 140 (AM, PM)
- Yosemite Parkway/SR 99 Southbound Off-Ramp (PM)

4.13.2.5 Transit Service

The project site is accessible by transit both locally and regionally.

Amtrak provides service to Merced on the *San Joaquins* line with six trains per day operating in each direction. This service connects Merced with the San Francisco Bay Area, Fresno, Bakersfield, and other cities in the Central Valley. Connections are also available to southern California, including San Diego, Oceanside, Santa Ana, and Los Angeles.

The Bus provides transit service for Merced County. The Bus operates 21 routes (16 of which serve Merced) Monday to Friday, 5 of which are dial-a-ride on-demand service. On Saturday, The Bus operates 15 routes (12 of which serve Merced), one of which provides on-demand service. In September 2008, a Bus route serving the campus began service.

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[2] Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the Manual of Uniform Traffic Control (MUTCD), Federal Highway Administration 2000 and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible state or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

CatTracks is funded by the University. It connects UC Merced Phase 1 Campus and surrounding areas, including downtown Merced and research facilities located on the former Castle Air Force base. The following routes are provided when classes are in regular session:

- Route A-B connects the campus and Castle research facilities. Two AM round trips (60-minute headway), one mid-day round-trip, and two PM round trips (75-minute headway) are provided. A one-way trip takes 30 minutes. Service operates Monday to Friday;

- Route C connects the campus with Merced College, retail locations along Yosemite Avenue and Loughborough Drive, and housing in multiple locations. Service is provided between 7:00 AM and 6:20 PM Monday to Friday with 65-minute headways and a round-trip takes 65 minutes. An extra round-trip is provided in the AM peak on Tuesdays and Thursdays, with service starting at 5:55 AM.

- Route E connects the campus with Merced College, Amtrak, retail, and entertainment locations in downtown and along Yosemite and Olive Avenues in the city of Merced, and various housing complexes. The route operates in a one-directional loop. On weekdays, service is provided between 6:20 PM and 10:25 PM with three trips on 75-minute headways. On weekends, service is provided between 11 AM and 10 PM, also on 75-minute headways.

- NiteCat connects the campus with retail and entertainment establishments throughout the city of Merced, including downtown. The route operates in a one-directional loop. Service is provided on Friday and Saturday evenings between 10 PM and 2 AM the following morning. Hourly headways are observed and a round trip takes 60 minutes.

During the summer session, a modified version of Route C operates on weekdays. Shuttles operate between 7:00 AM and 9:45 AM, between 10:45 AM and 12:34 PM and between 3:00 PM and 7:49 PM on 65-minute headways.

StaRT (Stanislaus Regional Transit) provides one round trip (southbound in the AM and northbound in the PM) between Modesto, Turlock, and Merced along SR 99. It connects with The Bus in Merced.

YARTS (Yosemite Area Regional Transportation System) connects the city of Merced to Yosemite National Park. In the summer, six trips (five in the AM, one in the PM) are provided in the eastbound direction between Merced and Yosemite National Park. In the westbound direction, one AM trip is provided between Mariposa/Midpines and Merced, one AM trip is provided between the Park and Merced, and six PM trips are provided between the Park and Merced.

In the fall and winter, three AM and one PM eastbound runs are provided, connecting Merced and Yosemite. In the westbound direction, two AM runs are provided, one connecting Mariposa/Midpines, and Merced, and one connecting the Park and Merced. In the PM, four runs, connecting the Park and Merced are provided. **Figure 4.13-6, Transit Routes,** shows transit routes serving the campus.

4.13.2.6 Pedestrian and Bicycle Facilities

Pedestrian facilities include sidewalks, crosswalks, and pedestrian signals. Sidewalks are generally provided in developed areas in Merced and are being added in undeveloped areas as the adjacent parcels develop, although sidewalk facilities are limited on the regional roadways that provide access to the site. Crosswalks and pedestrian signals are provided at the signalized study intersections in the area. Bicycle facilities include the following:

- Bike paths (Class I) – Paved trails that are separated from roadways.
- Bike lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs.
- Bike routes (Class III) – Designated roadways for bicycle use by signs only; may or may not include additional pavement width for cyclists.

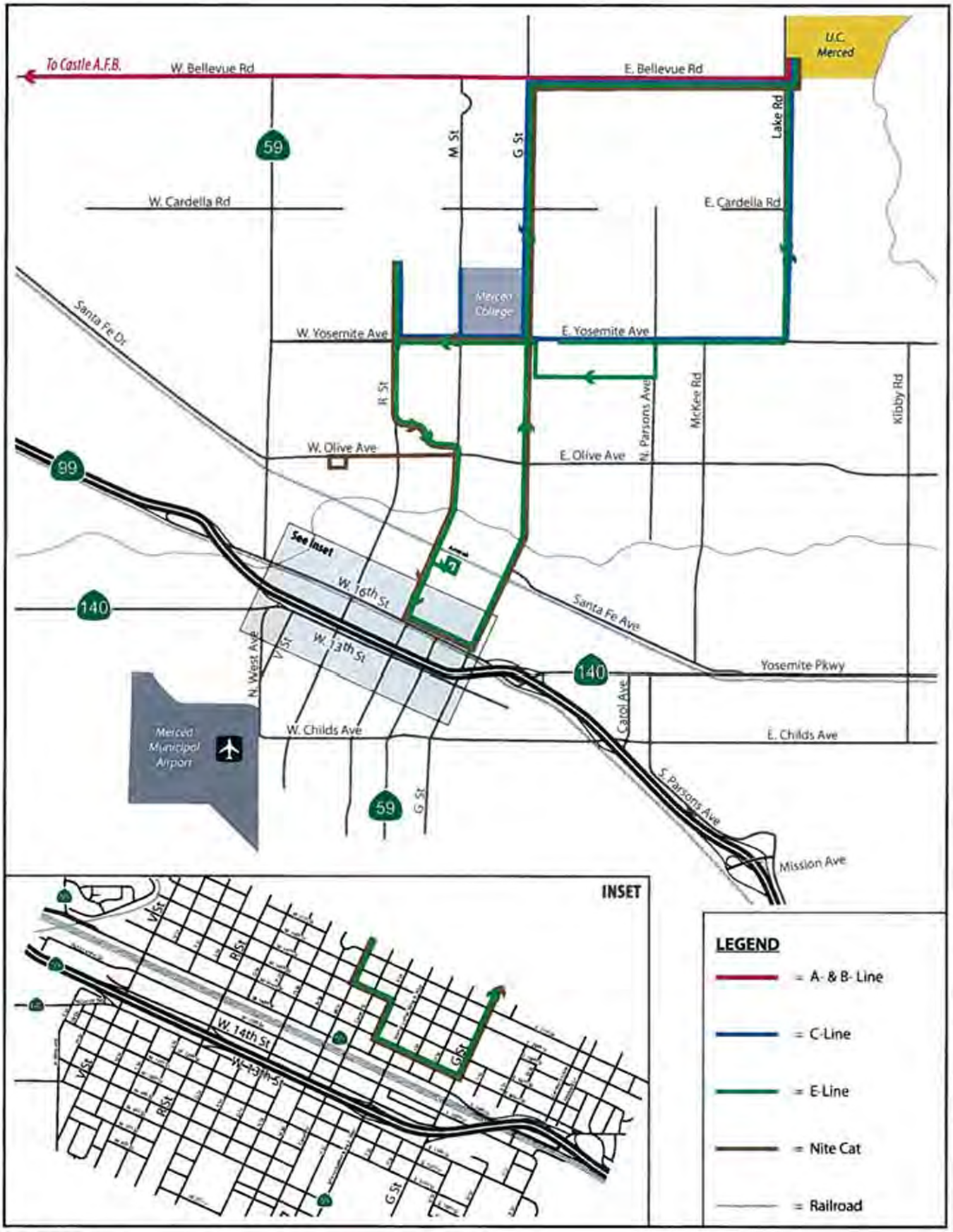
Figure 4.13-7, Existing Bikeways, shows the existing bicycle facilities in Merced.

A north-south Class I bike path is provided along Lake Road, and east-west paths are provided along Bear Creek and from SR 59 to McKee Road, traversing residential areas between Olive and Yosemite Avenues. Class II and Class III bike lanes are provided along parts of 14th, 18th, 21st, and 28th Streets, Bellevue Road, Childs Avenue, G Street, M Street, R Street, V Street, and Yosemite Avenue. Many of the Class II facilities were observed to be deficient in the width of the bicycle lane. These should either be re-classified as Class III lanes, or improved and brought to Class II standards.

4.13.3 APPLICABLE LAWS AND REGULATIONS

This section summarizes the planning and policy documents that relate to the provision of transportation services in Merced County. These documents include a number of planned improvements that could benefit the project. Some of the key documents include:

- 2007 Regional Transportation Plan, Merced County Association of Governments
- Merced County Year 2000 General Plan, Merced County
- Merced Vision 2015 General Plan, City of Merced
- Merced County Regional Commuter Bicycle Plan, Merced County Association of Governments, 2003

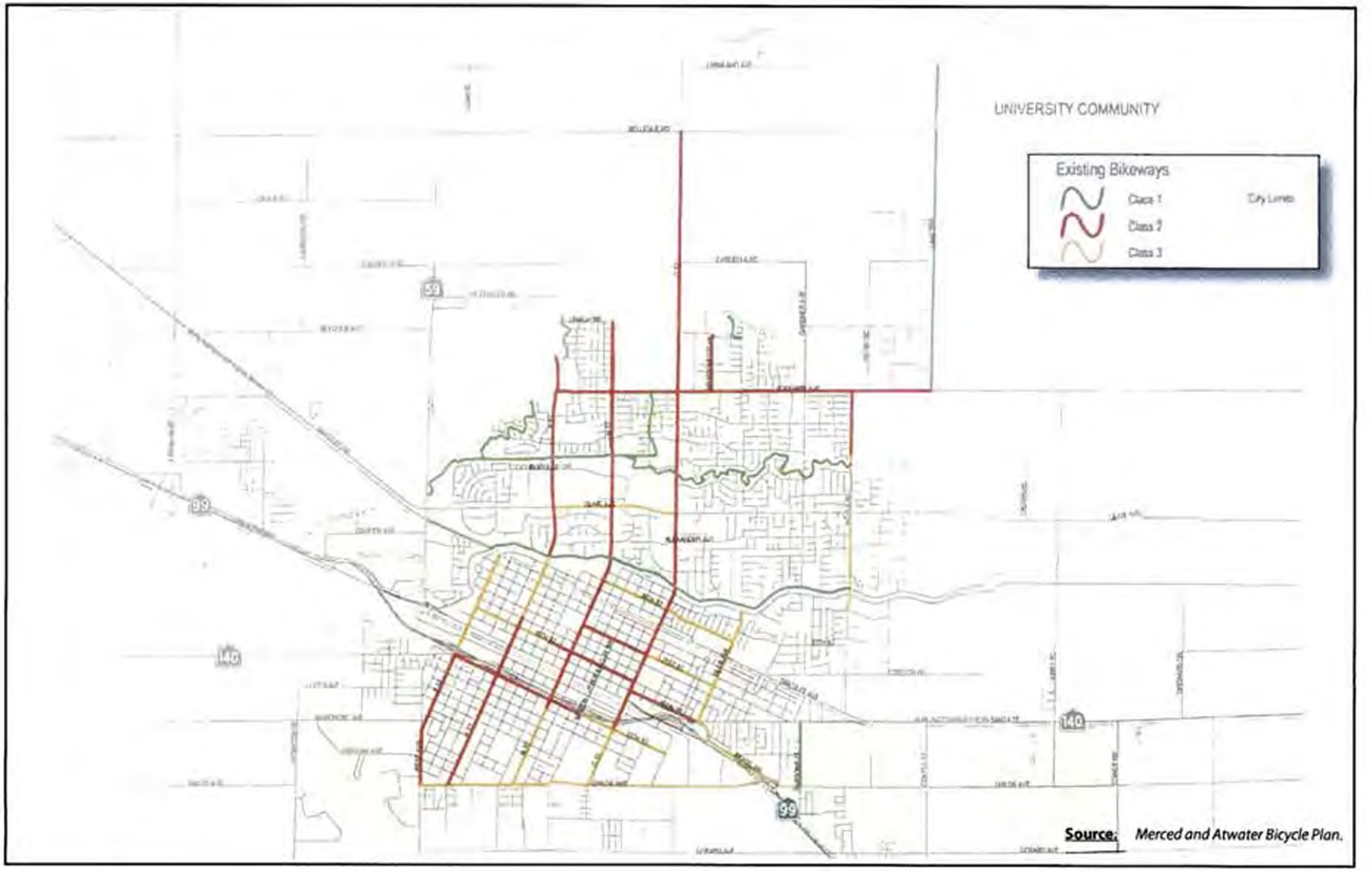


SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-6**

Transit Routes

974-001•10/08



NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-7**

Existing Bikeways

974-001-10/08

- Merced and Atwater Bicycle Plan, Merced County Association of Governments, 2003
- Short Range Transit Plan, Merced County Association of Governments, 2003
- Atwater General Plan, City of Atwater, 2001
- 2009 UC Merced Long Range Development Plan Circulation Element
- 2004 University Community Plan

4.13.3.1 2007 Regional Transportation Plan

The 2007 Regional Transportation Plan (RTP) provides a comprehensive long-range view of transportation issues, opportunities, and needs for Merced County. It establishes the goals, objectives, and policies for future transportation improvements. The plan identifies the actions that should be taken and the funding needs and options available for successful implementation. For a description of the transportation improvement projects contained in the RTP and the ways in which those projects were incorporated in this analysis, please see **Subsection 4.13.6, Environmental Consequences of Proposed Action and Alternatives** below. Some of the relevant policies contained in the 2007 RTP include:

1. Highways, Streets, and Roads

Goal: A safe and efficient regional road system that accommodates the demand for the movement of people and goods.

Objective 1.1 Maintain a Level of Service D on all regionally significant roads

Objective 1.2 Identify and prioritize improvements to the regional road system.

Objective 1.3 Use the existing street and road system in the most efficient possible manner to improve local circulation.

Objective 1.4 Monitor the impact of development on the regional road system.

2. Transit

Goal: Provide an efficient, effective, coordinated regional transit system that increases mobility for urban and rural populations, including transportation disadvantaged persons.

Objective 2.1 Meet all transit needs that are "reasonable to meet"

Objective 2.2 Increase transit ridership at a rate that exceeds annual population growth rate.

Objective 2.2.3 Plan for transit expansion with arrival of UC Merced.

Objective 2.3 Promote citizen participation and education in transit planning.

6. Non-Motorized

Goal: A regional transportation system for bicyclists and pedestrians.

Objective 6.1 Develop and construct bike and walkway facilities in urban areas and other communities where non-motorized systems do not currently exist.

4.13.3.2 Merced County General Plan

The Merced County General Plan Circulation Element, 2000, includes policies to ensure that adequate access is provided and maintained for all county land uses. The following presents the General Plan Circulation Element policies relevant to transportation systems near the proposed campus.

Goal 1: A road system which provides free movement of vehicles throughout the County.

Objective 1A: All roads are appropriately classified by their existing and future use characteristics to effectively distribute vehicles.

Policy 1: Establish a roadway system consisting of local roads, collector roads, arterial roads, and freeways, adequate to serve existing and future land uses.

Objective 1B: Roadways are improved and maintained to provide an adequate level of service "C" for existing and anticipated traffic volumes.

Policy 2: Right-of-way dedication and roadway improvements shall be pursued with the review of land use entitlements to offset circulation impacts.

Policy 3: All methods to achieve cost effective design, construction, and maintenance of existing and future roadways shall be pursued.

Policy 5: Road right-of-ways and improvements shall be coordinated with incorporated cities and with adjacent counties to ensure compatibility.

Objective 1C: Appropriate levels of roadway access are provided to all existing and future land uses.

Policy 6: In urban areas and in Planned Agricultural Industrial Development areas, newly created lots or parcels shall front upon an improved public road. Exceptions to this policy may be permitted for Planned Unit Developments (PUD).

Goal 2: A circulation system which provides for a variety of transportation modes for the safe and efficient movement of people and goods throughout the County.

Objective 2A: Rail and air transportation systems which provide safe, efficient, and reliable movement of passengers and freight.

Policy 3: Encourage coordination of air and rail passenger services with other public transportation.

Objective 2B: An established bikeway system meeting the existing and future needs.

Policy 6: Encourage the construction of Class I, II or III bike routes as designated in the overall Merced County Bikeway Plan and in Community Specific Plans.

Policy 7: The location and construction of bikeways shall be coordinated with incorporated cities and adjacent counties.

Objective 2C: A public transit system adequate to meet existing and future population needs through the year 2000.

Policy 8: Support efforts by the Merced County Association of Governments (MCAG) and other public entities to improve public transportation.

Policy 9: Encourage and develop programs which promote the use of ridesharing, car-pooling and van-pooling.

A General Plan update is currently being prepared by the County, with a projected final adoption date of August 2009.

4.13.3.4 Merced Vision 2015 General Plan

The City's General Plan acknowledges the need to provide connections between the City and the future Campus and University Community. Access to the campus is identified in the General Plan as an issue requiring further study within joint City/County planning efforts. Some of the relevant policies contained in the Merced Vision 2015 General Plan include:

- Coordinate circulation and transportation planning with pertinent regional, state, and federal agencies.
- Minimize adverse impacts on the environment from existing and proposed road systems.
- Provide for and maintain a major transitway along M Street and possibly Bellevue Road.
- Support a safe and effective public transit system.
- Provide convenient bicycle support facilities to encourage bicycle use.
- Maintain and expand the community's existing bicycle circulation system.

A General Plan update for the City of Merced is currently underway.

4.13.3.5 Merced County Regional Commuter Bicycle Plan

The Merced County Regional Commuter Bicycle Plan, prepared by MCAG in June 2003, is intended to improve and enhance bicycle transportation in Merced County. Relevant goals from the plan include:

Goal 1 – Bicycle Safety: Provide a safe bicycle system as an alternative to vehicular travel. Establish and maintain routes that are designed to ensure safety. Establish a system that is secure for riders.

Objectives: Build and maintain street surfaces to avoid pavement conditions unsafe to bicyclists. As collision events and bicycle injuries/accidents are recorded, forward information to the Traffic Committee for the purpose of identification of possible remedial design actions.

Goal 2 – Bicycle Education: Encourage bicycling through education. Provide literature and up-to-date bikeway maps for the public. Promote safe bicycle use to bike riders and car drivers.

Objectives: Promote safe bicycle use to riders as well as car drivers. Cooperate with other agencies and groups to promote and educate the public regarding bicycle facilities in the plan area. Establish helmet programs that educate and encourage safe bicycle use. Support bicycle safety awareness through public information and education programs.

Goal 3 – Connectivity/Accessibility: Accommodate bicycling as part of the County's multi-modal transportation system. Establish and maintain an integrated network of bicycle facilities to support the market for which it is intended. Establish and maintain an integrated network that connects to other countries.

Objectives: Establish right-of-way requirements that accommodate the complete bikeway system, including sidewalks and multi-use paths throughout Merced County. Maintain a bicycle planning committee to oversee bicycle transportation planning and implementation projects for the purposeful movement of people and goods by the most efficient means available. Plan in coordination with the development of UC Merced. Promote bicycle routes to regional recreational and commuter destinations. Link trip origins and destinations with on-street bikeways designed to serve transportation and recreation purposes. Integrate bicycling into the transit system with bus mounted bicycle carriers. Establish nodes of connectivity to encourage tourism and commuting. Devise lane specifications for specific bicycle rider classifications. Include funding for regular facility expansion, maintenance, and repair, as well as funding to review development and zoning proposals for impact on bicycle mobility in the annual local operations and maintenance budgets. Maintain a local capital improvement plan that provides regular funding for the bicycle program to acquire right of way, to construct new facilities, to retrofit inadequate facilities and to refurbish older facilities.

4.13.3.6 Merced and Atwater Bicycle Plan

The Merced and Atwater Bicycle Plan, prepared by MCAG in November 2003, is intended to improve and enhance bicycle connections between Merced and Atwater, including connections to the campus.

4.13.3.7 Short Range Transit Plan

The Short Range Transit Plan, prepared by MCAG in September 2004, has the following purposes: evaluate current transit services; update system goals, objectives, and performance standards; describe future transit needs; and present a service plan and financial plan. The goals and objectives contained in the Plan are listed below.

Goal 1: Provide increased mobility in Merced County.

- **Objective 1a:** Provide quality and efficient transit service throughout Merced County with The Bus – Merced County Transit.
- **Objective 1b:** Coordinate the fixed route system with regional service.
- **Objective 1c:** Ensure Dial-A-Ride service meets the special needs of the disabled, seniors, ADA eligible and those not served by fixed route service.
- **Objective 1d:** Meet all transit needs that are reasonable to meet within the adopted definition of reasonableness, as set by the MCAG Governing Board.

Goal 2: Provide effective service.

- **Objective 2a:** Provide convenient transit service
- **Objective 2b**: Provide reliable transit service
- **Objective 2c:** Provide safe transit service
- **Objective 2d**: Increase service based on market demand
- **Objective 2e:** Promote transit use as an alternative mode.

Goal 3: Provide efficient service.

- **Objective 3a:** Minimize operating costs.
- **Objective 3b**: Minimize capital costs for vehicle replacement.
- **Objective 3c:** Maximize use of state and federal funds.
- **Objective 3d**: Provide productive service.

Objective 3e: Minimize subsidy per passenger trip.

4.13.3.8 Atwater General Plan

The Atwater General Plan, adopted in July of 2000, establishes the following goals and policies relevant to regional transportation systems:

Goal Circ-3: Support efforts to improve vehicular connections between Atwater and the UC Merced access system.

Policy 3.1: Support efforts to obtain funding for the projects proposed in the MIS [the State Route 99 Merced/Atwater Corridor Major Investment Study] and any subsequent documents approved on a regional basis (The projects proposed in the MIS are incorporated in the project list of the 1998 RTP).

Policy 3.2: Explore improvements to other roadways connecting the City with UC Merced.

4.13.3.9 UC Merced 2009 Long Range Development Plan Circulation Element

The UC Merced 2009 Long Range Development Plan (LRDP) mobility element includes policies and planning concepts related to streets and traffic-ways, parking locations and programs, transit routes and services, bicycle and pedestrian systems, service and delivery routes, and the primary elements of a transportation demand management plan to encourage non-automobile modes. The overarching goal of the mobility element is to ensure that the campus transportation system allows safe and efficient travel by the full variety of modes listed above and promotes the use of alternatives to the automobile. To that end, a primary element of the campus circulation plan is diversity: the accommodation of multiple modes. This can be accomplished directly through policies specifying modal priorities, and indirectly by providing the flexibility to adapt to changing conditions. The mobility policies of the UC Merced 2009 Long Range Development Plan are listed below.

Multi-Modal System

MOB-1: Ensure that the transportation infrastructure will adequately serve campus circulation needs, and provide appropriate connectivity to adjacent areas while minimizing impacts to those areas.

MOB-2: Accommodate multiple modes, including walking, cycling, and public transit, as well as driving.

MOB-3: Develop individual but coordinated master plans to guide design and implementation of the principal circulation infrastructure, including plans that address streets, bikeways, pedestrian ways, transit, and parking.

MOB-4: Reserve adequate rights-of-way to implement the designated circulation systems and designate access management restrictions.

MOB-5: Promote the development of the principal circulation system through the deployment of linear parking lots coordinated with implementation of the land use element. With campus maturity, the linear lots can be converted to campus roadways.

Pedestrian and Bicycle Circulation

MOB-6: Create a comprehensive, interconnected bicycle and pedestrian circulation system that provides access to major campus destinations. The design of the bicycle and pedestrian system should be consistent with the following principles:

- Design all campus vehicular streets (transit, service, and general traffic) as bike friendly streets, with calmed traffic speeds, adequate bike lanes, no parking or parallel parking only, and roundabouts rather than stop signs at intersections.
- Minimize bike paths separate from and paralleling roadways, unless they can be de-signed in a manner that offers significant safety or direct access advantages over streets with integral bike lanes.
- Separate pedestrians from cyclists, either in different corridors (or block grids) or, when using the same corridor, on a bikeway with a parallel but separate walkway.
- Minimize the number of pedestrian/bicycle crossing points. Where bicycle and pedestrian paths cross, emphasize proven safe and efficient design treatments such as roundabouts and pedestrian refuges. Design bike paths and lanes for moderate but safe speeds at pedestrian and vehicular crossing (8 to 10 mph).
- In the densest areas of the campus core, design the bike grid to be at least two square blocks in scale, to avoid having each building surrounded by bike streets, and promote a more protected pedestrian realm and more efficient bike realm.

- Design integrated and secure bicycle parking at residences, lecture halls, research facilities, and student service building.
- Sidewalks shall be 10 feet wide at a minimum.

MOB-7: Accompany each new building on campus with appropriate addition to the bicycle and pedestrian system, to ensure that the bicycle/pedestrian system expands to keep pace with campus development.

MOB-8: Install amenities to serve bicyclists and pedestrians, such as water fountains, campus maps, secure bicycle parking and lockers, and showers and changing rooms.

MOB-9: Link the campus bicycle system with regional bikeways to encourage utilitarian and recreational travel by bicycle. Prime candidates for campus-regional linkages include existing and planned paths along Lake Road and Bellevue Road.

MOB-10: Work cooperatively with transit providers to encourage transit-bicycle transfers by installing bike racks on all transit vehicles.

MOB-11: Develop a comprehensive public information strategy to publicize bicycle-and pedestrian-related pathway rules, regulations, and helpful hints.

Transit Service

MOB-12: Provide high-frequency, safe and convenient transit services that seamlessly connect major activity center on campus and in the neighboring University Community. Primary transit destinations would include the campus core, the Town Center, outlying commuter parking facilities, and key locations within on-campus and off-campus housing area. Each building in the campus core should be within a 5 minute walk of a transit stop.

MOB-13: Work with local and regional transit providers to coordinate transit service, and establish convenient transfers between transit and other modes of travel. Integrate transit corridors with the City of Merced Transit Corridors.

MOB-14: Contribute to development of a transit hub at the interface between the Town Center and campus core, for times transfers between local and regional transit connections.

MOB-15: Develop a transit fare policy and transit pass system that provides maximum incentives for transit ridership among University students and employees.

Vehicular Access and Parking

MOB-16: Design the secondary campus circulation system in a grid pattern, to disperse traffic and provide multiple connections to most destinations for all travel modes.

MOB-17: Protect the quality of campus core and residential areas by reducing or controlling traffic routing, volumes, and speeds on local streets.

MOB-18: Develop major parking reservoirs with permeable or gravel surfaces on the periphery of the campus core, at strategic intercept points along regional access routes.

MOB-19: Develop parking to jointly serve multiple facilities to minimize the total amount of parking required and encourage walking between nearby activities.

MOB-20: Provide priority parking for vanpools, carpools, and energy-efficient and low-pollution vehicles, with recharge stations for electric vehicles and provide a natural gas vehicle charging stations. Provide leadership by using alternative fuel or other low-emission vehicles in the campus service fleet.

MOB-21: Apply street standards in the campus core that account for service access needs.

4.13.3.10 University Community Plan

The adopted University Community Project (UCP) policies as they relate to transportation are listed below. This section also incorporates policies from other resource areas, such as land use, that have an effect on transportation.

Roads

T 1.1: Designate a functionally-classified system of principal transportation facilities that represents the major backbone circulation system needed to serve the Community Plan at acceptable levels of service. A sketch of the proposed backbone system is shown in Figure 12 [of the UCP]. Definitions of the street

classifications are given in Table 3, and typical cross-sections are shown graphically in Figures 12A through 12C [of the UCP].

T 1.2: Develop individual but coordinated master plans to guide design and implementation of the principal circulation infrastructure, including plans that address streets, bikeways, pedestrian ways, transit, and parking.

T 1.3: Reserve adequate rights-of-way to implement the designated circulation systems and designate access management restrictions for adjoining properties.

T 1.4: Promote the timely development of the principal circulation system, through phases coordinated with implementation of the land use element and with preparation of sub-area Specific Plans.

T 1.5: Ensure that regional transportation improvement programs keep pace with future needs, through coordination with the County, City, MCAG, and other regional agencies. Work with MCAG to augment the regional travel demand model to reflect the proposed land uses and circulation system within the Community area. The model will be used as a tool for evaluating and monitoring impacts of the Community Plan and future Specific Plans on the regional transportation system.

T 2.1: Design the Community's street system in a grid (or curvilinear grid) pattern, to disperse traffic throughout the community and provide multiple connections to most destinations. Figure 13 [of the UCP] includes an illustrative representation of a grid street pattern, compared with a system based on cul-de-sacs.

T 2.2: Discourage cul-de-sacs and other non-connecting street types.

T 3.1: Define a set of street design standards that minimize paved area while ensuring safe and adequate access to the Community.

T 3.2: Specify flexible design standards for arterial and primary collector streets to accommodate the mix of travel modes that may develop over time.

T 3.5: Protect the quality of residential areas by reducing or controlling traffic routing, volumes and speeds on local streets. Integrate traffic calming measures into street design to enhance livability of neighborhoods. Examples of calming measures may include roundabouts, neckdowns, raised crosswalks, and narrow

or curving streets; illustrations of these measures are shown in the following figures [in the UCP].

T 3.6: In addition to the County's traditional vehicle level of service (LOS) standard, define a "Person LOS" standard to measure the travel characteristics of all modes, and apply it in conjunction with the existing County standard. To maintain fundamental consistency with adopted County General Plan policies, in no case would a roadway be designed to operate below the existing County minimum vehicle LOS standard. However, in those cases where improvements to walk, bicycle, or transit modes could be made without causing the traffic LOS to deteriorate below the County standard, such improvements would increase the Person LOS measure and would be encouraged.

Pedestrian and Bicycle Circulation

T 4.1: Create a complete, interconnected bicycle and pedestrian circulation system that serves both commuter and recreational travel, and provides access to major destinations.

T 4.2: Work with UC Merced to establish convenient pedestrian and bicycle access routes to and through Campus.

T 4.3: Install amenities to serve bicyclists and pedestrians such as secure and convenient bicycle parking and shaded seating areas at public facilities.

T 4.4: Establish bicycle parking standards for new development.

T 4.5: Work with the transit provider to encourage transit-bicycle transfers by installing bike racks on buses.

Transit Services

T 5.1: Provide high-frequency transit services that seamlessly connect major destinations, including the UC Merced campus. Encourage convenient transfers between transit and other modes of travel.

T 5.2: Work proactively with local and regional transit providers to coordinate transit service. Work with transit providers, the regional Air Pollution Control District, and public utility providers to encourage actions that reduce pollution from

transit vehicles (such as purchasing vehicles that use alternative fuels, and providing fueling/charging stations).

T 5.3: Establish a transit hub at the interface between the Town Center and campus core for timed-transfers between local campus/Community transit service and regional transit connections serving the City of Merced, the rest of Merced County, and major interregional destinations.

T 5.4: Work with UC Merced to design a transit fare policy and transit pass system that provides maximum incentives for transit ridership for University students and employees.

T 5.5: Establish development standards, such as inclusion of handicap-accessible bus stops and shelters, to make transit attractive. Require development to fund its share of necessary transit facilities.

T 5.6: Establish a County/City/University transportation clearinghouse and website that provides information on local transit services and alternative travel options.

Parking

T 6.1: Plan for parking reservoirs at gateways to the Town Center for use by multiple tenants and residents. Discourage development of fragmented parking facilities that serve single parcels.

T 6.2: Encourage shared parking facilities at the interface between the Town Center and the UC Merced campus. UC Merced and the Community would jointly determine the appropriate parking supply, as well as the control and enforcement of use. Encourage development of parking structures in the Town Center when warranted by employment and residential densities.

T 6.3: Develop parking requirements that are consistent with the goals for increased use of alternative transportation modes, and that acknowledge shared parking opportunities.

T 6.4: Encourage use of "intelligent parking systems" such as message signs indicating real-time parking availability by location.

T 6.5: Provide priority parking for vanpools, carpools, and energy-efficient and low-pollution vehicles, including recharge stations for electric vehicles.

T 6.6: Designate residential permit parking areas as needed to protect neighborhoods from parking intrusion from adjacent land uses.

T 6.7: Enforce permit parking restrictions in residential areas near campus, and parking time limits in town center.

Reducing Automobile Trips

T 7.1: Encourage non-residential developments to offer telecommute and flexible work-hour opportunities, and provide employee incentives for using transit, ridesharing, bicycling, and walking.

T 7.2: Locate parking at strategic intercept points to minimize driving into and through central areas of the Community and Campus. Serve remote parking with frequent transit shuttles.

T 7.3: Promote ridesharing through public information and outreach.

T 7.4: Encourage non-residential developments to provide amenities for bicyclists, including showers and changing facilities.

Land Use

LU 4.3: Site and design land uses and buildings to maximize the Community's quality of life, including the establishment of pedestrian-oriented mixed use districts and residential neighborhoods that reflect the traditional qualities of Merced, while providing opportunities for innovative and creative forms of development.

LU 4.4: Locate the highest development densities within and adjacent to the Town Center and primary transit corridors and stations to support community activity and transit use. Prioritize areas adjacent to the Town Center and campus as housing locations for UC Merced students, faculty, and staff.

LU 4.5: Integrate the Community's land use patterns, urban form, transportation and infrastructure corridors, and open spaces with those of the UC Merced campus, promoting a seamless interaction of community and campus activities.

LU 4.6: Locate and design land uses to promote efficiency of access, reduce costs, and enhance livability by the sharing of recreation, community and public facilities, institutions and cultural attractions, activity areas, and transportation infrastructure.

LU 5.7: Develop a multi-modal transportation center that serves both the Community and the campus at the earliest feasible date to lessen automobile dependence. Work with the UC in the siting and design of this facility to ensure its compatibility with adjoining uses and the transportation network and facilities.

LU 5.18: Develop shared parking facilities in lieu of separate parking for each site/use in the Town Center, including possible parking facilities to serve both community and campus uses.

LU 5.19: Design internal local streets to emphasize pedestrian activity (minimum of 15' wide sidewalks) and slow traffic using such techniques as appropriate width, angled parking, traffic circles, landscaped "bulb outs," alleys, and comparable techniques.

4.13.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

The president's Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under NEPA is summarized in **Subsection 4.0.6.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the 2008 *California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR Sec. 1508.14). Thresholds of significance used to evaluate impacts are based on criteria used by the local jurisdictions and accepted professional practice for transportation planning and engineering.

Roadway System

For the purpose of this Draft EIS/EIR, traffic impacts would be significant if implementation of the Proposed Action or its alternatives would:

- cause the deterioration of a signalized intersection from LOS D or better under baseline (Future No Project) conditions to LOS E or LOS F under Future With Project conditions; ***or*** an increase in average delay of 5 or more seconds for a signalized intersection operating at LOS E or LOS F under baseline (Future No Project) conditions;

- cause a roadway segment to exceed its capacity (based on LOS D threshold) under Future With Project conditions, when compared to Future No Project conditions;

- contribute 1 percent or more to the total projected future traffic on a roadway segment for which there is a planned widening project or new connection reflected in the 2030 MCAG Travel Demand Model, that is not fully funded;

- cause the deterioration of the V/C ratio of a roundabout approach from 0.85 or better to greater than 0.85 ***or*** an increase in the V/C ratio of 0.05 or more for a roundabout approach operating with a V/C ratio greater than 0.85 under Future No Project conditions;

- substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

- result in inadequate emergency access; or

- result in inadequate parking capacity.

Transit System

Transit impacts would be significant if implementation of the Proposed Action or its alternatives would:

- disrupt existing transit services or facilities (this includes disruptions caused by proposed driveways on transit streets, impacts to transit stops/shelters, and impacts to transit operations from traffic improvements proposed or resulting from the Proposed Action);

- interfere with planned transit services or facilities;

- create demand for public transit services above that which is provided or planned; or

- result in conflicts or creates inconsistencies with adopted transit system plans, guidelines, policies or standards.

Bicycle System

Bicycle impacts would be significant if implementation of the Proposed Action or its alternatives would:

- disrupt or displace existing bicycle facilities;

- interfere with planned bicycle facilities (this includes failure to dedicate right-of-way for planned on- and off-street bicycle facilities included in an adopted Bicycle Master Plan);

- conflict with or create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards.

Pedestrian System

Pedestrian impacts would be significant if implementation of the Proposed Action or its alternatives would:

- disrupt existing pedestrian facilities (this can include adding new vehicular, pedestrian or bicycle traffic to an area experiencing pedestrian safety concerns such as an adjacent crosswalk or school);
- interfere with planned pedestrian facilities; or
- conflict with or create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards.

4.13.4.1 Issues Not Discussed Further

The following issue is not discussed further in this section for reasons presented below.

- The Proposed Action (or an alternative) results in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

The Proposed Action would not affect air traffic patterns because the project site is not within the land use planning area of a public airport.

4.13.5 METHODOLOGY FOR EVALUATING EFFECTS

4.13.5.1 Traffic Forecasting Methodology

Merced County uses the Merced County Association of Governments (MCAG) for conducting regional transportation planning. As part of its planning processes, MCAG maintains a regional travel demand model that is used as a tool for evaluating and monitoring impacts of major proposed projects on the regional transportation system. The MCAG model forecasts average weekday daily and PM peak hour traffic volumes on the freeways, arterials, and major collector roads in the Merced region. The version of the MCAG model consistent with the 2007 Merced County Regional Transportation Plan (RTP) was used to generate 2030 traffic forecasts for the Proposed Action and all project alternatives. For the No Project alternative, no growth was included in the model's traffic analysis zones (TAZs) representing the UC Merced Campus, Community North, and Community South. For the Proposed Action and all project alternatives, trips were directly added to the appropriate zones using the model's "special generator" variable, based on a detailed trip generation analysis completed for each alternative.

The 2030 model assumes a level of development in the Merced region estimated by MCAG for the year 2030 that is consistent with County growth projections from the California Department of Finance and with presently-adopted general plans of MCAG jurisdictions. These development forecasts are considered to be an adopted "summary of projections" for purposes of determining cumulative impacts, as defined in Section 15130(b)(1)(B) of the *State CEQA Guidelines*.

It should be noted that forecast volumes from the MCAG Model were not used directly in developing the future scenarios. Rather forecast traffic volumes were adjusted based on the incremental change between the Base year model estimates and the Future model forecasts using the following formula: adjusted forecast volume = base year count + (model forecast volume – base year model volume). This adjustment process helps minimize model error in the forecasts where the error is known (i.e., where base year counts are available).

4.13.5.2 Future Roadway Capacity Assumptions

Future roadway segment capacity is based on the MCAG Travel Demand Model and its reflection of the expected roadway improvement projects and corresponding capacities in the 2007 RTP. Capacities presented in **Table 4.13-6, Roadway Capacities – Future Conditions (2030)**, are conservative as they are based on the number of lanes on the mainline segments and do not necessarily consider added turn lanes (and their added capacity) at the intersections.

Table 4.13-6
Roadway Capacities – Future Conditions (2030)

No.	Roadway Segment	Location	Existing			Future		
			Facility Type	No. of Lanes	Capacity	Facility Type	No. of Lanes	Capacity
1.	Lake Rd	South of Bellevue	Collector	2	12,000	Collector	2	12,000
1 A.	Campus Pkwy	South of Bellevue	Does not Exist			Arterial	4	36,000
2.	Lake Rd	South of Cardella	Collector	2	12,000	Collector	2	12,000
2 A.	Campus Pkwy	South of Cardella	Does not Exist			Arterial	4	36,000
3.	McKee	South of Yosemite Ave	Arterial	2	18,000	Arterial	2	18,000
4.	McKee	South of Olive	Arterial	2	18,000	Arterial	2	18,000
5.	Yosemite Ave	East of SR 59	Arterial	2	18,000	Arterial	4	36,000
6.	Yosemite Ave	G St. to N. Parsons	Arterial	4	36,000	Arterial	4	36,000

No.	Roadway Segment	Location	Existing			Future		
			Facility Type	No. of Lanes	Capacity	Facility Type	No. of Lanes	Capacity
7.	Yosemite Ave	N. Parsons to Lake	Collector	2	12,000	Collector	4	24,000
8.	Yosemite Ave	East of Lake	County	2	21,600	County Road	2	21,600
9.	Yosemite Ave	East of Kibby	County	2	21,600	County Road	2	21,600
10.	Yosemite Pkwy	West of Santa Fe Ave	Arterial	2	18,000	Arterial	4	36,000
11.	Yosemite Pkwy	East of Santa Fe Ave	Highway	2	43,200	Highway	4	86,400
12.	Olive Ave	East of SR 59	Arterial	6	54,000	Arterial	6	54,000
13.	Olive Ave	West of G St	Arterial	6	54,000	Arterial	6	54,000
14.	Olive Ave	East of G St	Arterial	4	36,000	Arterial	4	36,000
15.	G St	South of Bellevue	Arterial	2	18,000	Arterial	4	36,000
16.	G St	South of Cardella	Arterial	2	18,000	Arterial	4	36,000
17.	G St	South of Yosemite Ave	Arterial	4	36,000	Arterial	4	36,000
18.	G St	South of Olive	Arterial	4	36,000	Arterial	4	36,000
19.	M St	North of 23rd	Arterial	4	36,000	Arterial	4	36,000
20.	M St	South of 23rd	Arterial	4	36,000	Arterial	4	36,000
21.	SR 59	South of Bellevue	Arterial	2	18,000	Arterial	2	18,000
22.	SR 59	South of Cardella	Arterial	2	18,000	Arterial	2	18,000
23.	SR 59	South of Yosemite Ave	Arterial	2	18,000	Arterial	2	18,000
24.	SR 59	South of Olive	Arterial	2	18,000	Arterial	4	36,000
25.	Cardella Road	Between SR 59 and M St.	Collector	4	24,000	Arterial	4	36,000
26.	Cardella Road	Between G St. and Lake	Collector	4	24,000	Arterial	4	36,000
27.	16th St	West of SR 59	Arterial	4	36,000	Arterial	4	36,000
28.	Kibby	South of Yosemite Ave	County	2	21,600	County Road	2	21,600
29.	Kibby	North of Yosemite Pkwy	County	2	21,600	County Road	2	21,600
30.	N. Parsons Ave	E. Olive to Yosemite	Collector	2	12,000	Collector	2	12,000
31.	S. Parsons Ave	E. Olive to Santa Fe	Collector	2	12,000	Collector	2	12,000
32.	Bellevue Road	Lake to G St	Collector	2	12,000	Arterial	6	54,000

No.	Roadway Segment	Location	Existing			Future		
			Facility Type	No. of Lanes	Capacity	Facility Type	No. of Lanes	Capacity
33.	Bellevue Road	G St. to SR 59	Collector	2	12,000	Arterial	6	54,000
34.	Bellevue Road	West of SR 59	Collector	2	12,000	Collector	6	12,000
35.	SR 140	West of Massasso	Collector	2	12,000	Highway	2	43,200
36.	SR 99	North of 16th St	Freeway	4	96,000	Freeway	4	96,000
37.	SR 99	North of M St	Freeway	4	96,000	Freeway	4	96,000
38.	SR 99	South of Yosemite Pkwy	Freeway	4	96,000	Freeway	4	96,000
39.	SR 99	South of Mission Ave	Freeway	4	96,000	Freeway	4	96,000
40.	Campus Pkwy	South of Yosemite Ave	Does not Exist			Expressway	4	62,500
41.	Campus Pkwy	South of Olive Ave	Does not Exist			Expressway	4	62,500
42.[1]	Cardella Road	M St. to G St	Collector	2	12,000	Arterial	4	36,000
43.	R Street	W. Yosemite to Bellevue	Does not Exist			Arterial	4	36,000
44.	N. Parsons Ave	E. Yosemite to Bellevue	Does not Exist			Arterial	4	36,000

Source: Fehr & Peers, October 2008
Notes:
[1] *Segment 42: Existing volume estimated.*

4.13.5.3 Project Trip Generation

UC Merced Campus

The Institute of Transportation Engineers trip rate for universities is 2.38 daily trips per student. Because ITE rates are averages of studies done nationwide, a more appropriate local trip rate is desirable. A trip generation survey, conducted for the current campus, provided a rate of 2.33 trips per day per enrolled student. The campus trip generation rate is expected to be higher than average at this stage of development, due to a low number of students, the low number of student beds, limited transit services, and the absence of amenities in the vicinity of the campus. The campus trip generation rate is expected to decline in the future as more on-campus housing is built for students and transit services are improved. An average rate of 2.08 daily trips per enrolled student has been applied to the campus in the traffic analysis. This trip generation rate represents vehicular travel that crosses the campus boundary to either

the adjacent communities or elsewhere in the region; trips that remain entirely internal to the campus are not reflected in this analysis, because they do not affect the regional roadway system. Trip generation rate used to estimate trips associated with the Merced campus compares well with trip generation rates of other UC campuses such as UC Davis and UC Santa Cruz. The daily per enrolled student trip generation rate for UC Davis is 2.40 trips per day and is 1.77 trips for UC Santa Cruz. The rate is lower at Santa Cruz due to the level of transit service provided at that campus. UC Davis is considered to be the closest in overall character to the proposed UC Merced Campus and University Community, as well as its emphasis on alternative modes of transportation. However, some characteristics of UC Davis do not exactly match the proposed campus and UC Santa Cruz has more similarities than UC Davis. For example, UC Davis houses less than 25 percent of students on campus, whereas UC Santa Cruz houses 50 percent, similar to the proposed UC Merced Campus. However, both associated communities of UC Santa Cruz and UC Davis provide nearby housing for off-campus students and employees. Approximately 56 percent of off-campus students, faculty, and staff live within 3 miles of the UC Santa Cruz campus. Approximately 47 percent of campus employees at UC Davis live within the City of Davis. An even higher percentage of off-campus students live within the City of Davis, based on the student mode split of the campus of approximately 78 percent for walk, bike, and transit, combined. UC Davis provides substantial commercial and retail opportunities directly adjacent to the campus, which is not the case in Santa Cruz.

University Community

The amount of daily traffic expected to be generated by the development of the proposed University Community was estimated based on trip generation rates contained in the MCAG model. MCAG has validated these rates with data gathered within Merced County for the Statewide Travel Survey. In general, trip generation rates for non-residential uses are similar to the national average rates published in ITE's *Trip Generation*. Trip generation rates for residential uses are approximately 20 to 25 percent lower for the University Community based on MCAG model rates than standard ITE rates. The use of these lower rates is consistent with recommended practice, as stated in the ITE *Trip Generation Handbook*, which states that "if available, properly collected and validated local rates should be considered in addition to the national data base."

Total Project Trips

At buildout, the University Community is expected to generate approximately 146,600 daily trips. The UC Merced Campus is expected to generate approximately 52,000 trips. A portion of the trips generated from the Campus and the adjacent University Community are expected to remain within the project site (Campus and University Community sites combined), due to the relative proximity of the University

Community to the Campus, as well as the likely tendency of the University Community to attract campus-related residents. The internal trips include vehicle, walking, biking, and transit trips.

As mentioned above, 56 percent of UC Santa Cruz's faculty, staff, and commuting students, live within 3 miles of the UC Santa Cruz campus, and an additional 23 percent live within 5 miles. Similar information from UC Davis indicates that approximately half of the faculty and staff live in Davis, as do a very high proportion of commuting students. Given that the proposed University Community is designed to directly support the needs of the UC Merced Campus, it is likely that, in the long run, sizable percentages of campus employees and commuting students will live within the University Community and travel between the community and the campus. Assumptions about travel within the campus and the two subareas of the University Community (Community North and Community South) are based on the relative number of residential trips versus non-residential trips generated by these areas, and the specific types of trip generators within each. The internal trip percentages have been developed to ensure that the residential internalization matches the non-residential internalization. In other words, each internal trip beginning at a residential use has a matching destination at a non-residential use in the Campus, Community North, or Community South. At buildout, the following proportions of trips are expected to remain internal to the project site:

- All trips generated by schools and parks
- 70 percent of residential trips
- 90 percent of retail trips
- 60 percent of office trips
- 55 percent of business park trips

Overall, approximately 70 percent of the daily trips generated by the proposed Campus and University Community are expected to remain within the immediate Campus and University Community area, and 30 percent of the trips are expected to travel to other parts of the study area.

Trip generation rates for the Campus and the University Community are presented in **Table 4.13-7, Trip Generation – Proposed Action (2030)**.

Table 4.13-7
Trip Generation – Proposed Action (2030)

	Acres	Dwelling Units	Sq. Ft.	Empl.	Trip Rate	Trip Generation	Regional		Local	
							Prod	Attr	Prod	Attr
Community North										
Schools	43					3,603		-		3,603
Parks	81				1.59/Acre	129		-		129
Retail	19		392,100	980	19.90/Employee	19,502		1,950		17,552
Office	15		606,300	1,732	3.80/Employee	6,582		2,633		3,949
Business Park (Research/R&D)	71		2,308,300	6,595	3.35/ Employee	22,093		9,942		12,151
Single Family Units	375	4,774			7.40/ D.U.	35,328	10,598		24,729	
Multi-Family Units	14	480			4.65/ D.U.	2,232	670		1,562	
Sub-Total Community North	618	5,794	3,306,700	9,307	N/A	89,469	11,268	14,525	26,291	37,384
Community South										
Schools	80	N/A	N/A	N/A	N/A	4,804	N/A	N/A	N/A	4,804
Parks	148	N/A	N/A	N/A	1.59/Acre	235	N/A	N/A	N/A	235
Retail	15	N/A	250,000	625	19.90/Employee	12,438	N/A	1,244	N/A	11,194
Office	9	N/A`	140,000	400	3.80/Employee	1,520	N/A	608	N/A	912
Single Family Units	560	4,029	N/A	N/A	7.40/D.U.	29,815	8,944	N/A	20,870	N/A
Multi-Family Units	75	1,794	N/A	N/A	4.65/D.U.	8,342	2,503	N/A	5,839	N/A
Sub-Total Community South	887	5,823	390,000	1,025	N/A	57,154	11,447	1,852	26,710	17,145
Community Total	1,531	11,617	3,696,700	10,332	N/A	146,623	22,715	16,377	53,001	54,529

	Acres	Dwelling Units	Sq. Ft.	Empl.	Trip Rate	Trip Generation	Regional		Local	
							Prod	Attr	Prod	Attr
UC Campus	25,000	Students	N/A	N/A	2.08/Student	52,000	9,100	9,100	16,900	16,900
Total Trip Generation, Campus + Community						**198,623**	**31,815**	**25,477**	**69,901**	**71,429**

Source: Fehr & Peers, October 2008
Notes: [1] Total acreages do not include streets and parking.
N/A: not applicable
D.U. Dwelling Unit

4.13.5.4 Trip Distribution and Assignment

The MCAG Travel Demand Model was used for trip distribution. The numbers of regional (external) trips generated by the Campus and University Community, determined by the previously-discussed process, were coded into appropriate model TAZs as special generators. The model was applied using MCAG's standard application procedures. A modeling technique known as "select zone" analysis was used to track traffic generated by the Campus, Community North, and Community South throughout the roadway network. At full buildout, the geographic distribution of assigned campus and community trips presented the following general pattern:

- 79 percent to the greater Merced area
- 6 percent to the west
- 11 percent to the south
- 5 percent to the north and east of the project site

4.13.5.5 Future Levels of Service

Roadway Segments

For road segments, future model outputs were compared to existing model outputs. Existing counts were then scaled based on the projected growth between the future model and the existing model results. Consistent with standard traffic forecasting procedures, the scaling factor was determined based on the ratio of the model-predicted volume for the existing conditions to existing counts. If the model over-predicts or under-predicts existing volumes by a significant amount, the projected growth between existing and future was added to existing counts for that segment. If the existing model volumes were close to counts, then the existing counts were scaled up by a ratio of the future volumes to existing volumes. **Table 4.13-8, Roadway LOS – Proposed Action – Future Conditions (2030)**, shows roadway segment LOS under Existing, Future No Project, and Future Plus Project conditions.

Intersections

Future intersection volumes were obtained by adding existing counts to the projected growth, as determined by the difference of Future and Base year model outputs. Intersection LOS was determined using the Highway Capacity Manual (HCM) methodology. Under Future conditions, signal timings were optimized to match new volumes. Existing coordination between signals was retained and coordination was added along Campus Parkway. Intersection volumes for Future with Project conditions are presented in **Figure 4.13-8, Future + Proposed Action Conditions (Intersections 1–11); Figure 4.13-9,**

Future + Proposed Action Conditions (Intersections 12–22); Figure 4.13-10, Future + Proposed Action Conditions (Intersections 23–33); and **Figure 4.13-11, Future + Proposed Action Conditions (Intersections 34–42).** Volumes for Future No Project conditions are presented in **Figure 4.13-12, Future No Project Conditions (Intersections 1-11), Figure 4.13-13, Future No Project Conditions (Intersections 12-22), Figure 4.13-14, Future No Project Conditions (Intersections 23-33);** and **Figure 4.13-15, Future No Project Conditions (Intersections 34–42). Table 4.13-18, Roadway LOS –Future Conditions (2030 With General Plan Update),** presented at the end of this section, provides LOS information for the roadway segments under the conditions of the adopted general plan and the proposed General Plan Update. It was assumed that by 2030, all study intersections would be within the sphere of influence of the City of Merced, and that the limit of acceptable operations would be LOS D.

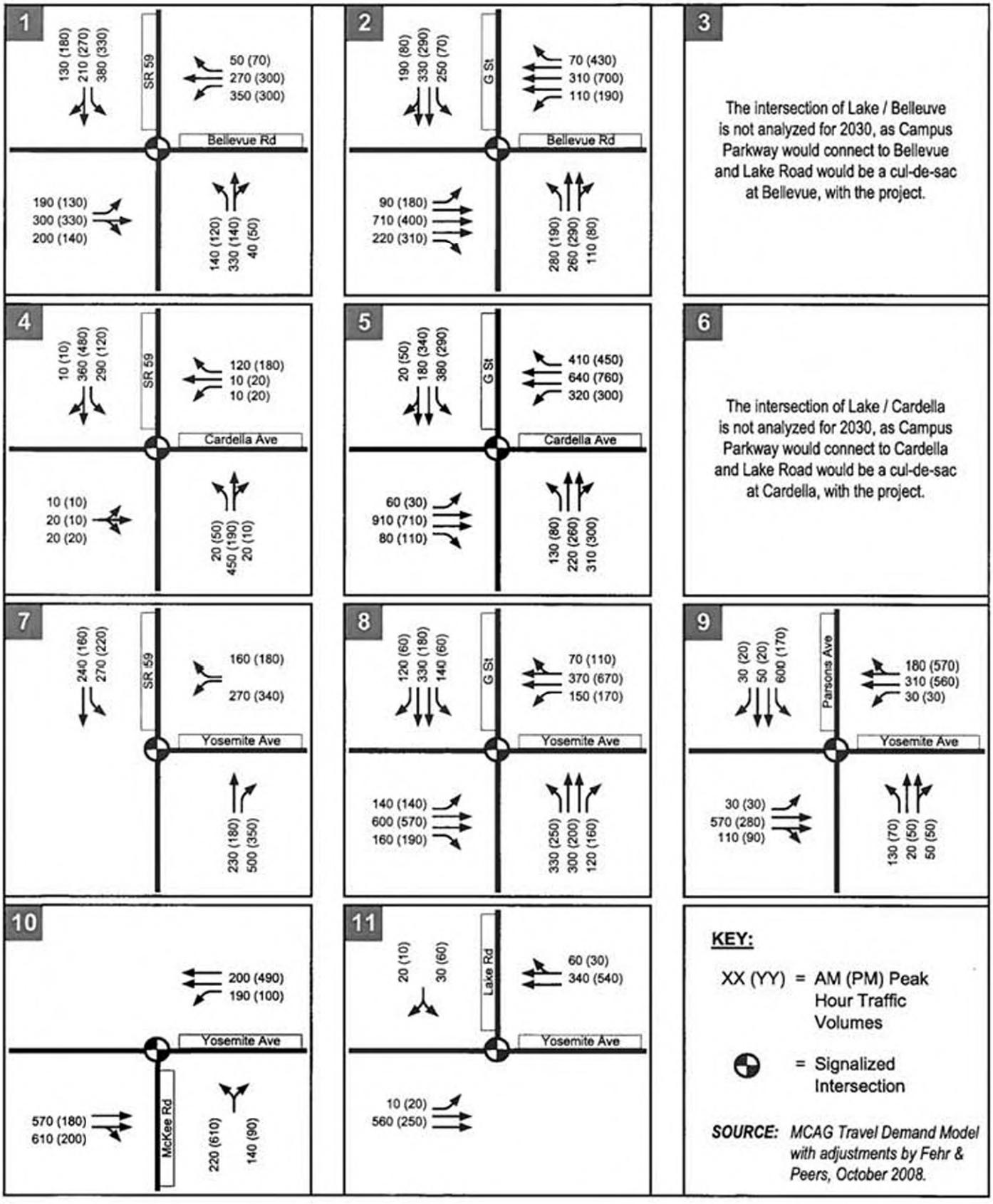
4.13.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.13.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact TRANS-1: **The Proposed Action would contribute 1 percent or more to the traffic growth projected for 18 roadway segments planned to be widened in the future, cause the LOS of two study intersections to deteriorate to unacceptable levels, and result in a significant increase in delay at one intersection. (*Significant; Significant and Unavoidable*)**

The Proposed Action comprises the development of the Campus, Community North, and Community South over a long period of time. Traffic volumes resulting from the Proposed Action are projected to increase incrementally over time. The impacts presented below reflect the combined effect of the traffic that would be generated at buildout of each subarea. Even though buildout of the Campus and University Community is not expected to occur by 2030, as noted in **Section 4.0**, the year 2030 is used as the horizon or buildout year because the regional traffic model's horizon year is 2030.

Although the full impact of the Proposed Action is presented below and the significance of the impact is determined based on the total traffic generated by the Proposed Action, the analysis below also presents the relative contribution of each subarea (Campus, Community North, and Community South) to the traffic at locations where there would be significant impacts. The Proposed Action's impacts on roadway segments within the study area are presented first, followed by the impacts at study intersections.

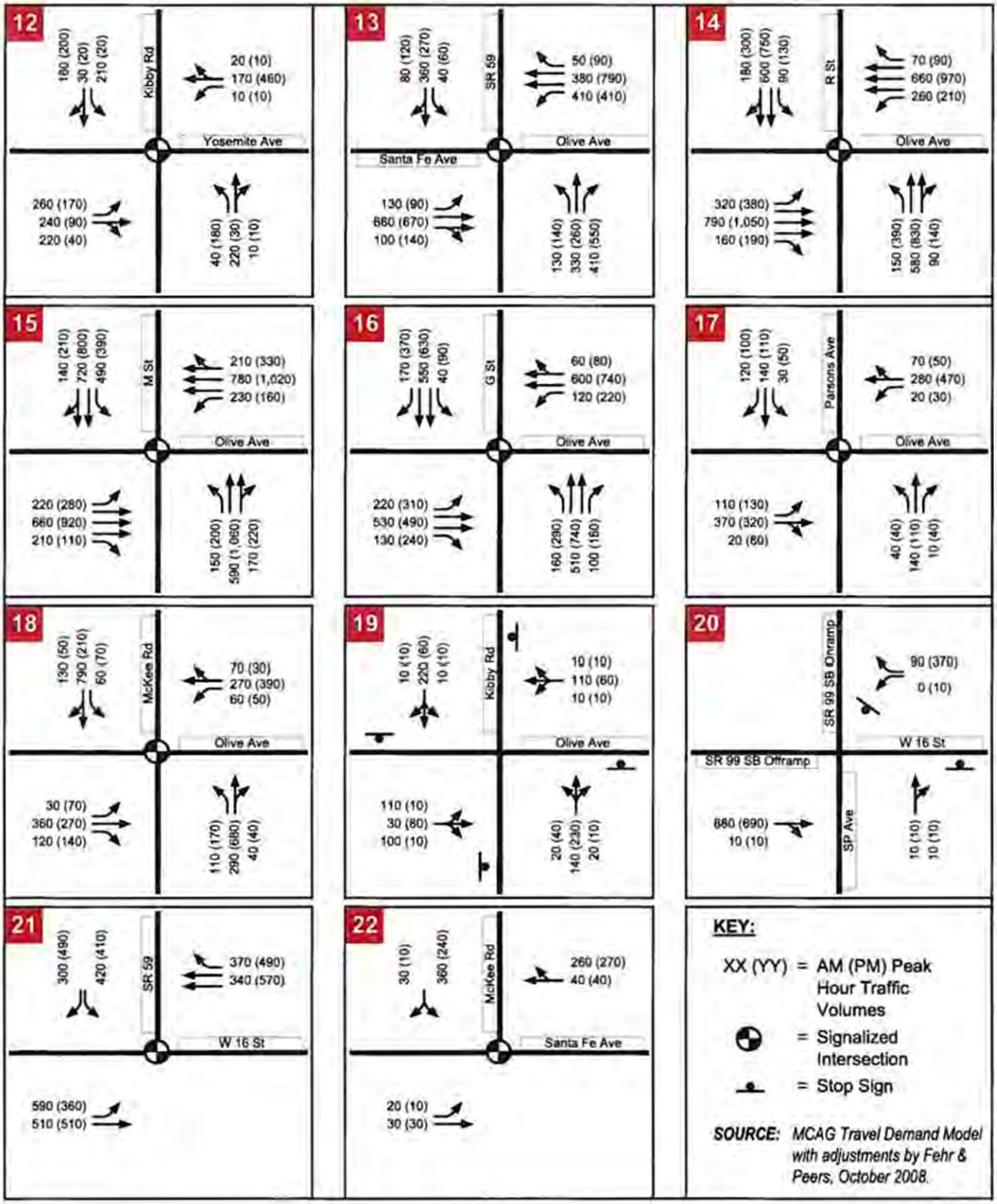


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-8**

Future + Proposed Action Conditions (Intersections 1-11)

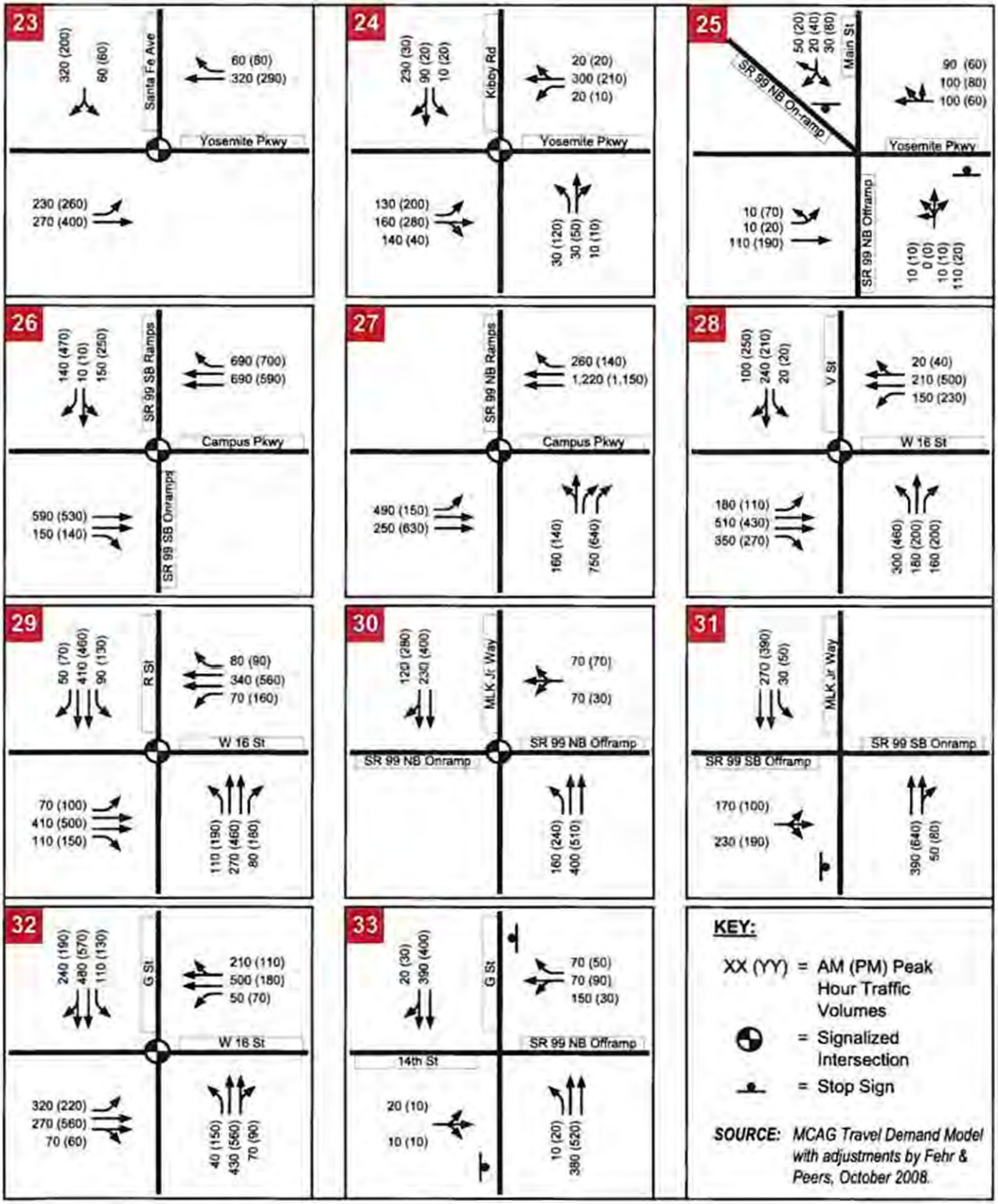


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-9**

Future + Proposed Action Conditions (Intersections 12-22)

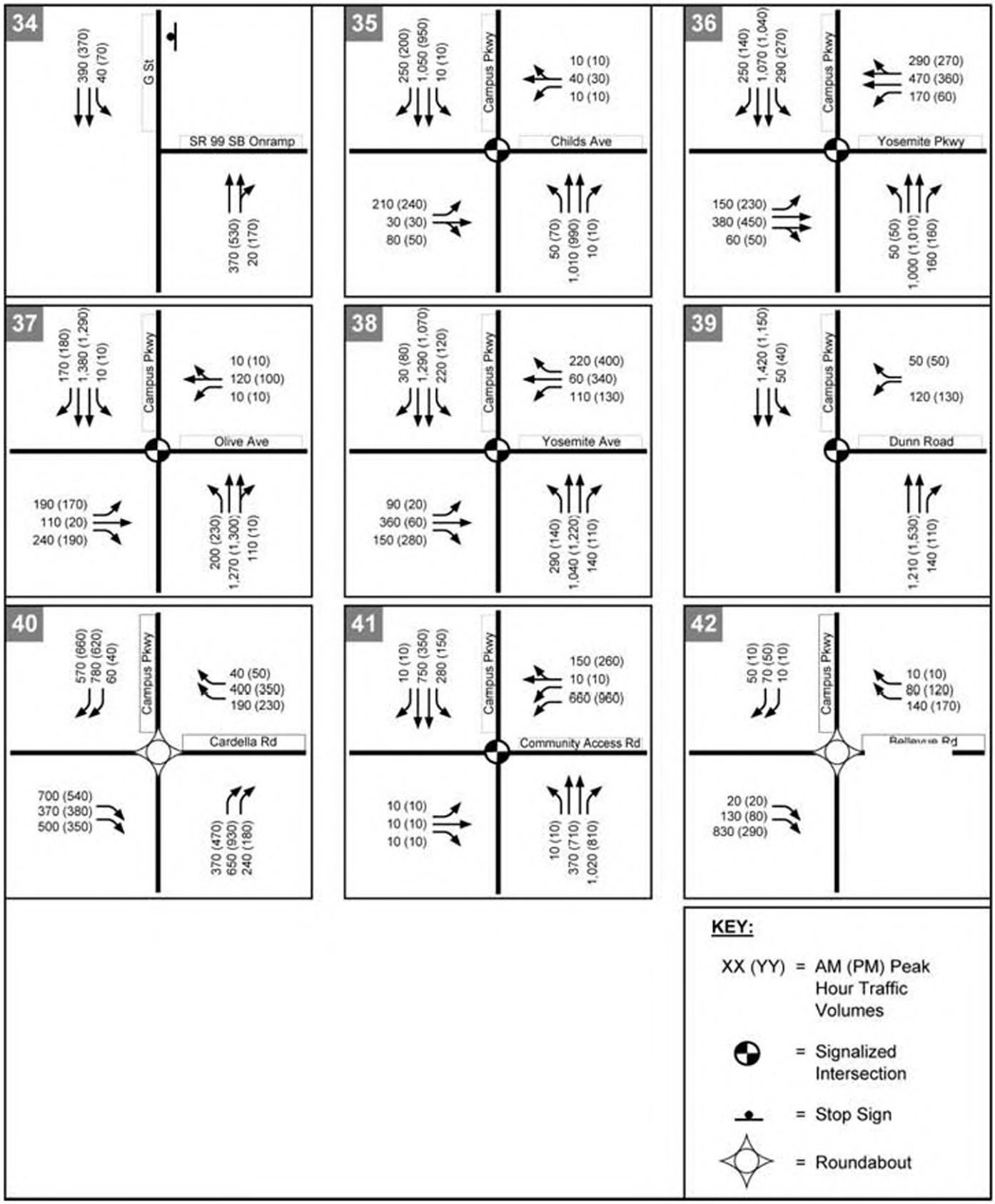


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-10**

Future + Proposed Action Conditions (Intersections 23-33)

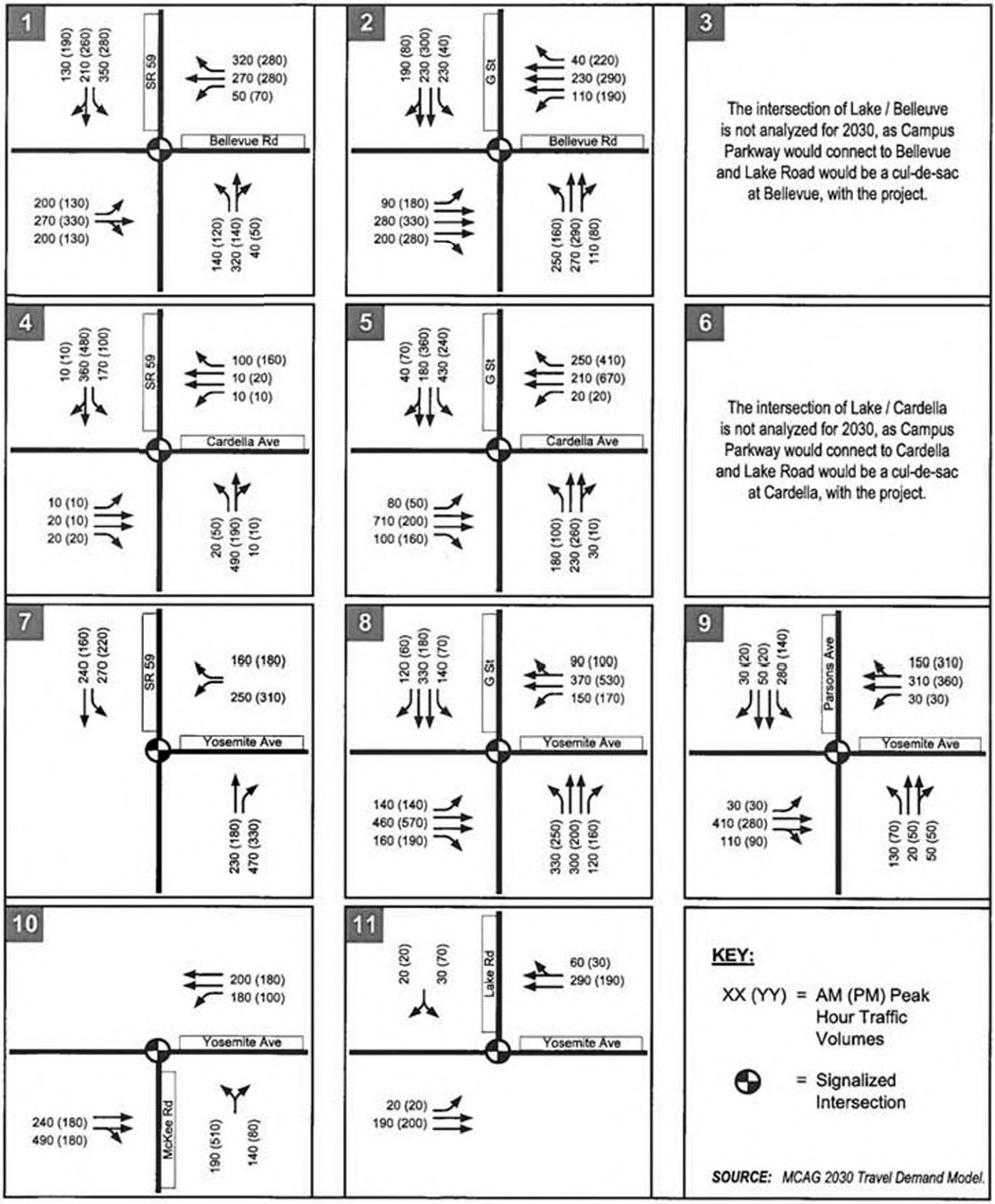


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-11**

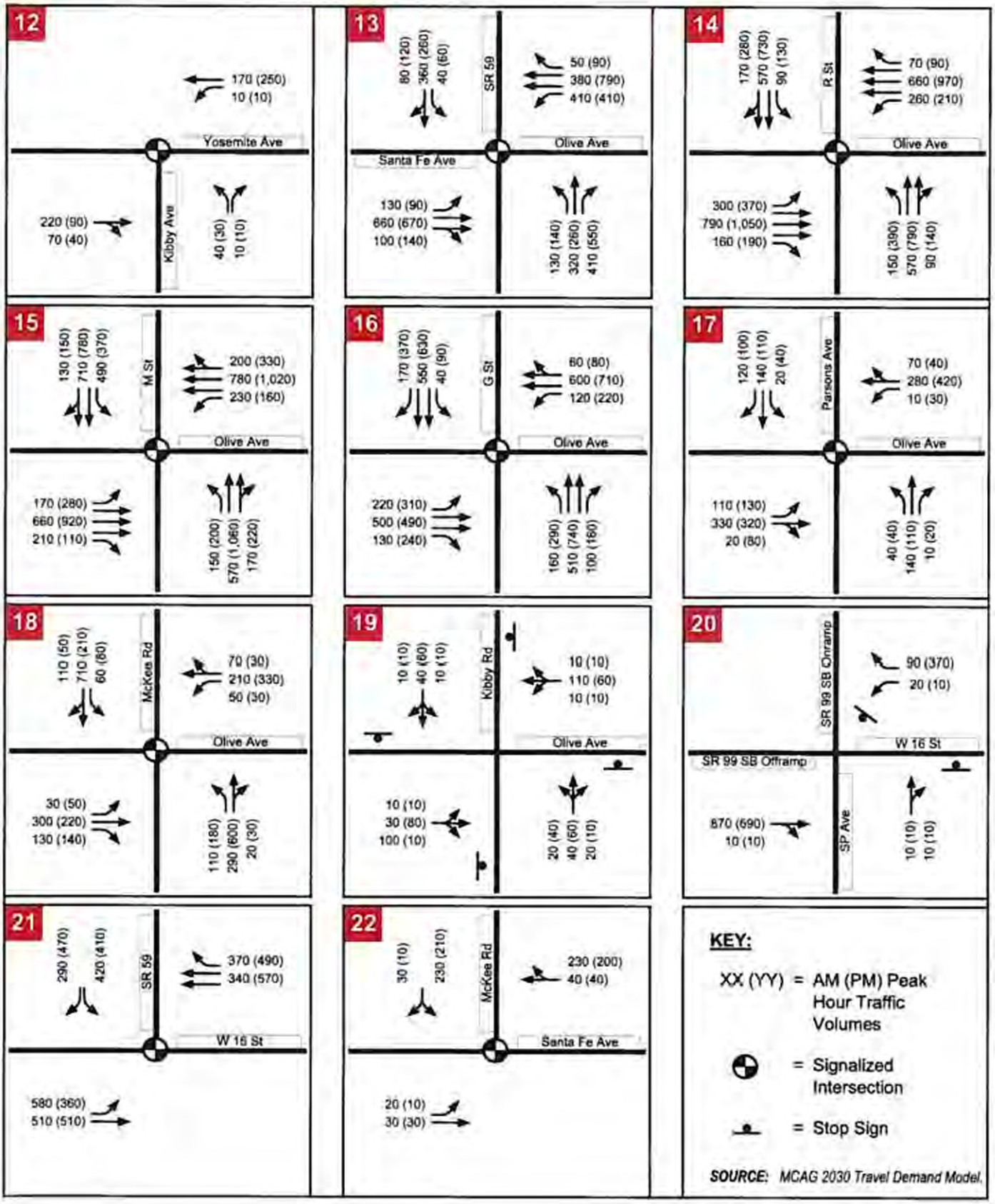
Future + Proposed Action Conditions (Intersections 34-42)



SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-12**

Future No Project Conditions (Intersections 1-11)

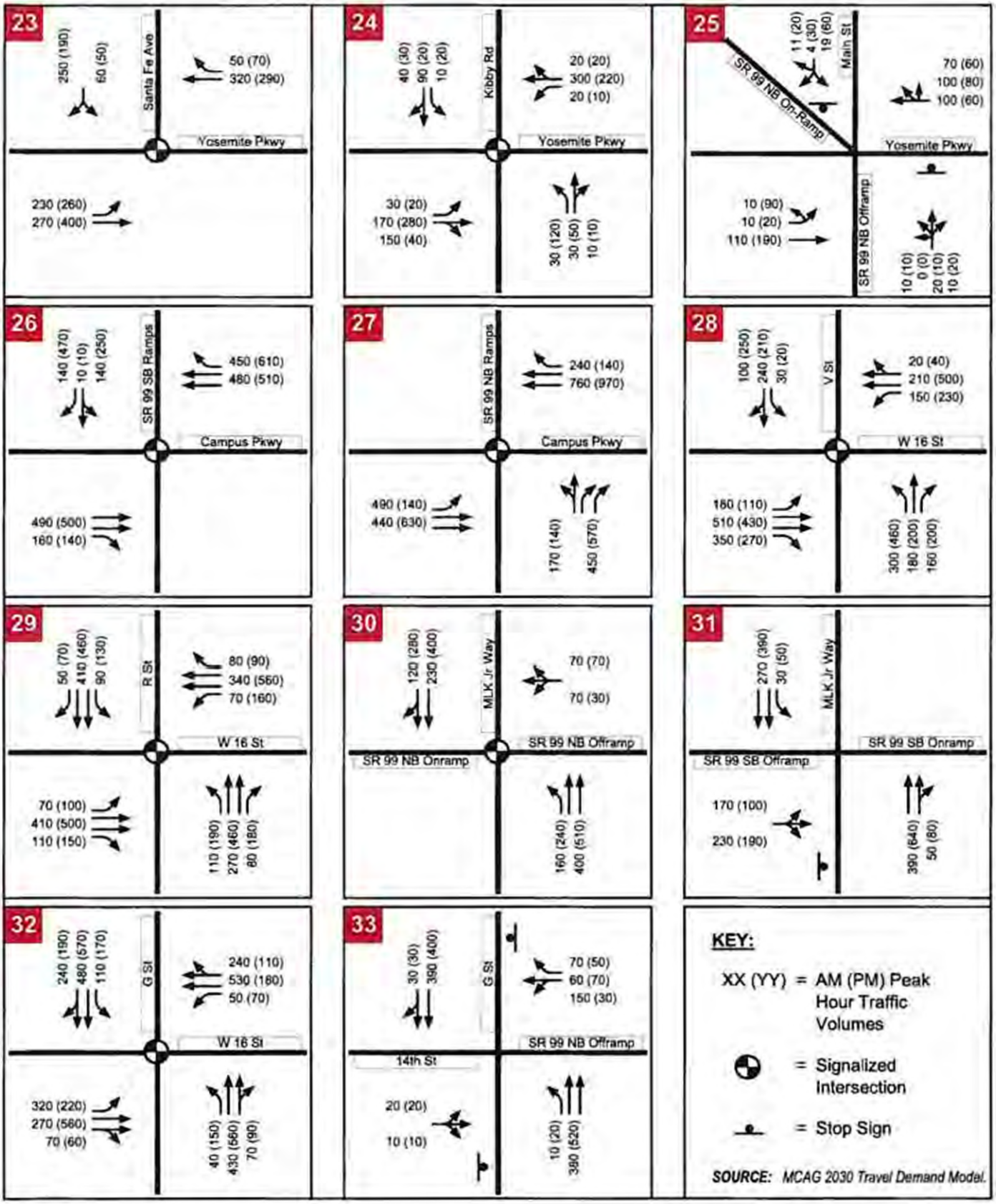


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE 4.13-13

Future No Project Conditions (Intersections 12-22)

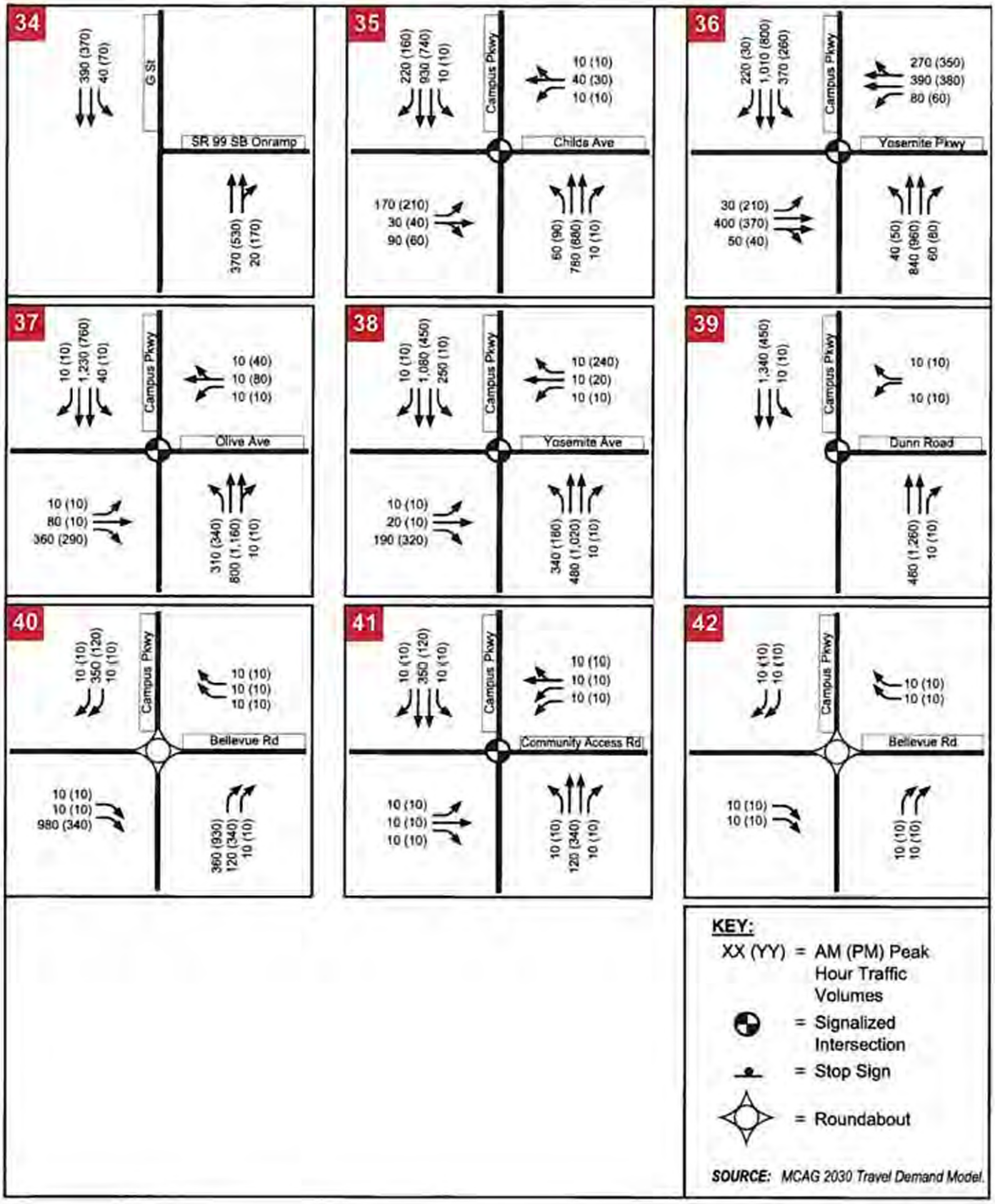


NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-14**

Future No Project Conditions (Intersections 23-33)



NOT TO SCALE

SOURCE: Fehr & Peers - October 2008

FIGURE **4.13-15**

Future No Project Conditions (Intersections 34-42)

Table 4.13-8
Roadway LOS – Proposed Action – Future Conditions (2030)

No.	Roadway Segment	Location	Existing					2030						
			Facility Type	Number of Lanes	Capacity	Volume (2008)	LOS	Facility Type	Number of Lanes	Capacity	No Project Volume	No Project LOS	With Project Volume	With Project LOS
1.	Lake Rd	South of Bellevue	Collector	2	12,000	2,450	A	Local Access Street – Not Analyzed						
1 A.	Campus Pkwy	Cardella to Bellevue	Does not Exist					Arterial	4	36,000	8,050	A	19,750	A
2.	Lake Rd	Yosemite to Cardella	Collector	2	12,000	2,500	A	Local Access Street – Not Analyzed						
2 A.	Campus Pkwy	Yosemite to Cardella	Does Not Exist					Arterial	4	36,000	24,300	B	31,000	D
3.	McKee	South of Yosemite Ave	Arterial	2	18,000	5,250	A	Arterial	2	18,000	11,900	B	14,150	C
4.	McKee	South of Olive Ave	Arterial	2	18,000	8,250	A	Arterial	2	18,000	16,550	D	17,300	D
5.	W. Yosemite Ave	SR 59 to G St. East of SR 59	Arterial	2	18,000	12,150	B	Arterial	4	36,000	13,450	A	13,350	A
6.	E. Yosemite Ave	G St. to N. Parsons	Arterial	4	36,000	15,100	C	Arterial	4	36,000	21,850	B	27,750	C
7.	E. Yosemite Ave	N. Parsons to Lake/ Campus Pkwy[1]	Collector	2	12,000	4,850	A	Collecto r	4	24,000	8,450	A	17,500	B
8.	E. Yosemite Ave	Lake to Kibby	County Road	2	21,600	2,450	A	County Road	2	21,600	10,900	A	18,950	D
9.	E. Yosemite Ave	East to Kibby	County Road	2	21,600	2,150	A	County Road	2	21,600	10,150	A	11,700	A

No.	Roadway Segment	Location	Existing					2030						
			Facility Type	Number of Lanes	Capacity	Volume (2008)	LOS	Facility Type	Number of Lanes	Capacity	No Project		With Project	
											Volume	LOS	Volume	LOS
10.	Yosemite Pkwy	West of Santa Fe Ave	Arterial	2	18,000	10,400	A	Arterial	4	36,000	8,350	A	14,550	A
11.	Yosemite Pkwy	East of Santa Fe Ave	Highway	2	43,200	7,550	A	Highway	4	86,400	10,250	A	16,800	A
12.	Olive Ave	East of SR 59	Arterial	6	54,000	32,250	A	Arterial	6	54,000	43,150	C	43,850	C
13.	Olive Ave	West of G St	Arterial	6	54,000	26,600	A	Arterial	6	54,000	35,350	B	38,300	B
14.	Olive Ave	East of G St	Arterial	4	36,000	18,500	A	Arterial	4	36,000	24,700	B	25,350	B
15.	G St	South of Bellevue	Arterial	2	18,000	6,350	A	Arterial	4	36,000	19,050	A	20,950	A
16.	G St	Cardella to Bellevue	Arterial	2	18,000	6,650	A	Arterial	4	36,000	15,150	A	18,550	A
17.	G St	South of Yosemite Ave	Arterial	4	36,000	15,000	A	Arterial	4	36,000	24,400	B	26,250	B
18.	G St	South of Olive	Arterial	4	36,000	25,950	B	Arterial	4	36,000	32,150	D	33,000	D
19.	M St	North of 23rd	Arterial	4	36,000	18,350	A	Arterial	4	36,000	17,850	A	19,250	A
20.	M St	South of 23rd	Arterial	4	36,000	17,500	A	Arterial	4	36,000	16,000	A	17,600	A
21.	SR-59	South of Bellevue	Arterial	2	18,000	6,000	A	Arterial	2	18,000	8,500	A	8,550	A
22.	SR-59	South of Cardella	Arterial	2	18,000	8,100	A	Arterial	2	18,000	12,700	B	13,600	C
23.	SR-59	South of Yosemite Ave	Arterial	2	18,000	12,750	B	Arterial	2	18,000	19,800	**E/F**	20,450	**E/F**
24	SR-59	16th St. to W. Olive	Arterial	2	18,000	16,600	D	Arterial	4	36,000	34,500	D	35,200	D

No.	Roadway Segment	Location	Existing					2030						
			Facility Type	Number of Lanes	Capacity	Volume (2008)	LOS	Facility Type	Number of Lanes	Capacity	No Project		With Project	
											Volume	LOS	Volume	LOS
25.	Cardella Road	East of SR 59	Collector	4	24,000	250	A	Arterial	4	36,000	950	A	2,000	A
26.	Cardella Road	G St. to Lake/ Campus Pkwy	Collector	4	24,000	100	A	Arterial	4	36,000	4,200	A	16,250	A
27.	16th St	West of SR-59	Arterial	4	36,000	20,400	A	Arterial	4	36,000	28,700	C	27,700	C
28.	Kibby	South of Yosemite Ave	County Road	2	21,600	1,250	A	County Road	2	21,600	1,700	A	8,550	A
29.	Kibby	North of Yosemite Pkwy	County Road	2	21,600	1,950	A	County Road	2	21,600	5,200	A	12,650	A
30.	N. Parsons Ave	E. Olive to E. Yosemite	Collector	2	12,000	5,600	A	Collecto r	2	12,000	11,550	D	13,600	**E/F**
31.	N. Parsons Ave	E. of Olive to Santa Fe	Collector	2	12,000	3,900	A	Collecto r	2	12,000	12,100	**E/F**	13,300	**E/F**
32.	Bellevue Road	Lake/Campus Pkwy to G St	Collector	2	12,000	3,700	A	Arterial	6	54,000	9,900	A	20,300	A
33.	Bellevue Road	G Street to SR 59	Collector	2	12,000	1,800	A	Arterial	6	54,000	12,850	A	14,700	A
34	Bellevue Road	West of SR-59	Collector	2	12,000	2,650	A	Collecto r	2	12,000	6,950	A	7,700	B
35.	SR 140	West of Massasso	Collector	2	12,000	4,850	A	Highwa y	2	43,200	9,500	A	10,000	A
36.	SR-99	North of 16th St	Freeway	4	96,000	56,000	A	Freewa y	4	96,000	71,350	B	71,300	B
37.	SR-99	North of M St	Freeway	4	96,000	52,000	A	Freewa y	4	96,000	66,400	B	66,250	B

No.	Roadway Segment	Location	Existing					2030						
			Facility Type	Number of Lanes	Capacity	Volume (2008)	LOS	Facility Type	Number of Lanes	Capacity	No Project		With Project	
											Volume	LOS	Volume	LOS
38.	SR-99	South of Yosemite Pkwy	Freeway	4	96,000	40,000	A	Freeway	4	96,000	48,350	A	49,900	A
39.	SR-99	South of Mission Ave	Freeway	4	96,000	41,500	A	Freeway	4	96,000	58,350	B	57,650	B
40.	Campus Parkway	South of Yosemite Ave	Does not Exist					Expressway	4	62,500	23,650	A	30,550	A
41.	Campus Parkway	South of Olive Ave	Does not Exist					Expressway	4	62,500	26,150	A	29,800	A
42.	Cardella Road[2]	G St. to M St	Collector	2	12,000	300	A	Arterial	4	36,000	11,600	A	18,300	A
43.	R Street	W. Yosemite to Bellevue	Does not Exist					Arterial	4	36,000	25,250	B	25,300	B
44.	N. Parsons/ Gardner	E. Yosemite to Bellevue	Does no Exist					Arterial	4	36,000	11,300	A	23,550	B

1. Fro the 2030 case, these segments extend to Campus Parkway
2. Segment 42: Existing Volume estimated
***Bold** = Roadway segment at or near capacity*
Dark Shaded = project impact based on over-capacity projection
Light Shaded = project impact based on > 1 percent project traffic contribution to a roadway with a planned improvement project.
Source: Fehr & Peers, October 2008.

Roadway Segments

As described above, the version of the MCAG travel demand model consistent with the 2007 Merced County Regional Transportation Plan (RTP) was used to generate 2030 traffic forecasts for the Proposed Action and all project alternatives. That model assumes that a number of transportation improvements would be in place by 2030. With those transportation improvements included in the model and the assumption that the improved road network would be in place in 2030, a roadway segment level of service (LOS) analysis was conducted for the Proposed Action which revealed that the traffic resulting from the Proposed Action would result in no LOS impacts on roadway segments within the study area. Although analytically this evaluation and its results are correct, it does not reveal the full impact of the Proposed Action on the roadway segments because the analysis assumed that all necessary improvements would be built by the time that the full traffic from the Proposed Action is added to the study roadway segments.

To demonstrate the Proposed Action's impact on the basis of roadway segment LOS, a second significance criterion is used. According to this criterion, the traffic added by the Proposed Action or an alternative would be considered substantial relative to the roadway capacity and would therefore be considered to result in a significant impact on the roadway segment if it were to contribute 1 percent or more to the total projected traffic on a roadway segment for which there is a planned widening project or new connection reflected in the 2030 MCAG Travel Demand Model that is not fully funded.

Based on this criterion, the analysis found that the Proposed Action would contribute 1 percent or more to the total future traffic projected on the roadway segments listed below, all of which are planned to be widened or extended in the future and were assumed to be in place in the 2030 travel demand modeling. They are either (1) Tier 1 projects, in the Regional Transportation Plan, or (2) programmed in the 2007 RTP to be constructed through the use of non Regional Improvement Program funds, i.e., developer fees, local agency funds, Caltrans Interregional Improvement Program funds, and/or other sources. None of the improvement projects are fully funded. The project traffic contribution is considered a significant impact on these roadway segments. **Table 4.13-9, Roadway Segment Impact Summary – Proposed Action (2030)** lists the impact locations, the planned roadway improvement project for each location, and the currently identified funding source(s) for each improvements project. **Figure 4.13-16, Roadway Segment and Intersection Impact Locations (Proposed Action),** shows the roadway segments that would be significantly affected. **Table 4.13-10, Project Contribution to Significantly Affected Roadway Segments and Intersections,** at the end of this section provides the proportional contribution to the

traffic growth on each segment for the Campus, Community North, and Community South. The affected roadways include the following:

- 1.A. Campus Parkway, Cardella Road to Bellevue Road
- 2.A. Campus Parkway, E. Yosemite Avenue to Cardella Road
- 5. West Yosemite Avenue, Highway 59 to R Street
- 7. E. Yosemite Avenue, N. Parsons Avenue to Campus Parkway
- 10. Yosemite Parkway, Santa Fe Avenue to South Parsons Avenue
- 11. Yosemite Parkway, Santa Fe to Campus Parkway
- 15. G Street, Cardella Road to Bellevue Road
- 16. G Street, Yosemite Avenue to Cardella Road
- 25. Cardella Road, Highway 59 to M Street
- 26. Cardella Road, G Street to Campus Parkway
- 32. Bellevue Road, Campus Parkway to G Street
- 33. Bellevue Road, G Street to Highway 59
- 34. Bellevue Road, West of Highway 59
- 40. Campus Parkway, E. Yosemite Avenue to E. Olive Avenue
- 41. Campus Parkway, E. Olive Avenue to Highway 99
- 42. Cardella Road, G Street to M Street
- 43. R Street, W. Yosemite Avenue to Bellevue Road
- 44. N. Parsons Avenue/Gardner Avenue, E. Yosemite Avenue to Bellevue Road

Note that Campus Parkway between Yosemite Avenue and Bellevue Road is projected to operate acceptably, with four through lanes and the intersection spacing and control/lane configuration shown in **Figure 4.13-15**.

SOURCE: Fehr & Peers - October 2008

FIGURE 4.13-16

Intersection and Roadway Segment Impact Locations (Proposed Action)

Table 4.13-9
Roadway Segment Impact Summary – Proposed Action (2030)

Roadway	Segment	Planned Improvement	Funding Source [1]
1. Campus Pkwy	Cardella to Bellevue	New Facility	Development fees, local agencies, Interregional Improvement Program, other sources
2. Campus Pkwy	Yosemite to Cardella	New Facility	See above
5. E. Yosemite Ave	SR-59 to R St	Widen to 4 lanes	See above
7. E. Yosemite Ave	N. Parsons to Lake/Campus Pkwy	Widen to 4 lanes	See above
10. Yosemite Pkwy	West of Santa Fe	Widen to 4 lanes	RTP Tier 2
11. Yosemite Pkwy	East of Santa Fe	Widen to 4 lanes	RTP Tier 2
15. G Street	Cardella to Bellevue	Widen to 4 lanes	Development fees, local agencies, Interregional Improvement Program, other sources
16. G Street	E. Yosemite to Cardella	Widen to 4 lanes	See above
25. Cardella	SR-59 to M St	Extension of Existing Roadway	Development fees, local agencies, Interregional Improvement Program, other sources
26. Cardella	G St. to Campus Pkwy	Extension of Existing Roadway	See above
32. Bellevue	Lake to G St.	Widen 2 to 6 lanes	See above
33. Bellevue	G St. to SR-59	Widen 2 to 6 lanes	See above
34. Bellevue	West of SR-59	Merced-Atwater Expressway	RTP Tier 1
40. Campus Pkwy	E. Yosemite to E. Olive	New Facility	RTP Tier 1
41. Campus Pkwy	E. Olive to SR-99	New Facility	RTP Tier 1
42. Cardella Rd.	G St. to M St.	Widening of Existing Roadway	Development fees, local agencies, Interregional Improvement Program, other sources
43. R Street	W. Yosemite to Bellevue	Extension/widening of Existing Roadway	See above
44. N. Parsons/Gardner	E. Yosemite to Bellevue	Extension/widening of Existing Roadway	See above

Table 4.13-10
Project Contribution to Significantly Affected Roadway Segments and Intersections

Roadway Segment/Intersection	Location	2030 With Project Scenario				2030 With Project Plus Merced Atwater Expressway Scenario			
		% Campus	% Comm. North	% Comm. South	% Other	% Campus	% Comm. North	% Comm. South	% Other
Roadway Segments									
1. Campus Pkwy	Cardella to Bellevue	32%	28%	5%	35%	33%	28%	5%	34%
2. Campus Pkwy	Yosemite to Cardella	17%	28%	10%	45%	17%	29%	10%	44%
5. E. Yosemite Ave	SR-59 to R St	2%	4%	2%	92%	2%	3%	2%	93%
7. E. Yosemite Pkwy	N. Parsons to Campus Pkwy	2%	4%	13%	81%	2%	4%	17%	77%
10. Yosemite Pkwy	West of Santa Fe	8%	14%	12%	67%	9%	16%	13%	62%
11. G Street	East of Santa Fe	7%	12%	10%	71%	7%	13%	11%	69%
15. G Street	Cardella	1%	3%	3%	94%	<1%	4%	3%	93%
16. G Street	E. Yosemite to Cardella	2%	3%	2%	93%	2%	4%	2%	92%
25. Cardella Road	SR59 to M St	3%	6%	2%	89%	3%	7%	3%	87%
26. Cardella Road	G St to Campus Pkwy	11%	24%	8%	57%	1%	25%	9%	5%
32. Bellevue Road	Campus Pkwy to G St.	27%	28%	5%	40%	28%	29%	5%	38%
33. Bellevue Road	G St. to SR 59	2%	3%	<1%	95%	3%	4%	1%	92%
34. Bellevue Road	West of SR-59	3%	3%	<1%	94%	3%	4%	<1%	93%
40. Campus Pkwy	E. Yosemite to E. Olive	11%	19%	9%	61%	12%	20%	1%	57%
42. Campus Pkwy	E. Olive to SR 99	9%	15%	6%	70%	10%	16%	7%	67%
42. Cardella Rd	Between G St. and M St.	8%	18%	6%	68%	9%	19%	6%	6%
43. R Street	W. Yosemite to Bellevue	2%	3%	1%	94%	1%	2%	1%	96%
44. N. Parsons/ Gardner	E. Yosemite to Bellevue	10%	16%	4%	70%	11%	16%	3%	70%

Roadway Segment/Intersection	Location	2030 With Project Scenario				2030 With Project Plus Merced Atwater Expressway Scenario			
		% Campus	% Comm. North	% Comm. South	% Other	% Campus	% Comm. North	% Comm. South	% Other
Study Intersections									
1. Highway 59/Bellevue	N/A	1%	1%	0%	98%	2%	2%	1%	95%
14. R Street/W. Olive	N/A	4%	7%	4%	84%	3%	6%	4%	87%
33. G Street/14th Street/SR 99 NB off-ramp	N/A	3%	5%	2%	91%	3%	5%	2%	91%

Source: Fehr & Peers 2008

Table 4.13-10, Project Contribution to Significantly Affected Roadway Segments and Intersections, provides the proportional contribution to the traffic growth on each segment, for the Campus, Community North, and Community South, based on MCAG travel demand model forecasts prepared for this analysis.

Intersections

The addition of project traffic would cause the following intersections to operate poorly under 2030 conditions:

Intersection 1, Bellevue Road and Highway 59. As shown in **Table 4.13-8**, the addition of traffic from the Proposed Action would cause the operation of the intersection of Bellevue Road and Highway 59 to deteriorate from LOS D and C in the AM and PM peak hours respectively to LOS F and E. This is considered a significant impact.

Intersection 14, West Olive Avenue and R Street. As shown in **Table 4.13-8**, the intersection of R Street and Olive Avenue is projected to operate at a LOS F in the PM peak hour under Future No Project conditions. The traffic added by the Proposed Action would cause the operation of this intersection to worsen as the project-related traffic would increase the delay at this intersection from 88 seconds to 95 seconds, an increase greater than the threshold of 5 seconds at an intersection that would be operating at an unacceptable LOS. This is considered a significant impact of the Proposed Action.

Intersection 33, 14th Street and G Street at Highway 99 Northbound Off-Ramp. As shown in **Table 4.13-8,** the intersection of G Street and the Highway 99 northbound off-ramp at 14th Street is projected to operate at LOS D in the AM and PM peak hours under Future No Project conditions. The traffic added by the Proposed Action would cause the operation of this intersection to deteriorate from LOS D to LOS E in the AM and PM peak hours. This is considered a significant impact.

Two other signalized intersections (Intersection 15, Olive Avenue & M Street; Intersection 28, West 16th Street and V Street) are predicted to operate at LOS E or LOS F under the Future No Project condition; however, addition of project traffic would not increase the delay at these intersections by more than 5 seconds and therefore, would not result in a significant impact based on the thresholds of significance.

Future intersections along the Campus Parkway between Yosemite Avenue and Bellevue Road were analyzed with the lane geometries that would be required to assure acceptable operation under 2030 with Proposed Action conditions. These geometries are shown in **Figure 4.13-16**. The contribution of the Campus, Community North, and Community South to the future traffic at these intersections is best described on a roadway segment basis, as shown above in **Table 4.13-9.**

All of the intersection impacts described above would result because the Proposed Action would contribute traffic to these intersections that would operate at unacceptable levels of service under the Future No Project conditions. Therefore these represent the cumulative effects of the Proposed Action combined with the effects of other regional growth. The following improvements would address the poor operations at each of the three intersections and would improve the LOS as discussed below and shown in **Table 4.13-11, Intersection LOS – Future Plus Project Conditions With and Without Mitigation (2030).**

Table 4.13-11
Intersection LOS – Future Plus Project Conditions With and Without Mitigation (2030)

Intersection	Mitigation	Peak Hour	Proposed Action			Proposed Action Mitigated		
			Traffic Control	Delay	LOS	Traffic Control	Delay	LOS
1. SR 59/ Bellevue	Construct 100-foot right-turn pockets for the south, north, and east approach; construct one additional eastbound through lane; lengthen the existing southbound left-turn lane to 200 feet and construct an additional southbound left-turn lane of the same length.	AM PM	Signal	116 59	**F** **E**	Signal	37 29	D C
14. R Street/West Olive	Construct a second left-turn lane of equal length to the existing left-turn lane for the northbound, eastbound and westbound approaches.	AM PM	Signal	39 95	D **F**	Signal	39 44	D D
33. G Street/SR 99 Northbound Off-ramp/14th Street	Signalize Intersection	AM PM	SSSC	38 38	**E** **E**	Signal	11 9	B A

Source: Fehr & Peers, October 2008

Improvement 1: Intersection of Bellevue Road and Highway 59. Construct 100-foot right turn pockets for the south, north, and east approach; construct one additional eastbound through lane; lengthen the existing southbound left-turn lane to 200 feet and construct an additional southbound left-turn lane of the

same length. This would improve the intersection LOS to LOS D in the AM peak hour and LOS C in the PM peak hour.

Improvement 2: Intersection of R Street and Olive Avenue. Construct a second left-turn lane of equal length to the existing left-turn lane for the northbound, eastbound, and westbound approaches. This would improve the intersection LOS to LOS D in the PM peak hour

Improvement 3: Intersection of 14th Street and G Street at the Highway 99 northbound offramp. Install a traffic signal. This would improve the intersection LOS to LOS B in AM peak hour and LOS A in the PM peak hour

Table 4.13-11 shows the LOS after the implementation of the proposed improvements. The proposed improvements would restore the intersection operations to acceptable levels. All of these improvements have been evaluated for their feasibility and have been determined by a qualified traffic engineer to be feasible. All improvements can be made within existing right-of-way and will not require acquisition of adjacent property.

None of the three affected intersections or the 18 affected roadway segments is within the jurisdiction of the University. Therefore, these improvements, as and when they are needed, would be implemented by the affected jurisdiction. The Proposed Action, including each of the three subareas that make up the Proposed Action, would provide either a proportional share of the cost of the improvement based on the project's actual contribution to the impact or would pay traffic impact fees. **Mitigation Measures TRANS-1A and -1B** are proposed below to address the Proposed Action's significant impacts on roadway segments and intersections.

MM TRANS-1A: **Campus Traffic Mitigation Program (CTMP).** The Campus Traffic Mitigation Program (CTMP) is a proposed program to monitor trip generation, reduce peak-hour trips, and/or participate in roadway improvements to mitigate off-site impacts associated with the roadway segments and intersections affected by the development of the Campus. CEQA provides that an agency can mitigate its contribution to local and regional environmental impacts by contributing its proportional share of funding to mitigation measures designed to alleviate the identified impact (*State CEQA Guidelines* section 15130(a)(3)). The CTMP will consist of the following elements/measures:

MM TRANS-1A-1: **Travel Demand Management.** To reduce on- and off-campus vehicle trips and resulting impacts, the University will implement a range of Transportation Demand Management (TDM) strategies. TDM strategies will include measures to

increase transit and shuttle use, encourage alternative transportation modes including bicycle transportation, implement parking polices that reduce demand, and implement other mechanisms that reduce vehicle trips to and from the campus and community. (*Applicability – Campus*)

MM TRANS-1A-2: **Transit Enhancement.** To enhance transit systems serving the Campus and University Community, the University will work cooperatively with the City of Merced, County of Merced, Cat Tracks, The Bus, StaRT, YARTS, and other local agencies to coordinate service routes with existing and proposed shuttle and transit programs. (*Applicability – Campus*)

MM TRANS-1A-3: **Sustainability and Monitoring.** The University shall review individual projects proposed under the 2009 LRDP for consistency with UC sustainable transportation policy and UCM Transportation Demand Management (TDM) strategies set forth in the 2009 LRDP to ensure that bicycle and pedestrian improvements, alternative fuel infrastructure, transit stops, and other project features that promote alternative transportation are incorporated to the extent feasible. The University shall monitor the performance of campus TDM strategies through annual surveys. (*Applicability – Campus*)

MM TRANS-1A-4: **Campus Housing.** The University will continue to pursue the implementation of affordable on-campus student housing to reduce peak-hour commuter trips to the campus. (*Applicability – Campus*)

MM TRANS-1A-5: **Campus Traffic Impact Monitoring.** The University will monitor trip generation resulting from the campus development under the 2009 LRDP to track the actual trip generation relative to the projections in this EIS/EIR. The University will conduct traffic cordon counts of the campus with each 3,000 person increase in student population, measured by three-term average headcount enrollment increases with 2007-08 as the base year. If this monitoring determines that traffic attributable to the Campus contributes to a significant traffic impact at any of the roadway segments or intersections listed in **Table 4.13-10** the University will implement measures to reduce vehicle trips contributing to the impact or provide its proportional share of funding for improvements at the impacted intersections and/or roadway segments. (*Applicability – Campus*)

MM TRANS-1A-6: **Proportional Share Determination.** At the time a significant impact is identified pursuant to the monitoring under **Mitigation Measure TRANS-1A-5**, the University's actual percent contribution to the total traffic volume at pertinent intersections and roadway segments will be calculated and used as the basis for determining the University's mitigation obligation, or proportional share of funding for the traffic improvements listed in the table. **Table 4.14-10** provides the projected percent contribution of the Campus to the total traffic volume on the roadway segment impact locations and at the intersection impact locations, respectively. The tables also show the projected contribution from the Community North and Community South. A fourth column indicates the projected contribution of traffic on the roadway segments and at the intersections attributable to all other sources. (This category includes existing traffic and growth in traffic from non-Campus, non-University Community sources). In the future, the actual contributions of campus traffic to the affected intersections and roadway segments will be calculated. (*Applicability – Campus*)

MM TRANS-1A-7: **Mitigation Payments.** The amount of the University's mitigation payments will be based on the University's proportional share of the affected jurisdiction's actual cost of the relevant traffic improvement(s) at the time of final design. The amount will be calculated by applying the University's proportional share determined in **Mitigation Measure TRANS-1A-6** to the total cost of the improvement, after accounting for all other federal and state funding sources. Funding will be internally committed by the University at the time the traffic impact is triggered pursuant to the results of monitoring under **Mitigation Measure TRANS-1A-5**. Payments will be made to the appropriate jurisdiction at the time the improvements are constructed. If improvements are constructed before the impact is triggered, the University will pay its proportional share at the time that the impact is triggered. Mitigation payments will be made after the University reviews the scope and budget of the improvement project. (*Applicability – Campus*)

MM TRANS-1A-8: **Alternate Improvements.** Feasible traffic improvements are identified in **Table 4.13-11** to mitigate the Proposed Action's significant traffic impacts to a less than significant level. As the identified improvements would be planned, designed, and implemented by the City of Merced, Merced County, or other affected jurisdictions, the final configuration of future transportation improvements may

vary from those identified in **Tables 4.13-11**. Detailed planning, environmental analysis and engineering studies for some of these improvements has not been completed; therefore, the implementing agency has not committed to all identified improvements. If any improvement described herein is found to be ineffective or infeasible, and alternative improvements are determined to be required to achieve an acceptable LOS, the University will work in collaboration with the public agency to implement alternative improvements. (*Applicability – Campus*)

MM TRANS-1B: **University Community Traffic Mitigation.** The following measures will be implemented to mitigate the traffic impacts from the development of the University Community.

MM TRANS-1B-1: To enhance transit systems serving the Campus and University Community, the affected jurisdiction will work cooperatively with Cat Tracks, The Bus, StaRT, YARTS, and other local agencies to coordinate service routes with existing and proposed shuttle and transit programs. (*Applicability – University Community*)

MM TRANS-1B-2: The City of Merced and Merced County should conduct traffic impact fee studies[3] to update their respective traffic impact fee programs and set the appropriate fees for new development to assure that the improvements identified in **Tables 4.13-11** can be funded and constructed. These fees would apply to development within the University Community, along with other development projects in the City and the County. The fees that may be adopted and applied to development projects in the University Community should be consistent with the fair share and nexus requirements of California mitigation fee law (Government Code 66000 et seq.). (*Applicability – University Community*)

MM TRANS-1B-3: The proponents of development projects in the University Community shall contribute to the improvements identified in **Tables 4.13-11** through payment of the traffic impact fees similar to other development in the Merced area. The proportional share percentages shown in **Table 4.13-10** provide an estimate, based on the current analysis, of the University Community's proportional share of total future traffic at the impact locations. The actual fees that would be

3 Alternately, MCAG may update the Regional Transportation Impact Fee Study to reflect the cost of an expanded regional improvement project list, which the City of Merced and Merced County would then adopt similar to what the City and County did in 2005.

collected by the City or County will be based on traffic impact studies completed for the development projects at the time that they are proposed. (*Applicability – University Community*)

Significance after Mitigation: The full funding and construction of the roadway segment and intersection improvements identified in the mitigation measures above cannot be assured, as it depends on actions by other jurisdictions. Therefore, **Impact TRANS-1** would remain significant and unavoidable.

Alt 1 – Impact TRANS-2: **The Proposed Action would place additional demand on local and regional transit service being deployed to connect the Campus and Community with major destinations with Merced County. (*Less than Significant*)**

Campus and University Community

The 2009 LRDP policies provide for a campus street system designed to meet the travel time and maneuvering requirements for transit vehicles, including appropriately-sized travel lanes, bus stops and pull-outs, and connectivity to key destinations. LRDP policies provide for high transit levels of service and operating efficiency, integration of regional campus transit services, and broad-based user-fee program for the campus that has demonstrated effective in other university environments. The Campus already provides bus services connecting the campus to downtown Merced, Merced College, and the Castle research facilities. Additionally, transit service to the Campus and Community is envisioned in the most recent Short-Range Transit Plan by Merced County Transit. Implementation of **Mitigation Measure TRANS-1A** would provide for continued support for transit services as the campus grows. The LRDP policies and **Mitigation Measures TRANS-1A** and **TRANS-1B** combined with the County's commitment to support transit service to the Campus and Community would reduce this impact to a less-than-significant level.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact TRANS-3: **The Proposed Action would generate pedestrian and bicycle travel in higher concentrations and amounts than found in many other parts of the County. (*Less than Significant*)**

Campus and University Community

Access to the campus for pedestrians and bicyclists is currently served via a pedestrian/bicycle path running north-south east of Lake Road, south of the campus, and via Bellevue Road, which currently has

no bike lanes or pedestrian facilities, to the west of the campus. The Lake Road bicycle path may need to be re-located to the east of Campus Parkway when it is built, or other measures to allow pedestrians and bicyclists to efficiently and safely cross the parkway should be provided.

LRDP policies provide for ongoing coordination with neighboring jurisdictions and regional agencies to manage traffic growth and coordinate timely implementation of bicycle and pedestrian systems and services. The policies contained in the Merced County Regional Commuter Bicycle Plan and in the Merced and Atwater Bicycle Plan also support the improvements of bikeway connections to the Campus and Community. Implementation of these plans and the LRDP policies would reduce this impact to a less-than-significant level.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact TRANS-4: The Campus would not generate off-site "spillover" parking that would affect nearby areas. (*Less than Significant*)

Campus

UC Merced envisions providing a parking supply to meet campus demand at a targeted 90 percent peak occupancy level. This is a standard peak occupancy target for large users. The actual timing of the construction of new parking as the campus develops beyond its current size will depend on careful monitoring of actual parking occupancy levels and corresponding demand estimates. LRDP policies provides for development of parking supply/demand Master Plan for the campus, and provide for effective management of parking supply to meet changing demand. Other LRDP policies define parking enforcement to prevent unacceptable impacts of major generators on sensitive adjoining uses and define parking demand management measures. Policies also offer alternative mode incentives and provide options to reduce driving and parking. The campus developed to date does not generate off-site parking demand, indicating that these parking management strategies are working. Therefore, implementation of the LRDP policies would reduce this impact to a less-than-significant level.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact TRANS-5: **The Campus and University Community road network system would be adequately sized and designed to facilitate emergency access vehicles. (*Less than Significant*)**

Campus and University Community

The proposed Campus and Community circulation system would be designed to minimize reliance on vehicles while maintaining high levels of accessibility and personal mobility. Streets within the Campus and Community would be designed to accommodate a mix of travel modes. Residential areas, within the community, would be protected by integrating traffic calming features into the street design to control volumes and speeds on local streets.

Implementation of the 2009 LRDP and UCP policies would ensure the street system would provide adequate connectivity and capacity, and would be implemented in a timely manner relative to the pace of development. The Campus and University Community street system would be adequately designed to accommodate the traffic demand and would be appropriately sized to support access by emergency response vehicles. Implementation of the policies that require these design measures would reduce this impact to a less-than-significant level.

Mitigation Measure: No mitigation is required.

4.13.6.2 Alternative 2 – Yosemite Avenue

Alternative 2 is identical to Alternative 1, Proposed Action, in terms of the size of Campus and University Community population and is also approximately the same distance from the City of Merced and Lake Yosemite Regional Park as the Proposed Action. The Yosemite Avenue Alternative shifts the proposed campus and University Community south such that it results in Community South being shifted to the south of Yosemite Avenue.

The trip generation for this alternative is identical to the Proposed Action trip generation. The trips traveling external to the site were assigned using the MCAG Travel Demand Model, with the traffic analysis zones for the Campus located east of Campus Parkway and north of Cardella; the traffic analysis zones for the North Community being located east of Campus Parkway and south of Cardella; and the traffic analysis zones for the South Community being located east of Campus Parkway and south of Yosemite Avenue. The relocation of the South Community necessitated relocating new uses already assumed in the MCAG Travel Demand Model for that area to other parts of the model. In sum, 199 residential units (77 single-family, 122 multi-family) from the area generally bounded by Yosemite Avenue on the north, Olive Avenue on the south, Lake Road on the west, and Orchard Drive on the east,

were relocated to Bellevue Ranch development straddling Bellevue Road between Highway 59 and G Street.

Roadway Segment Impacts

Table 4.13-12, Roadway LOS Summary – All Alternatives - Future Conditions (2030), shows the roadway LOS results for the Yosemite Avenue Alternative, along with the results for all of the alternatives. As shown in **Table 4.13-12**, implementation of this alternative would not cause any of the road segments to operate over capacity.

Table 4.13-12, also shows the roadway segments, where this alternative would add 1 percent or more to the traffic growth on planned roadway segment that would be widened or expanded in the future. This alternative would impact 17 of the 18 road segments identified above for the Proposed Action.

Intersection Impacts

Table 4.13-13, Intersection LOS Summary – All Alternatives - Future Conditions (2030), shows the intersection LOS results for the Yosemite Avenue Alternative, along with the results for all of the alternatives. As indicated by the shaded entries in **Table 4.13-13**, the Yosemite Avenue Alternative would result in a significant impact to Intersection 33, G Street/SR 99 Off-ramp/14th Street, during both AM and PM peak hours.

This impact is similar to that of the Proposed Action. The Yosemite Avenue Alternative would not impact two other intersections that are affected by the Proposed Action – intersections 1 (Bellevue Road/SR 59) and 14 (Olive Avenue/R Street).

The mitigation for the intersection impacts are given in **Table 4.13-14, Intersection Impact and Mitigation Summary – Future Conditions (2030)**. In this case, the mitigation for Intersection 33 is to signalize the intersection (same as **the improvement** for the Proposed Action). Additionally, the above-mentioned impact would be mitigated by **Mitigation Measures TRANS-1A** and **TRANS-1B.** However, implementation of the needed improvement cannot be assured, as it depends on actions by other jurisdictions and thus the impact would remain **significant and unavoidable**.

4.13.6.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch Alternative relocates the Campus and University Community uses to about 2,800 acres of land straddling Bellevue Road between SR 59 and G Street, to the west and north of the Proposed Action project site.

The trip generation for this alternative is identical to the Proposed Action trip generation. The trips traveling external to the site were assigned using the MCAG Travel Demand Model, with the traffic analysis zones for the Campus, Community North and Community South located in the sub-areas shown in the site plan. The relocation of the uses to these areas necessitated relocating new uses already assumed in the MCAG Travel Demand Model for the areas to other parts of the model. The specific displaced uses are part of the planned Bellevue Ranch development, including:

- 6,807 Single-family units
- 2,148 Multi-family units
- 646 Industrial jobs
- 2,284 Retail jobs
- 9,807 Office jobs

All of the displaced uses were assigned to the Castle Farms area, north of Bellevue Road and west of SR-59.

Roadway Segment Impacts

Table 4.13-12 shows the roadway LOS results for the Bellevue Ranch Alternative, along with the results for all of the alternatives. As indicated by the shaded entries in **Table 4-13-12**, the Bellevue Ranch Alternative would cause roadway segment 33, Bellevue Road West of Highway 59 to exceed its capacity. This is considered a significant impact, which can be mitigated by the construction of the northern segment of the Merced-Atwater Expressway.

Table 4.13-12, also shows the roadway segments where this alternative would add 1 percent or more to the traffic growth on planned roadway segment that would be widened or expanded in the future. This alternative would impact the same 18 road segments identified above for the Proposed Action.

Intersection Impacts

Table 4.13-13 shows the intersection LOS results for the Bellevue Ranch Alternative, along with the results for all of the alternatives. As indicated by the shaded entries in **Table 4.13-13**, the Bellevue Ranch Alternative would result in a significant impact at two intersections, which would also be significantly affected by the Proposed Action:

- Intersection 1 – Bellevue Road/Highway 59 during AM and PM peak hours
- Intersection 33, G Street/SR 99 Off-ramp/14th Street, during both AM and PM peak hours

Table 4.13-12
Roadway LOS Summary – All Alternatives - Future Conditions (2030)

No.	Roadway Segment	Location	2030													
					Proposed Action		Proposed Actn. + Expwy[1]		2002 Project		Yosemite		Bellevue		No Action		No Build	
			Facility Type	Number of Lanes	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
1A	Campus Pkwy.	South of Bellevue	Arterial	4	19,750	A	18,900	A	20,650	A	21,500	A	19,750	A	14,850	A	8,050	A
2A	Campus Pkwy.	South of Cardella	Arterial	4	31,000	D	30,000	C	30,200	C	29,350	C	29,400	C	27,300	C	24,300	B
3	McKee Rd.	South of Yosemite	Arterial	2	14,150	C	12,550	B	13,950	C	13,950	C	12,500	B	12,900	B	11,900	B
4	McKee Rd.	South of Olive	Arterial	2	17,300	D	16,000	D	16,900	D	16,850	D	17,600	D	16,700	D	16,550	D
5	W. Yosemite Ave.	SR 59 to G St.	Arterial	4	13,350	A	14,750	A	13,750	A	13,500	A	14,950	A	14,550	A	13,450	A
6	E. Yosemite Ave.	G St. to N. Parsons	Arterial	4	27,750	C	25,600	B	27,350	C	26,850	B	24,650	B	27,100	C	21,850	B
7	E. Yosemite Ave.	N. Parsons to Campus Parkway	Collector	4	17,500	B	14,100	A	16,300	B	17,750	B	11,050	A	14,200	A	8,450	A
8	E. Yosemite Ave.	Between Lake and Kibby	County Road	2	18,950	D	15,900	B	18,600	D	20,200	D	15,750	B	17,350	C	10,900	A
9	E. Yosemite Ave.	East of Kibby	County Road	2	11,700	A	11,050	A	12,000	A	11,950	A	12,850	A	10,550	A	10,150	A
10	Yosemite Pkwy.	West of Santa Fe Ave.	Arterial	4	14,550	A	11,800	A	13,250	A	14,250	A	10,150	A	12,150	A	8,350	A
11	Yosemite Pkwy.	East of Santa Fe Ave.	Highway	4	16,800	A	14,200	A	15,400	A	16,600	A	11,850	A	13,900	A	10,250	A
12	Olive Ave.	East of SR 59	Arterial	6	43,850	C	43,900	C	43,350	C	43,400	C	44,350	C	42,850	C	43,150	C
13	Olive Ave.	West of G St.	Arterial	6	38,300	B	36,850	B	38,400	B	36,450	B	41,300	C	36,400	B	35,350	B
14	Olive Ave.	East of G St.	Arterial	4	25,350	B	25,100	B	25,450	B	25,600	B	25,700	B	25,400	B	24,700	B
15	G St.	South of Bellevue	Arterial	4	20,950	A	20,400	A	19,350	A	20,000	A	22,350	B	19,200	A	19,050	A
16	G St.	South of Cardella	Arterial	4	18,550	A	18,100	A	18,300	A	17,050	A	18,700	A	16,250	A	15,150	A
17	G St.	South of Yosemite Ave.	Arterial	4	26,250	B	25,250	B	26,200	B	25,550	B	26,100	B	25,450	B	24,400	B
18	G St.	South of Olive	Arterial	4	33,000	D	32,150	D	33,900	D	32,450	D	33,950	D	32,250	D	32,150	D
19	M St.	North of 23rd	Arterial	4	19,250	A	18,950	A	18,850	A	19,100	A	21,500	A	18,650	A	17,850	A
20	M St.	South of 23rd	Arterial	4	17,600	A	16,600	A	17,100	A	17,350	A	19,150	A	16,850	A	16,000	A
21	SR-59	South of Bellevue	Arterial	2	8,550	A	8,500	A	8,300	A	8,400	A	12,100	B	8,500	A	8,500	A
22	SR-59	South of Cardella	Arterial	2	13,600	C	11,900	B	13,000	B	13,350	B	15,850	D	13,150	B	12,700	B
23	SR-59	South of Yosemite	Arterial	2	***20,450***	***E/F***	***19,800***	***E/F***	***20,300***	***E/F***	***20,150***	***E/F***	***22,250***	***E/F***	***20,250***	***E/F***	***19,800***	***E/F***
24	SR-59	South of Olive	Arterial	4	35,200	D	33,700	D	34,850	D	34,950	D	***38,550***	***E/F***	34,850	D	34,500	D
25	Cardella Rd.	Between SR-59 and M St.	Arterial	4	2,000	A	1,900	A	1,800	A	1,700	A	2,600	A	1,250	A	950	A
26	Cardella Rd.	Between G St. and Campus Pkwy.	Arterial	4	16,250	A	17,150	A	16,450	A	15,050	A	10,150	A	10,600	A	4,200	A
27	16th St.	West of SR-59	Arterial	4	27,700	C	25,900	B	27,400	C	28,000	C	29,750	C	27,550	C	28,700	C
28	Kibby Rd.	South of Yosemite Ave.	County Road	2	8,550	A	5,750	A	7,850	A	9,600	A	3,850	A	7,850	A	1,700	A
29	Kibby Rd.	North of Yosemite Pkwy.	County Road	2	12,650	A	7,950	A	12,400	A	14,050	B	8,800	A	10,850	A	5,200	A
30	N. Parsons	E. Olive to Yosemite	Collector	2	***13,600***	***E/F***	***12,300***	***E/F***	***12,850***	***E/F***	***13,450***	***E/F***	11,950	D	***12,450***	***E/F***	11,550	D
31	N. Parsons	Santa Fe to E. Olive	Collector	2	***13,300***	***E/F***	***12,700***	***E/F***	***12,350***	***E/F***	***13,150***	***E/F***	***13,000***	***E/F***	***12,450***	***E/F***	***12,100***	***E/F***
32	Bellevue	Campus Parkway to G St.	Arterial	6	20,300	A	19,400	A	19,750	A	19,450	A	19,150	A	14,700	A	9,900	A

No.	Roadway Segment	Location	2030													
			Facility Type	Number of Lanes	Proposed Action		Proposed Actn. + Expwy[1]		2002 Project		Yosemite		Bellevue		No Action		No Build	
					Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS	Volume	LOS
33	Bellevue	G St. to SR-59	Arterial	6	14,700	A	20,800	A	13,450	A	15,050	A	24,250	A	13,350	A	12,850	A
34	Bellevue	West of SR-59	Collector	2[2]	7,700	B	20,350	A*	7,700	B	7,800	B	***25,650***	***E/F***	7,400	B	6,950	A
35	SR-140	West of Massasso	Highway	2	10,000	A	9,250	A	9,800	A	10,150	A	10,950	A	9,750	A	9,500	A
36	SR-99	North of 16th St.	Freeway	4	71,300	B	67,500	B	71,550	B	70,800	B	77,050	C	70,750	B	71,350	B
37	SR-99	North of M St.	Freeway	4	66,250	B	64,250	B	66,850	B	66,050	B	73,350	C	66,450	B	66,400	B
38	SR-99	South of Yosemite Pkwy.	Freeway	4	49,900	A	47,900	A	49,350	A	48,250	A	51,550	A	47,950	A	48,350	A
39	SR-99	South of Mission Ave.	Freeway	4	57,650	B	59,200	B	56,400	A	57,200	A	57,650	B	57,200	A	58,350	B
40	Campus Pkwy.	E. Yosemite to E. Olive	Expressway	4	30,550	A	29,050	A	39,750	B	29,750	A	26,650	A	27,800	A	23,650	A
41	Campus Pkwy.	E. Olive to SR-99	Expressway	4	29,800	A	29,700	A	39,300	B	29,400	A	29,200	A	27,750	A	26,150	A
42	Cardella Rd.	M St. to G St.	Arterial	4	18,300	A	18,950	A	16,900	A	16,850	A	22,050	A	13,850	A	11,600	A
43	R St.	W. Yosemite to Bellevue	Arterial	4	25,300	B	24,100	B	25,700	B	25,200	B	29,850	C	25,100	B	25,250	B
44	N. Parsons /Gardner	E. Yosemite to Bellevue	Arterial	4	23,550	B	17,800	A	20,950	A	21,700	B	11,450	A	15,350	A	11,300	A

Source: Fehr & Peers, October 2008

[1] *Full Title Proposed Action With Merced Atwater Expressway*

[2] *Segment 34 (Bellevue west of SR 59 has 6 lanes for Proposed Action Alternative + Merced Atwater Expressway*

Dark shading *= project impact based on over-capacity projection*

Light shading *= project impact based on >1% project contribution to a roadway with a planned improvement project that is not fully funded*

Table 4.13-13
Intersection LOS Summary – All Alternatives - Future Conditions (2030)

Int. No.	Intersection	Control	Period	No Build		No Action		Proposed Action		Proposed Actn+Expwy[2]		2002 Project		Bellevue		Yosemite	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Snelling Hwy. (SR 59) and Bellevue	Signal	AM	45	D	46	D	*>80*	*F*	*65*	*E*	47	D	*>80*	*F*	51	D
			PM	33	C	37	D	*59*	*E*	*60*	*E*	34	C	*>80*	*F*	34	C
2	Parsons and Yosemite Ave.	Signal	AM	23	C	29	C	31	C	35	C	30	C	31	C	41	D
			PM	25	C	26	C	28	C	28	C	28	C	25	C	27	C
3	Lake and Bellevue	DOES NOT EXIST															
4	Snelling Hwy. (SR 59) and Cardella	Signal	AM	17	B	16	B	48	D	19	B	19	B	14	B	16	B
			PM	14	B	15	B	25	C	16	B	15	B	15	B	15	B
5	G St and Cardella	Signal	AM	31	C	32	C	52	D	60	E	48	D	34	C	41	D
			PM	23	C	29	C	39	D	43	D	35	C	25	C	35	D
6	Lake and Cardella	DOES NOT EXIST															
7	Snelling Hwy. (SR 59) and Yosemite Ave.	Signal	AM	14	B	14	B	15	B	14	B	14	B	15	B	14	B
			PM	15	B	16	B	16	B	13	B	16	B	13	B	16	B
8	G St and Yosemite Ave.	Signal	AM	32	C	33	C	34	C	33	C	33	C	32	C	34	C
			PM	27	C	28	C	29	C	29	C	29	C	27	C	30	C
9	Parsons and Yosemite Ave.	Signal	AM	17	B	21	C	24	C	18	B	26	C	18	B	27	C
			PM	15	B	19	B	22	C	16	B	20	B	16	B	21	C
10	McKee and Yosemite Ave.	Signal	AM	18	B	18	B	27	C	17	B	19	B	17	B	22	C
			PM	21	C	21	C	23	C	16	B	21	C	19	B	21	C
11	Lake and Yosemite Ave.	Signal	AM	6	A	7	A	6	A	6	A	6	A	7	A	6	A
			PM	6	A	6	A	6	A	6	A	6	A	6	A	6	A
12	Kibby and Yosemite Ave.	Signal	AM	7	A	28	C	32	C	16	B	35	C	19	B	30	C
			PM	5	A	29	C	33	C	21	C	24	C	22	C	33	C
13	Snelling Hwy. (SR 59) and Olive	Signal	AM	48	D	48	D	48	D	44	D	47	D	52	D	48	D
			PM	44	D	44	D	44	D	43	D	44	D	49	D	44	D
14	R St and Olive	Signal	AM	37	D	40	D	39	D	36	D	39	D	36	D	39	D
			PM	*88*	*F*	*>80*	*F*	*95*	*F*	*91*	*F*	*>93*	*F*	*88*	*F*	*92*	*F*
15	M St and Olive	Signal	AM	57	E	37	D	58	E	53	D	44	D	37	D	42	D
			PM	*83*	*F*	*>80*	*F*	*>80*	*F*	*68*	*E*	*>80*	*F*	*74*	*E*	*60*	*E*
16	G St and Olive	Signal	AM	34	C	40	D	34	C	36	D	39	D	32	C	37	D
			PM	45	D	50	D	51	D	52	D	51	D	51	D	50	D
17	Parsons and Olive	Signal	AM	30	C	29	C	30	C	36	D	34	C	33	C	30	C
			PM	26	C	38	D	31	C	37	D	30	C	36	D	36	D
18	McKee and Olive	Signal	AM	31	C	29	C	37	D	37	D	32	C	25	C	31	C
			PM	33	C	32	C	40	D	29	C	38	D	26	C	30	C
19	Kibby and Olive	AWS	AM	8	A	8	A	11	B	8	A	10	A	8	A	12	B
			PM	8	A	8	A	9	A	8	A	8	A	8	A	12	B

Int. No.	Intersection	Control	Period	No Build		No Action		Proposed Action		Proposed Actn+Expwy[2]		2002 Project		Bellevue		Yosemite	
				Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
20	Southern Pacific Ave and 16th St-SR-99 SB Ramps	SSSC	AM	21	C	20	C	21	C	19	C	21	C	23	C	20	C
			PM	20	C	19	C	20	C	18	C	19	C	21	C	19	C
21	Snelling Hwy. (SR 59) and 16th St.	Signal	AM	32	C	31	C	32	C	31	C	32	C	41	D	31	C
			PM	28	C	29	C	28	C	30	C	28	C	27	C	28	C
22	Santa Fe and McKee	Signal	AM	10	A	11	B	10	A	11	B	14	B	14	B	13	B
			PM	9	A	11	B	9	A	9	A	12	B	9	A	9	A
23	Santa Fe and Yosemite Pkwy.	Signal	AM	12	B	12	B	12	B	12	B	17	B	12	B	16	B
			PM	11	B	18	B	11	B	11	B	12	B	11	B	11	B
24	Lake and Bellevue	Signal	AM	12	B	15	B	19	B	23	C	16	B	15	B	19	B
			PM	19	B	14	B	22	C	22	C	12	B	21	C	15	B
25	Yosemite Pkwy and SR 99 NB Ramps	Signal	AM	18	B	18	B	19	B	19	B	18	B	21	C	18	B
			PM	18	B	22	C	18	B	22	C	18	B	22	C	23	C
26	Mission Ave and SR 99 SB Ramps	Signal	AM	6	A	10	A	19	B	16	B	14	B	9	A	24	C
			PM	11	B	11	B	12	B	10	A	13	B	14	B	11	B
27	Mission Ave and SR 99 NB Ramps	Signal	AM	26	C	26	C	36	D	26	C	39	D	26	C	37	D
			PM	15	B	16	B	17	B	20	B	15	B	14	B	16	B
28	V St and 16th St.	Signal	AM	47	D	47	D	47	D	47	D	47	D	45	D	47	D
			PM	***65***	***E***	***65***	***E***	***67***	***E***	***65***	***E***	***67***	***E***	***67***	***E***	***65***	***E***
29	16th St and R St.	Signal	AM	28	C	28	C	29	C	28	C	28	C	25	C	28	C
			PM	34	C	33	C	34	C	33	C	34	C	33	C	33	C
30	Martin Luther King Jr. Way and SR-99 NB Ramps	Signal	AM	8	A	8	A	8	A	8	A	8	A	8	A	8	A
			PM	9	A	9	A	9	A	9	A	9	A	9	A	9	A
31	Kibby and Yosemite Pkwy.	SSSC	AM	25	C	25	C	25	C	25	C	25	C	25	C	25	C
			PM	29	D	29	D	29	D	29	D	29	D	29	D	29	D
32	Martin Luther King Jr. Way and SR-99 SB Ramps	Signal	AM	43	D	43	D	44	D	43	D	43	D	43	D	43	D
			PM	42	D	42	D	42	D	42	D	42	D	43	D	42	D
33	G St. and SR-99 NB Off-Ramp/14th St.	SSSC	AM	35	D	***66***	***F***	***38***	***E***	***52***	***F***	***74***	***F***	**53**	***F***	***73***	***F***
			PM	32	D	***38***	***E***	***38***	***E***	***44***	***E***	***41***	***E***	32	D	***41***	***E***
34	G St. and SR-99 SB On-Ramp	SSSC	AM	8	A	8	A	8	A	8	A	8	A	8	A	8	A
			PM	9	A	9	A	9	A	9	A	9	A	9	A	9	A
35	Childs Ave. and Campus Pkwy.	Signal	AM	17	B	16	B	17	B	19	B	17	B	17	B	18	B
			PM	18	B	19	B	19	B	21	C	20	C	19	B	18	B
36	Yosemite Pkwy. and Campus Pkwy.	Signal	AM	34	C	33	C	44	D	36	D	36	D	34	C	41	D
			PM	45	D	34	C	45	D	38	D	45	D	35	D	47	D
37	Olive Ave. and Campus Pkwy.	Signal	AM	26	C	21	C	34	C	25	C	37	D	26	C	28	C
			PM	30	C	31	C	34	C	24	C	35	C	22	C	29	C
38	Yosemite Ave. and Campus Pkwy.	Signal	AM	37	D	50	D	46	D	45	D	41	D	23	C	54	D
			PM	25	C	31	C	36	D	30	C	29	C	20	C	38	D
39	Dunn Rd. and Campus Pkwy.	Signal	AM	*DOES NOT EXIST*		10	A	7	A	6	A	7	*A*	DOES NOT EXIST		A	12
			PM			13	B	8	A	7	A	10	*A*			A	14

Int. No.	Intersection	Control	Period	No Build Delay	No Build LOS	No Action Delay	No Action LOS	Proposed Action Delay	Proposed Action LOS	Proposed Actn+Expwy[2] Delay	Proposed Actn+Expwy[2] LOS	2002 Project Delay	2002 Project LOS	Bellevue Delay	Bellevue LOS	Yosemite Delay	Yosemite LOS
40	Cardella Ave. and Campus Pkwy.	Signal	AM	45	D	35	C	42	D	47	D	55	D	33	C	31	C
			PM	14	B	24	C	38	D	36	D	61	E	22	C	31	C
41	Road D and Campus Pkwy.	Signal/ Roundabout[1]	AM	4	A	6	A	19	B	19	C	11	B	*DOES NOT EXIST*		17	B
			PM	5	A	11	A	31	C	16	B	12	B			18	B
42	Bellevue Rd and Campus Pkwy.	Signal/ Roundabout[1]	AM	5	A	43	D	12	B	30	C	15	B	46	D	43	D
			PM	8	A	44	D	18	B	12	B	14	B	35	C	35	C
43	Dunn Rd. (West) and Campus Pkwy.	Signal	AM	DOES NOT EXIST		DOES NOT EXIST		17	B	6	A	17	B	N/A[3]		9	A
			PM					13	B	12	B	14	B			11	B
44	Road B and Campus Pkwy.	Signal	AM	DOES NOT EXIST		DOES NOT EXIST		22	C	14	B	29	C	DOES NOT EXIST		19	B
			PM					23	C	12	B	22	C			11	B
45	Road C and Campus Pkwy.	SSSC	AM	DOES NOT EXIST		DOES NOT EXIST		16	C	17	C	17	C	DOES NOT EXIST		14	B
			PM					19	C	14	B	13	B			13	B
46	Road E and Campus Pkwy.	SSSC	AM	DOES NOT EXIST		DOES NOT EXIST		13	B	15	B	15	B	DOES NOT EXIST		12	B
			PM					14	B	14	B	13	B			11	B

Source: Fehr & Peers, October 2008

[1] *For intersections 41 and 42 Control is roundabout for Proposed Action and 2002 Project alternatives; for all other alternatives, intersection 41 and 42 are assumed to be signalized*

[2] *Full Title; Proposed Action with Merced-Atwater Expressway*

[3] *Intersection not studied for Bellevue alternative*

Bold and Shaded *= Significant Impact*

Bold Not Shaded *- Below standard LOS*

Table 4.13-14
Intersection Impact and Mitigation Summary – Future Conditions (2030)

Intersection	1	14	33
2030 No Action			AM/PM
2030 Project	AM/PM	PM	AM/PM
2030 – Project – Merced Atwater Expressway	AM/PM		AM/PM
2030 – 2002 Project		PM	AM/PM
2030 Bellevue	AM/PM		AM
2030 Yosemite			AM/PM
Mitigations	Add second SBL lane, 100', NBR, EBR, pockets; Add second SBT, NBT, EBT lanes.	Add second NBL lane; add second EBL lane; add second WBL lane	Signalize Intersection

Source: Fehr & Peers 2008

These impacts are similar to those of the Proposed Action Alternative, except that, at Intersection 33, the impact only occurs for the AM peak hour and not both the AM and PM peak hours as identified for the Proposed Action Alternative. The Bellevue Ranch Alternative would not impact Intersection 14, West Olive Avenue and R Street.

The improvements for these intersection impacts are given in **Table 4.13-11,** above. The improvement for Intersection 1 is to add a second southbound left-turn lane and second southbound through lane; add second northbound through lane; add second eastbound through lane and exclusive eastbound right-turn lane, similar to the improvement under the Proposed Action. The improvement for Intersection 33 is to signalize the intersection, similar to the improvement under the Proposed Action. Additionally, the above-mentioned impact would be mitigated by **Mitigation Measures TRANS-1A** and **TRANS-1B.** However, implementation of these improvements cannot be assured, as it depends on actions by other jurisdictions and thus the impact would remain **significant and unavoidable**.

4.13.6.4 Alternative 4 – 2002 Proposed Project

The 2002 Proposed Project is the Campus and University Community as defined in the 2002 LRDP and EIR. **Table 4.13-15, Trip Generation – 2002 Proposed Project Alternative,** gives the trip generation for

this alternative. The trip generation calculations incorporate the same principles regarding internalization of trips, but the net number of trips which travel external to the site is lower than for the Proposed Action, because the 2002 Proposed Project has a lower level of office, retail, and business park development. The difference is in the Community North, as can be seen by comparing **Table 4.13-15** and **Table 4.13-7**. The net new daily trips traveling external to the site for the 2002 Proposed Project (Campus and Community combined) is 53,000 trips, as compared to 58,000 trips for the Proposed Action.

Roadway Segment Impacts

Table 4.13-12 shows the roadway LOS results for the 2002 Proposed Project Alternative, along with the results for all of the alternatives. As shown in **Table 4.13-12**, this alternative would not cause any road segments to operate over capacity.

Table 4.13-12, also shows the roadway segments where this alternative would add 1 percent or more to the traffic growth on planned roadway segment that would be widened or expanded in the future. This alternative would impact the same 18 road segments identified above for the Proposed Action.

Intersection Impacts

Table 4.13-13 shows the intersection LOS results for the 2002 Proposed Project Alternative, along with the results for all of the alternatives. As indicated by the shaded entries in **Table 4.13-13**, the 2002 Proposed Project Alternative would result in significant impacts at two intersections:

- Intersection 14 – west Olive Avenue and R Street
- Intersection 33 – G Street/Highway 99 Off-ramp/14th Street during both AM and PM peak hours

These impacts are similar to those under the Proposed Action. The 2002 Proposed Project Alternative does not significantly impact Intersection 1, Bellevue Road and Highway 59.

The improvements to address these intersection impacts of the 2002 Proposed Project Alternative are given in **Table 4.13-14**. The improvements are the same as those recommended for the Proposed Action Alternative, and are as follows:

- Intersection 14 – Construct a second left-turn lane of equal length to the existing left-turn lane for the northbound, eastbound, and westbound approaches
- Intersection 33 – Signalize the intersection

Table 4.13-15
Trip Generation – 2002 Proposed Project Alternative

	Acres	Dwelling Units	S.F	Empl.	Trip Rate	Trip Generation	Regional		Local	
							Prod	Attr	Prod	Attr
Campus Community North										
Schools	30					2,402		-		2,402
Parks	108				1.59/Acre	172		-		172
Retail	10		466,000	1,165	19.90/Empl	23,184		2,318		20,865
Office	16		724,000	2,069	3.80/Empl	7,862		3,145		4,717
Business Park (Research/R&D)	22		400,000	1,143	3.35/ Empl	3,829		1,723		2,106
Single Family Units	408	2,939			7.40/ D.U.	21,749	7,612		14,137	
Multi-Family Units	89	2,854			4.65/ D.U.	13,271	4,645		8,626	
Sub-Total Community North	683	5,793	1,590,000	4,377		72,468	12,257	7,186	22,763	30,262
Campus Community South										
Schools	80					4,804		-		4,804
Parks	148				1.59/Acre	235		-		235
Retail	15		250,000	625	19.90/Empl	12,438		1,244		11,194
Office	9		140,000	400	3.80/Empl	1,520		608		912
Single Family Units	560	4,029			7.40/D.U.	29,815	10,435		19,379	
Multi-Family Units	75	1,794			4.65/D.U.	8,342	2,920		5,422	
Sub-Total Community South	887	5,823	390,000	1,025		57,154	13,355	1,852	24,802	17,145
Community Total	1,570	11,616	1,980,000	5,402		129,622	25,612	9,038	47,565	47,407
UC Campus	25,000 Students				2.08/Student	52,000	9,100	9,100	16,900	16,900
Total Trip Generation, Campus + Community						**181,622**	**34,712**	**18,138**	**64,465**	**64,307**

Source: Fehr & Peers, October 2008

[1] *Total acreages do not include streets and parking.*

Additionally, the above-mentioned impact would be mitigated by **Mitigation Measures TRANS-1A** and **TRANS-1B.** However, implementation of intersection improvements cannot be assured, as it depends on actions by other jurisdictions and thus the impact would remain **significant and unavoidable**.

4.13.6.5 Alternative 5 – No Action

The No Action Alternative would allow the University to complete the Phase 1.1 Campus, serving 3,612 students, within the currently approved boundary, and would also allow Community South to develop since that development could occur outside the approval process for the Proposed Action.

The trip generation for this alternative is shown in **Table 4.13-16, Trip Generation – No Action Alternative,** presented at the end of this section. The same trip internalization principles are incorporated into this alternative as are incorporated into the Proposed Action trip generation; however, because the campus growth is limited, most of the Community South trips would be external to the site. The total external trip generation is therefore approximately 25,500 trips, as compared to 58,000 external trips with the Proposed Action.

Roadway Segment Impacts

Table 4.13-12 shows the roadway LOS results for the No Action Alternative, along with the results for all of the alternatives. As shown in **Table 4.13-12**, the No Action Alternative would not cause any of the roadway segments to exceed their capacity,

Table 4.13-12, also shows the roadway segments where this alternative would add 1 percent or more to the traffic growth on planned roadway segments that would be widened or expanded in the future. This alternative would impact 16 of the 18 road segments identified above for the Proposed Action.

Intersection Impacts

Table 4.13-13 shows the intersection LOS results for the No Action Alternative, along with the results for all of the alternatives. As indicated by the shaded entries in **Table 4.13-13**, the No Action Alternative would result in a significant impact to:

- Intersection 33 – G Street/Highway 99 Off-ramp/14th Street during both AM and PM peak hours

This impact is similar to that under the Proposed Action Alternative. The Yosemite Avenue Alternative would not impact two other intersections that are affected with the Proposed Action – intersections 1 (Bellevue Road/SR 59) and 14 (Olive Avenue/R Street).

Table 4.13-16
Trip Generation – No Action Alternative

	Acres	Dwelling Units	S.F	Empl.	Trip Rate	Trip Generation	Regional		Local	
							Prod	Attr	Prod	Attr
Campus Community North										
Schools								-		
Parks					1.59/Acre			-		
Retail					19.90/Empl.					
Office					3.80/Empl.					
Business Park (Research/R&D)					3.35/ Empl.					
Single Family Units					7.40/ D.U.					
Multi-Family Units					4.65/ D.U.					
Sub-Total Community North										
Campus Community South										
Schools	80					4,804		-		4,804
Parks	148				1.59/Acre	235		-		235
Retail	15		250,000	625	19.90/Empl.	12,438		1,244		11,194
Office	9		140,000	400	3.80/Empl.	1,520		608		912
Single Family Units	560	4,029			7.40/D.U.	29,815	16,398		13,417	
Multi-Family Units	75	1,794			4.65/D.U.	8,342	4,588		3,754	
Sub-Total Community South	887	5,823	390,000	1,025		57,154	20,986	1,852	17,171	17,145
Community Total	887	5,823	390,000	1,025		57,154	20,986	1,852	17,171	17,145
UC Campus	3,612 Students				2.08/Student	7,513	1,315	1,315	2,442	2,442
Total Trip Generation, Campus + Community						**64,666**	**22,301**	**3,167**	**19,612**	**19,587**

Source: Fehr & Peers, October 2008.

The traffic improvement to address the intersection impact is given in **Table 4.13-11**. In this case, the improvement for Intersection 33 is to signalize the intersection (same as the improvement under the Proposed Action). Additionally, the above-mentioned impact would be mitigated by payment of traffic impact fees to the County. However, the implementation of this measure cannot be assured, as it depends on actions by other jurisdictions and thus the impact would remain significant and unavoidable.

4.13.6.6 Alternative 6 – No Build

Under the No Build alternative, no further development of the Campus would occur, and no development of the University Community would occur. Thus, there are no project impacts identified for this case.

4.13.6.7 Alternate Scenario 1 – Proposed Action with Merced-Atwater Expressway

The Merced-Atwater Expressway is a future transportation improvement project that is currently in environmental review. This expressway would connect the intersection of Bellevue Road and Highway 59 with Highway 99. Although the improvement project is included in the MCAG Regional Transportation Plan, it is not currently funded. Therefore, this project was not included among the regional improvements that were assumed to be a part of the road network in 2030 in the impact analysis presented above. To evaluate the effect this improvement project could potentially have on regional traffic including traffic with the Proposed Action in 2030 conditions, an additional scenario was evaluated. The Proposed Action's traffic impacts were evaluated assuming that the Merced-Atwater Expressway would be constructed. Construction of the Merced-Atwater Expressway would improve regional connectivity and would affect the Proposed Action's trip distribution and assignment resulting in different roadway and intersection forecasts.

Roadway Segment Impacts

Table 4.13-12 shows the roadway LOS results for the Proposed Action with the Merced-Atwater Expressway (as well as all other alternatives). As shown in **Table 4.13-12,** implementation of this alternative would not cause any of the road segments to operate over capacity.

Table 4.13-12 also shows the roadway segments, where this alternative would add 1 percent or more to the traffic growth on roadway segment that would be widened or extended in the future. This alternative would impact the same 18 road segments as identified above for the Proposed Action.

Intersection Impacts

Table 4.13-13 shows the intersection LOS results for the Proposed Action with the construction of the Merced-Atwater Expressway (as well as for the alternatives). As shown in the table, the Proposed Action

with the construction of the expressway would have a significant impact at Intersection 33, G Street and 14th Street at the Highway 99 northbound off-ramp. This impact is similar to that of the Proposed Action at this location. With the construction of the Merced-Atwater Expressway, the Proposed Action would not impact two other intersections – intersections 1 (Bellevue Road/SR 59) and 14 (Olive Avenue/R Street).

The mitigation for the intersection impacts are provided in **Table 4.13-14**. In this case, the mitigation for Intersection 33 is to signalize the intersection (same as the improvement for Proposed Action). Additionally, the above-mentioned impact would be mitigated by **Mitigation Measure TRANS-1.** However, implementation of the needed improvement cannot be assured, as it depends on actions by other jurisdictions and thus the impact would remain **significant and unavoidable**.

4.13.6.8 Alternate Scenario 2 – Proposed Action with General Plan Update Growth

This analysis presents the estimated impacts of the Proposed Action on 2030 conditions with land use and roadway network assumptions consistent with the proposed General Plan Update. Note that the General Plan Update land use and network assumptions are still in development at the time of the writing of the Draft EIS/EIR. Therefore, the growth projections eventually adopted by the City as part of the General Plan Update may be different from the projections used in this analysis. However, because this is the best information that is available at this time, it has been used to analyze whether the traffic impacts presented in Impact TRANS-1 would be worse than indicated there.

The General Plan Update contains different amounts and geographic distribution of land use growth within the City limits and sphere of influence, as well as different assumptions about the future roadway network as compared to the current General Plan. The current General Plan envisions a population of approximately 150,000 people at buildout. The General Plan Update plans for a population of approximately 270,000, including the UC Merced Campus and University Community and significant growth on the Bellevue Road corridor. The technical appendix of the traffic report (see **Appendix 4.13)** contains the land uses broken down by traffic analysis zone (TAZ) for both the current General Plan, as reflected in the MCAG Travel Demand Model, and the proposed General Plan Update, as currently envisioned. The roadway network differences can be seen in **Table 4.13-17, Roadway Capacities – Future Conditions (2030 with General Plan Update)**.

Table 4.13-17
Roadway Capacities – Future Conditions (2030 With General Plan Update)

No.	Roadway Segment	Locations	Roadway Capacity Adopted General Plan			Roadway Capacity Draft General Plan Update		
			Facility Type	No. of Lanes	Capacity	Facility Type	No. of Lanes	Capacity
1A.	Campus Pkwy.	South of Bellevue	Arterial	4	36,000	Arterial	4	36,000
2A.	Campus Pkwy.	South of Cardella	Arterial	4	36,000	Arterial	4	36,000
3.	McKee	South of Yosemite Ave	Arterial	2	18,000	Arterial	2	18,000
4.	McKee	South of Olive	Arterial	2	18,000	Arterial	2	18,000
5.	Yosemite Ave.	Highway 59 to G St.	Arterial	4	36,000	Arterial	4	36,000
6.	Yosemite Ave.	G St. to N. Parsons	Arterial	4	36,000	Arterial	4	36,000
7.	Yosemite Ave.	N. Parsons to Lake	Collector	4	24,000	Collector	4	24,000
8.	Yosemite Ave.	East of Lake	County Road	2	21,600	County Road	2	21,600
9.	Yosemite Ave.	East of Kibby	County Road	2	21,600	County Road	2	21,600
10.	Yosemite Pkwy.	West of Santa Fe Ave.	Arterial	4	36,000	Arterial	4	36,000
11.	Yosemite Pkwy.	East of Santa Fe Ave.	Highway	4	86,400	Highway	4	86,400
12.	Olive Ave.	East of SR 59	Arterial	6	54,000	Arterial	6	54,000
13.	Olive Ave.	West of G St.	Arterial	6	54,000	Arterial	6	54,000
14.	Olive Ave.	East of G St.	Arterial	4	36,000	Arterial	4	36,000
15.	G St.	South of Bellevue	Arterial	4	36,000	Arterial	4	36,000
16.	G St.	South of Cardella	Arterial	4	36,000	Arterial	4	36,000
17.	G St.	South of Yosemite Ave	Arterial	4	36,000	Arterial	4	36,000
18.	G St.	South of Olive	Arterial	4	36,000	Arterial	4	36,000
19.	M St.	North of 23rd	Arterial	4	36,000	Arterial	4	36,000
20.	M St.	South of 23rd	Arterial	4	36,000	Arterial	4	36,000
21.	SR-59	South of Bellevue	Arterial	2	18,000	Arterial	2	18,000
22.	SR-59	South of Cardella	Arterial	2	18,000	Arterial	2	18,000

No.	Roadway Segment	Locations	Roadway Capacity Adopted General Plan			Roadway Capacity Draft General Plan Update		
			Facility Type	No. of Lanes	Capacity	Facility Type	No. of Lanes	Capacity
23.	SR-59	South of Yosemite Ave.	Arterial	2	18,000	Arterial	2	18,000
24.	SR-59	South of Olive	Arterial	4	36,000	Arterial	4	36,000
25.	Cardella Road	Between SR 59 and M St.	Arterial	4	36,000	Arterial	4	36,000
26.	Cardella Road	Between G St and Lake	Arterial	4	36,000	Arterial	4	36,000
27.	16th St.	West of SR-59	Arterial	4	36,000	Arterial	4	36,000
28.	Kibby	South of Yosemite Ave.	County Road	2	21,600	County Road	2	21,600
29.	Kibby	North of Yosemite Pkwy.	County Road	2	21,600	County Road	2	21,600
30.	N. Parsons Ave.	E. Olive to Yosemite	Collector	2	12,000	Arterial	4	36,000
31.	S. Parsons Ave.	E. Olive to Santa Fe	Collector	2	12,000	Arterial	4	36,000
32.	Bellevue Road	Lake to G St.	Arterial	6	54,000	Arterial	6	54,000
33.	Bellevue Road	G St. to SR-59	Arterial	6	54,000	Highway	2	43,200
34.	Bellevue Road	West of SR-59	Collector	2	12,000	Arterial	6	54,000
35.	SR-140	West of Massasso	Highway	2	43,200	Arterial	6	54,000
36.	SR-99	North of 16th St.	Freeway	4	96,000	Freeway	6	144,000
37.	SR-99	North of M St.	Freeway	4	96,000	Freeway	6	144,000
38.	SR-99	South of Yosemite Pkwy	Freeway	4	96,000	Freeway	6	144,000
39.	SR-99	South of Mission Ave	Freeway	4	96,000	Freeway	6	144,000
40.	Campus Pkwy.	E. Yosemite to E. Olive	Expressway	4	62,500	Arterial	4	36,000
41.	Campus Pkwy.	E. Olive to SR-99	Expressway	4	62,500	Arterial	4	36,000
42.	Cardella Road	M St. to G St.	Arterial	4	36,000	Arterial	6	54,000
43.	R Street	W. Yosemite to Bellevue	Arterial	4	36,000	Arterial	4	36,000
44.	N. Parsons Ave.	E. Yosemite to Bellevue	Arterial	4	36,000	Arterial	4	36,000

Source: Fehr & Peers, October 2008

Roadway Segment Impacts

Table 4.13-18, Roadway LOS – Future Conditions (2030 with General Plan Update) shows the LOS results for this alternative. As with the Proposed Action (with existing General Plan land use and network assumptions), no roadway segments are projected to be over capacity in 2030; however, the alternative does contribute traffic to several roadway segments for which there are planned improvement projects. The percent contribution was not calculated for this case, since it is provided for information only. However, the shaded cells in **Table 4.13-18** show the segments that are likely to have a minimum 1 percent traffic contribution from the Campus, in the General Plan Update scenario.

4.13.7 SUMMARY COMPARISON OF ALTERNATIVES

Table 4.13-19, Summary Comparison of Alternatives - Affected Roadway Segments and Intersections, provides a summary comparison of the impacts to roadway segments by the Proposed Action and its alternatives. As shown in the table, the No Build Alternatives would not impact any of the 18 roadway segments that have been identified to be impacted by the Proposed Action. The No Action Alternative would impact 16 of the 18 segments impacted by the Proposed Action and the Yosemite Avenue Alternative would impact 17 of the 18 segments that would be impacted by the Proposed Action. The remainder of the alternatives would have similar impacts to the Proposed Action and would impact the same 18 roadway segments as the Proposed Action.

Table 4.13-19 also provides a summary comparison of the impact to intersections by the Proposed Action and its alternatives. As shown in the table, the No Build Alternative would not impact any of the three intersections that would result in a significant impact with the Proposed Action. The No Action, Proposed Action with the Atwater Expressway, and Yosemite Avenue Alternatives would impact one of the three intersections as identified for the Proposed Action. The 2002 Proposed Project and Bellevue Ranch Alternative would impact two out of the three intersections that would be impacted by the Proposed Action.

Although the impacts vary from alternative to alternative, they all would require mitigation, specifically the Campus Traffic Mitigation Program as described above in **Mitigation Measure TRANS-1**. However, because the full funding and construction of the roadway and intersection improvements identified in this mitigation measure cannot be assured, as it depends on actions by other jurisdictions, the traffic impact identified for all alternatives, minus the No Build Alternative, would remain significant and unavoidable.

4.13.8 REFERENCES

Fehr and Peers, 2008. Draft Transportation Impact Analysis for UC Merced.

Table 4.13-18
Roadway LOS – Future Conditions (2030 With General Plan Update)

No.	Roadway Segment	Location	2030 Proposed Action (adopted General Plan Land Use)					2030 Proposed Action (proposed General Plan Lane Use)				
			Facility Type	No. of Lanes	Capacity	Volume	LOS	Facility Type	No. of Lanes	Capacity	Volume	LOS
1A	Campus Pkwy	Cardella to Bellevue	Arterial	4	36,000	19,750	A	Arterial	4	36,000	24,800	B
2A	Campus Pkwy	Yosemite to Cardella	Arterial	4	36,000	31,000	D	Arterial	4	36,000	29,750	C
3	McKee	South of Yosemite Ave	Arterial	2	18,000	14,150	C	Arterial	2	18,000	7,150	A
4	McKee	South of Olive Ave	Arterial	2	18,000	17,300	D	Arterial	2	18,000	10,600	A
5	W. Yosemite Ave	SR 59 to G St	Arterial	4	36,000	13,350	A	Arterial	4	36,000	17,500	A
6	E. Yosemite Ave	G St to N. Parsons	Arterial	4	36,000	27,750	C	Arterial	4	36,000	24,200	B
7	E. Yosemite Ave	N. Parsons to Lake/Campus Pkwy[1]	Collector	4	24,000	17,500	B	Collector	4	24,000	8,500	A
8	E. Yosemite Ave	Lake to Kibby	County Road	2	21,600	18,950	D	County Road	2	21,600	11,850	A
9	E. Yosemite Ave	East of Kibby	County Road	2	21,600	11,700	A	County Road	2	21,600	7,200	A
10	Yosemite Pkwy	West of Santa Fe Ave	Arterial	4	36,000	14,550	A	Arterial	4	36,000	12,050	A
11	Yosemite Pkwy	East of Santa Fe Ave	Highway	4	86,400	16,800	A	Highway	4	86,400	14,800	A
12	Olive Avenue	East of SR 59	Arterial	6	54,000	43,850	C	Arterial	6	54,000	37,650	B
13	Olive Avenue	West of G St	Arterial	6	54,000	38,300	B	Arterial	6	54,000	31,750	A
14	Olive Avenue	East of G St	Arterial	4	36,000	25,350	B	Arterial	4	36,000	25,300	B
15	G Street	Cardella to Bellevue	Arterial	4	36,000	20,950	A	Arterial	4	36,000	21,650	B
16	G Street	Yosemite to Cardella	Arterial	4	36,000	18,550	A	Arterials	4	36,000	17,900	A
17	G Street	South of Yosemite Ave	Arterial	4	36,000	26,250	B	Arterial	4	36,000	25,050	B
18	G Street	South of Olive	Arterial	4	36,000	33,000	D	Arterial	4	36,000	30,100	C
19	M Street	North of 23rd	Arterial	4	36,000	19,250	A	Arterial	4	36,000	19,850	A
20	M Street	South of 23rd	Arterial	4	36,000	17,600	A	Arterial	4	36,000	19,100	A
21	SR-59	South of Bellevue	Arterial	2	18,000	8,550	A	Arterial	2	18,000	9,450	A
22	SR-59	South of Cardella	Arterial	2	18,000	13,600	C	Arterial	2	18,000	12,100	B
23	SR-59	South of Yosemite Ave	Arterial	2	18,000	18,000	D	Arterial	2	18,000	18,000	D
24	SR-59	16th St. to W. Olive	Arterial	4	36,000	35,200	D	Arterial	4	36,000	34,300	D
25	Cardella Road	SR-59 to M St	Arterial	4	36,000	2,000	A	Arterial	4	36,000	3,700	A
26	Cardella Road	G St. to Lake/ Campus Parkway[1]	Arterial	4	36,000	16,250	A	Arterial	4	36,000	17,050	A
27	16th St.	West of SR-59	Arterial	4	36,000	27,700	C	Arterial	4	36,000	27,250	C
28	Kibby Rd.	South of Yosemite Ave	County Road	2	21,600	8,550	A	County Road	2	21,600	5,100	A
29	Kibby Rd.	North of Yosemite Pkwy	County Road	2	21,600	12,650	A	County Road	2	21,600	5,650	A
30	N. Parsons Avenue	E. Olive to E. Yosemite	Collector	2	12,000	12,000	D	Arterial	4	36,000	22,950	B
31	N. Parsons Avenue	E. Olive to Santa Fe	Collector	2	12,000	12,000	D	Arterial	4	36,000	27,900	C
32	Bellevue Road	Lake/Campus Parkway to G St [1]	Arterial	6	54,000	20,300	A	Arterial	6	54,000	20,900	A

No.	Roadway Segment	Location	2030 Proposed Action (adopted General Plan Land Use)					2030 Proposed Action (proposed General Plan Lane Use)				
			Facility Type	No. of Lanes	Capacity	Volume	LOS	Facility Type	No. of Lanes	Capacity	Volume	LOS
33	Bellevue Road	G St. to SR-59	Arterial	6	54,000	14,700	A	Arterial	6	54,000	12,800	A
34	Bellevue Road	West of SR-59	Collector	2	12,000	7,700	B	Arterial	6	54,000	28,750	A
35	SR-140	West of Massasso	Highway	2	43,200	10,000	A	Highway	2	43,200	21,600	A
36	SR-99	North of 16th St	Freeway	4	96,000	71,300	B	Freeway	6	144,000	86,450	B
37	SR-99	North of M St	Freeway	4	96,000	66,250	B	Freeway	6	144,000	80,700	A
38	SR-99	South of Yosemite Pkwy	Freeway	4	96,000	49,900	A	Freeway	6	144,000	65,250	A
39	SR-99	South of Mission Ave	Freeway	4	96,000	57,650	B	Freeway	6	144,000	68,100	A
40	Campus Pkwy	E. Yosemite Ave to E. Olive Ave	Expressway	4	62,500	30,550	A	Arterial	4	36,000	27,300	C
41	Campus Pkwy	E. Olive Ave. to SR- 99	Expressway	4	62,500	29,800	A	Arterial	4	36,000	28,000	C
42	Cardella Road[2]	G St to M St	Arterial	4	36,000	18,300	A	Arterial	6	54,000	33,100	B
43	R Street	W. Yosemite to Bellevue	Arterial	4	36,000	25,300	B	Arterial	4	36,000	24,100	B
44	N. Parsons/Gardner	E. Yosemite to Bellevue	Arterial	4	36,000	23,550	B	Arterial	4	36,000	16,750	A

For the 2030 case, these segments extend to Campus Parkway
Segment 42: Existing Volume estimated
***Bold** = Roadway segment at or near capacity*
Shading = Adopted General Plan: project impact based on >1% project traffic contribution to a roadway with a planned improvement project;
Proposed General Plan: possible project impact based on >1% (percent calculations were not performed for this case)
Note: Proposed General Plan Land Use includes development in the proximity of campus that is not included in currently-adopted version of the General Plan. Some Campus traffic is shifted to parallel routes to accommodate other development traffic, as reflected by lower volumes on some segments.
Source: Fehr & Peers, October 2008.

Table 4.13-19
Summary Comparison of Alternatives - Affected Roadway Segments and Intersections

Roadway Segment/ Intersection	Location	Alternatives						Different Scenarios	
		No Build	No Action	Proposed Action	2002 Project	Bellevue	Yosemite	Proposed Action + Expressway	Proposed Action + GP Growth
Roadway Segments									
1. Campus Pkwy	Cardella to Bellevue	-	X	X	X	X	X	X	X
2. Campus Pkwy	Yosemite to Cardella	-	X	X	X	X	X	X	X
5. E. Yosemite Ave	SR-59 to R St	-	X	X	X	X	X	X	X
7. E. Yosemite Pkwy	N. Parsons to Campus Pkwy	-	X	X	X	X	X	X	X
10. Yosemite Pkwy	West of Santa Fe	-	X	X	X	X	X	X	X
11. Yosemite Pkwy	East of Santa Fe	-	X	X	X	X	X	X	X
15. G Street	Cardella to Bellevue	-	-	X	X	X	X	X	X
16. G Street	E. Yosemite to Cardella	-	X	X	X	X	X	X	X
25. Cardella Road	SR59 to M St	-	X	X	X	X	X	X	X
26. Cardella Road	G St. to Campus Pkwy	-	X	X	X	X	X	X	X
32. Bellevue Road	Campus Pkwy to G St	-	X	X	X	X	X	X	X
30. N. Parsons Ave	E. Olive to E. Yosemite	-	-	-	-	-	-	-	X
31. N. Parsons Ave	E. Olive to Santa Fe	-	-	-	-	-	-	-	X
33. Bellevue Road	G St. to SR 59	-	X	X	X	X	X	X	X
34. Bellevue Road	West of SR-59	-	X	X	X	X	X	X	X
35. SR-140	West of Massasso	-	-	-	-	-	-	-	X
36. SR-99	North of 16th St	-	-	-	-	-	-	-	X
37. SR-99	North of M St	-	-	-	-	-	-	-	X
38. SR-99	South of Yosemite Pkwy	-	-	-	-	-	-	-	X

Roadway Segment/ Intersection	Location	Alternatives						Different Scenarios	
		No Build	No Action	Proposed Action	2002 Project	Bellevue	Yosemite	Proposed Action + Expressway	Proposed Action + GP Growth
39. SR-99	South of Mission Ave	-	-	-	-	-	-	-	X
40. Campus Pkwy	E. Yosemite to E. Olive	-	X	X	X	X	X	X	X
42. Campus Pkwy	E. Olive to SR 99	-	X	X	X	X	X	X	X
42. Cardella Rd	Between G St. and M St	-	X	X	X	X	X	X	X
43. R Street	W. Yosemite to Bellevue	-	-	X	X	X	-	X	X
44. N. Parsons/Gardner	E. Yosemite to Bellevue	-	X	X	X	X	X	X	X
TOTAL		**0**	**16**	**18**	**18**	**18**	**17**	**18**	**25**
Study Intersections									
1. Highway 59/ Bellevue	N/A	-	-	X	-	X	-	-	N/D
14. R Street/W. Olive	N/A	-	-	X	X	-	-	-	N/D
33. G Street/14th Street/ SR 99 NB off-ramp	N/A	-	X	X	X	X	X	X	N/D
TOTAL		**0**	**1**	**3**	**2**	**2**	**1**	**1**	

Notes:
X = significant impact
- = no significant impact
N/D = no determination

4.14 UTILITIES AND SERVICE SYSTEMS

4.14.1 INTRODUCTION

This section describes the existing environmental conditions pertaining to the public utility systems on the project site and its vicinity. A discussion of the regulatory setting follows the description of the environmental setting. The section discusses the demand for utilities associated with the development of the Campus and University Community and evaluates the environmental consequences from the construction and operation of utility improvements needed to serve the Campus and University Community. The primary concerns related to utilities and service systems are environmental effects of supplying the project with potable water, water for fire protection, irrigation water, wastewater disposal, solid waste disposal, electricity, and natural gas.

Sources of information used in this analysis include:

- Merced County General Plan (County of Merced 1990)
- 2002 Long Range Development Plan EIR (UC Merced 2002)
- 2004 University Community Plan EIR (County of Merced 2004)

Public and agency comments related to utilities received in response to the Notice of Preparation/Notice of Intent are summarized below.

- The City urges the US Army Corps of Engineers (USACE) to ensure that the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) analyzes the impacts of the proposed project on potential service options for the various urban services that the Campus and associated University Community will require at buildout, including those for water and wastewater treatment.

The various service options for urban services are evaluated in this section.

4.14.2 AFFECTED ENVIRONMENT

At the present time, the sites of both the Campus and University Community under the Proposed Action are located within incorporated Merced County. Therefore, under existing conditions, with the exception of Phase 1.1 portion of the campus site, which is served by City water and wastewater services under a service agreement with the City, the remainder of the campus site and the entire University Community site are not served by any municipal utility systems.

As discussed in **Section 2.0, Project Description,** the Campus and University Community may be annexed to the City or may remain in unincorporated Merced County. Under one scenario, both areas

would be annexed to the City of Merced in the future in order to receive municipal utility services from the City, including water and wastewater. In the event that annexation does not take place or annexation is delayed, similar to the agreement for Phase 1.1 Campus, the University plans to enter into an agreement with the City for the provision of water and sewer service (as well as fire service) to the next phase of campus development. Under the other scenario, the Campus and University Community may not be served by City water and sewer services if the project site is not annexed, although Phases 1 and 2 of the Campus would be served by the City. Therefore, this section analyzes impacts to municipal utility services under both scenarios.

All other build alternatives are similarly located in unincorporated Merced County and would be annexed to the City of Merced to receive City services or would remain in the County. The one exception is the Bellevue Ranch Alternative, most of which is already annexed or within the City's existing sphere of influence (SOI); therefore, that site is already served by City utilities. Note that a small area in the northerly portion of the Bellevue Ranch Alternative site is outside the current City limits and SOI and would need to be annexed. Given the possibility that the sites of the Proposed Action and its alternatives would be annexed to the City in the future, the descriptions of public utility systems presented below address the City service departments that would serve the project if the sites were indeed annexed as well as County services.

4.14.2.1 Alternative 1 - Proposed Action

Water Service

Much of the water in Merced County is drawn from groundwater sources. Discussion of the size and status of the underground aquifer that provides this water is presented in **Section 4.8, Hydrology and Water Quality.** The reliability of the groundwater supply, including the effect of changes in global climate on the overall water supply in Merced County and the groundwater basin, is discussed in that section.

There are 25 irrigation and urban water districts that serve most of Merced County. These districts pump groundwater and divert water from the Merced River and out-of-county sources, including the Central Valley Project (CVP) and the State Water Project (SWP). The largest district is the Merced Irrigation District (MID), which diverts water from the Merced River for agricultural purposes. MID currently serves some of the area near the Proposed Action site and some of the alternative sites. However, with the exception of Community South, the Proposed Action site is not within the service area of MID. The City of Merced provides potable water service within the city limits of Merced. In order to provide for future

growth, the City of Merced and MID have entered into a cooperative water supply and management agreement (UC Merced 2002).

Water Supply

The City of Merced's water supply is drawn from 19 active production wells with a combined capacity of 49,500 gallons per minute (gpm). All of the wells pump directly into the distribution system and have chlorination facilities for disinfection.

The City of Merced provides potable water to the Phase 1.1 Campus via its distribution system. The water is primarily supplied by a 16-inch water line that was constructed within the roadway alignment of Bellevue Road. Well Number 17 was constructed on the Phase 1.1 Campus near the campus entrance as a secondary source of water because the 16-inch line is not sufficient to meet fire flow requirements. This design also assures that water supply to the campus would not be interrupted in the event that the campus well is taken off line for any reason. Well Number 17 is a City-owned facility located on UC land deeded to the City.. Ninety percent of the water from this well is supplied to the campus, with the remaining flow contributing to the City's distribution system. This well is capable of pumping 3,000 gpm (City of Merced 2005). A large aboveground 250,000-gallon water storage tank has been constructed on the Phase 1.1 Campus near the well. An on-campus distribution system delivers potable water to each building within the Phase 1.1 Campus. Irrigation water for the Phase 1.1 Campus is also obtained from the City of Merced supply. Non-potable water may also be obtained from the MID canals for the Phase 1.1 Campus. In addition to the well on the campus, irrigation wells are located on the southern portion of the campus site and are used to irrigate the grazing pastures on site.

The University Community site is currently not served by any municipal utility systems. At present, on-site irrigation wells on the Community North property are used for pasture irrigation, and additional wells located within Community South are used by LWH Farms, LLC, to irrigate crops and for domestic use in the farm residences on the site. The nearest City of Merced water mains are located at the intersection of Yosemite Avenue and McKee Road and at the Bellevue/Lake intersection.

Recycled Water

Water recycling is the use of treated wastewater to meet non-potable water demands. Outdoor water demands (e.g., landscape irrigation) are ideally suited for water recycling. Water treated to certain standards established in Title 22 of the California Administrative Code can be used for spray irrigation of large turf areas and other community landscaping. Water recycling not only reduces the amount of potable water needed, but also results in less wastewater requiring disposal. However, water recycling requires a distribution system completely separate from the potable water distribution system (Merced

County 2004). Recycled water is used for pasture irrigation near the City of Merced wastewater treatment plant. There are no existing recycled water facilities in the vicinity of the Campus or University Community.

Wastewater

The Campus and University Community population would produce wastewater that would require conveyance to and treatment at a wastewater treatment facility outside of the Campus and University Community unless such a facility or facilities are developed within the project area. The County does not operate a regional wastewater treatment plant or collection system. Special districts, cities and private septic systems provide wastewater treatment in Merced County (Merced County 2004). The City of Merced owns and operates a municipal wastewater treatment system and provides service to all areas within city limits and also to some unincorporated areas outside the city limits, including Phase 1.1 Campus. The City's system consists of wastewater conveyance pipelines and a secondary wastewater treatment plant (WWTP) located approximately 3 miles south of the city (City of Merced 2006).

Wastewater Conveyance

The Phase 1.1 Campus is currently connected to the City of Merced wastewater collection and treatment system. To serve the Phase 1.1 Campus, a sanitary sewer line was installed in Bellevue Road that connects to the City of Merced's sewer system at an existing 27-inch trunk line on G Street near Merced College (see **Figure 3.0-7 Conceptual Sanitary Sewer System**). Although the sewer pipeline under Bellevue Road is sized to serve the full development of the campus, the existing 27-inch sewer pipeline on G Street has the remaining capacity to only serve a campus with up to 10,000 FTE students and associated faculty and staff (City of Merced 2008). For campus growth up to 10,000 FTE students, no off-site improvements to the wastewater collection system are needed.

There are no existing wastewater collection systems within the University Community area. The existing LWH Farms LLC property is served by a septic system for domestic wastewater treatment and disposal, as do the rural residences to the west of the University Community site (Merced County 2004).

Wastewater Treatment

Wastewater generated on the Phase 1.1 Campus is treated at the City of Merced WWTP. The City of Merced WWTP currently has a secondary treatment capacity of 12 million gallons per day (mgd), but is only permitted to treat up to 10 mgd. The WWTP currently treats an average flow of 8 mgd. In 2006, the City certified an EIR (SCH# 2005101135) for the expansion of the WWTP to a design capacity of 20 mgd. The additional capacity would be installed in phases and would include several facility upgrades, such as

tertiary filtration and solids dewatering and stabilization. With the completion of the first phase of upgrades (2010), the WWTP's permitted capacity will increase by 1.5 mgd to 11.5 mgd.

The City has indicated that the WWTP expansion would accommodate wastewater flows from the approved 1997 Specific Urban Development Plan (SUDP) that would generate approximately 17.1 mgd of wastewater, in addition to 2.25 mgd of wastewater flows expected from the full development of the campus based on the University's 2002 estimates of the wastewater that would be generated by the campus. Given that the City is in the process of updating its general plan and expanding its SOI and SUDP, new growth areas will likely be identified that cannot be served by the 20 mgd of planned WWTP capacity. The City has indicated that it is interested in providing sewer service to the campus on a long-term basis. Eventual annexation of the campus site to the City of Merced is required under present City policy in order to serve the campus with City sewer service.

As described in **Section 2.0, Project Description,** of this Draft EIR/EIS the University will also evaluate the feasibility of on-site wastewater treatment and recycling either on the campus or on the University Community site, using conventional or emerging technologies.

Solid Waste Disposal

The population at the Campus and University Community would generate solid waste. Wastes not defined as municipal solid waste, including hazardous and radioactive waste, are discussed in **Section 4.7, Hazardous Materials and Public Safety**, of this EIR/EIS. The County of Merced Department of Public Works oversees solid waste transportation and disposal operations of Class III municipal solid waste in Merced County. There are two landfills in the county. Waste from the Campus and University Community would be sent to the Merced County Highway 59 Landfill, located at 6049 North Highway 59.

This landfill has a permitted capacity of approximately 30 million cubic yards and is permitted to receive 1,314 cubic yards of waste on a daily basis, and up to 2,190 cubic yards for a daily maximum (California Integrated Waste Management Board [CIWMB] 2008). In 2001, the landfill received approval for an expansion of 140 acres of disposal area, or 25,859,000 cubic yards. This extends the projected life of the landfill until 2035, assuming a 4.3 percent growth factor and until 2038, assuming a 3 percent growth factor after 2015 (Merced County 2004).

Solid waste is collected by the City of Merced within the city limits, and by franchise hauling companies throughout the unincorporated areas of Merced County. The City and these companies also pick up some recyclable materials for a fee. The City picks up cardboard from businesses for a reduced fee. There is no

sorting or recycling plant in Merced County, but some recyclable material is accepted at the landfills, which is then taken to a recycling plant in Turlock.

California's Integrated Waste Management Act of 1989 (commonly referred to as AB 939) mandated a 25 percent reduction in solid waste in 1995 and a reduction of 50 percent by the year 2000. AB 939 requires that the 25 percent and 50 percent mandate be met through source reduction, recycling and composting. Each City and County is required to submit a plan (Source Reduction and Recycling Element) which describes how they will meet the waste reduction mandates. The University of California is exempt from this Act. However, sustainability is a central element of the 2009 LRDP and the Campus currently implements and will continue to expand programs to minimize solid waste. This is described in more detail in the section below on 2009 LRDP policies.

Electricity

The Campus and University Community sites are a part of the California Independent System Operator's Fresno local area. Currently, PG&E provides electricity to the City of Merced and to the Phase 1.1 Campus. Current electricity demand for Phase 1.1 Campus is approximately 1.7 megawatts during the peak period and approximately 3 kilowatts in the middle of the night. The Phase 1.1 Campus site is within PG&E's Wilson 115-kilovolt (kV) subarea. There are three PG&E transmission lines near the campus site: the 230-kV Belotta-Herndon line that originates at the Wilson Substation south of Childs Avenue and terminates north of Bellevue and west of Highway 59; the 115-kV Wilson-Atwater line; and the 70-kV Merced-Merced Falls line.

Natural Gas

PG&E currently supplies Merced County, including the existing UC Merced Phase 1.1 Campus, with natural gas. The main pipeline serving the City of Merced is an 8-inch-diameter transmission pipeline that parallels Highway 99 through Merced. Phase 1.1 Campus is connected to the regional natural gas distribution system via a pipeline aligned along Lake Road. Additional distribution lines and hook-ups are generally constructed on an "as-needed" basis.

4.14.2.2 Alternative 2, Yosemite Avenue

Under Alternative 2, the Campus and Community North would be located on UCLC and LWH Farms, LLC, lands and Community South, for large part, would be located south of Yosemite Avenue. Eventually, similar to the Proposed Action, the Campus and University Community could be annexed into the City of Merced. The same utilities and service systems would serve this site as are described

above for Alternative 1, Proposed Action. One or more new water wells would be located within the area of Community South (south of Yosemite Avenue) under this alternative.

4.14.2.3 Alternative 3, Bellevue Ranch Alternative

The Bellevue Ranch Alternative site is located approximately 2 miles west of the Phase 1.1 Campus area. The site of this alternative is within the SOI of the City of Merced, with the exception of a small area which is outside the SOI. The site would be served by City water and wastewater systems that are located in G Street and PG&E electricity and natural gas systems also already established in the vicinity of this alternative site.

4.14.2.4 Alternative 4, 2002 Proposed Project Alternative

Alternative 4, identified as the 2002 Proposed Project, is similar to Alternative 1, Proposed Action except that the Campus and the University Community areas are larger than under the Proposed Action. The site is mostly undeveloped with the exception of the Phase 1.1 Campus area and scattered farm-related structures on the LWH Farms, LLC, property. All utilities and service systems described above for the Proposed Action would also apply to this alternative.

4.14.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.14.3.1 State Regulations

SB 610 and SB 221 – Water Supply Assessments

In 2001, the California Legislature passed Senate Bills 610 (Water Code Section 10910 et seq.) and Senate Bill 221 (Water Code Section 66473.7) to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures which sought to promote more collaborative planning between local water suppliers and cities and counties.

Assembly Bill 939

In 1989, Assembly Bill (AB 939) established the current organization, structure and mission of CIWMB. The purpose was to direct attention to the increasing waste stream and decreasing landfill capacity, and to mandate a reduction of waste being disposed. Jurisdictions were required by AB 939 to meet diversion goals of 25 percent by 1995 and 50 percent by the year 2000. The City of Merced aims to achieve 75 percent diversion by 2010.

California Universal Waste Law

This legislation went into effect in February 2006. Universal wastes are a wide variety of hazardous wastes such as batteries, fluorescent tubes, and some electronic devices, that contain mercury, lead, cadmium, copper or other substances hazardous to human and environmental health. Universal waste may not be discarded in solid waste landfills, but instead are recyclable and (to encourage recycling and recovery of valuable metals) can be managed under less stringent requirements than those that apply to other hazardous wastes.

Government Code 54999

Government Code 54999 provides for the payment of fees in certain specific enumerated situations for capital improvements for utilities actually serving the University. A capital facilities fee that is imposed must be nondiscriminatory and the amount must not exceed the amount actually necessary to provide capital facilities to the University.

4.14.3.2 Local Plans and Policies

Merced County General Plan

The Merced County General Plan contains the following goals, policies, and implementation measures that would apply to the proposed University Community in the event it is not annexed to the City.

Goal 2: A high quality living environment within unincorporated communities.

Policy 5: SUDPs (Specific Urban Development Plans) which lack public sewer and water systems shall be limited to those land use designations and densities that can be accommodated by individual septic systems and wells.

Goal 4: Adequate water, sewer, and drainage facilities are provided to meet urban needs of the County.

Policy 1: Encourage providers of public water, sewer and storm drainage systems to maintain and expand their systems to meet the development needs of the County.

Policy 2: Effects on the capacity and distribution systems of water, sewer and storm drainage facilities shall be considered in reviews of discretionary and non-discretionary permits.

Merced County Code

The Merced County Code, Title 9, Chapter 9.52, regulates the agricultural land application of biosolids on unincorporated areas of Merced County. Septic systems are regulated through the Merced County Department of Public Health Division of Environmental Health, which enforces standards and criteria for septic systems.

Chapter 9.28 of the Merced County Code addresses the location, construction, maintenance, and abandonment of water wells, monitoring wells and cathodic protection wells. The Code requires permits from the County Health Officer for all actions involving wells and establishes standards for the construction, repair, abandonment or destruction of wells.

Chapter 16.40 of the County Code addresses the conservation of water and preservation of water quality through the use of drought tolerant plant material and retention of natural landscaping.

City of Merced General Plan

The City of Merced Vision 2015 General Plan contains the policies listed in **Table 4.14-1, City of Merced Vision 2015 General Plan Goals, Policies and Implementing Actions,** below with respect to water supply, wastewater and solid waste.

Table 4.14-1
City of Merced Vision 2015 General Plan
Goals, Policies, and Implementing Actions

Water and Wastewater	
Implementing Action 1.5.c	Monitor ground water in areas in and around the City using septic system wastewater disposal systems.
Goal P-4	An adequate wastewater collection, treatment and disposal system in Merced
Policy P-4.1	Provide adequate wastewater collection, treatment and disposal capacity for projected future needs.
Implementing Action P-4.1.a	Maintain the existing wastewater system to increase the lifetime of the system.
Implementing Action P-4.1.b	Develop wastewater master plans to serve future Merced urban expansion.
Implementing Action P-4.1.c	Design wastewater collection systems that discharge development of prime agricultural soils.
Implementing Action P-4.1.d	Coordinate wastewater planning activities with the County.
Policy P-4.2	Consider the use of reclaimed water to reduce non-potable water demands whenever practical.

Implementing Action P-4.2.a	Consider designs for reclaimed water systems, including pipelines, pump stations and storage ponds, to primarily serve as irrigation for feed and fodder crops
Implementing Action P-4.2.c	Consider preparing a plan for the use of reclaimed water which evaluates the facilities and costs required to serve potential users, determines required capacities of facilities, and presents an implementation plan.
Goal P-3	An adequate water source, distribution and treatment infrastructure system in Merced.
Policy P-3.1	Ensure that adequate water supply can be provided within the City's service area, concurrent with service expansion and population growth.
Implementing Action 3.1.b	Update City's Water Master Plan for the Sphere of Influence Area.
Implementing Action 3.1.c	Update the City's Water Master Plan to include the entire expanded SUDP area.
Implementing Action 3.1.d	Review the current water system maintenance program and coordinate planned water main replacements with the updated Water Master Plan.
Implementing Action 3.1.e	Continue to work with Merced Irrigation District and the County of Merced to ensure that adequate water supply and distribution facilities can be developed to meet the growth of the Merced metropolitan area.
Implementing Action 3.1.g	Plan and design water facilities to efficiently serve the City's urban area.
Implementing Action 3.1.h	The City shall not extend water service outside its incorporated limits.
Policy P-3.2	In cooperation with the County and the Merced Irrigation District, work to stabilize the region's aquifer.
Implementing Action 3.2.a	Work closely with the State and County agencies in exploring innovative technology and procedures for water conservation and reuse.
Implementing Action 3.2.b	Work cooperatively with MID to preserve and enhance its surface water delivery system.
Implementing Action 3.2.c	Explore the use of MID water resources for applications that do not require treated water to reduce demand on the regional groundwater supplies and reduce costs of water treatment.
Implementing Action 3.2.d	Cooperate with MID and the County in development of groundwater recharge facilities as called for in the Merced Water Supply Plan.
Implementing Action 3.2.e	Obtain, purchase or preserve rights to open space such as transitioning agricultural lands for proposed major treatment plants, groundwater recharge and storage facilities.
Solid Waste	
Goal P-6	Solid waste management services that accommodate the local population without causing significant damage to environmental resources
Policy P-6.1	Establish programs to recover recyclable materials and energy from solid wastes generated within the City.
Implementing Action P-6.1.a	Implement source reduction and recycling programs to minimize waste at the point of manufacture or use.
Implementing Action P-6.1.b	Work with County officials in seeking federal and state funds for projects utilizing resources and material recovery processes
Implementing Action P-6.1.c	Participate in resource and material recovery studies.

Policy P-6.2	Minimize the potential impacts of waste collection, transportation and disposal facilities upon the residents of Merced.
Implementing Action P-6.2.a	Intermediate processing facilities and materials recycling facilities should be distanced and buffered from sensitive land uses.
Implementing Action P-6.2.b	Cooperate with Merced County to implement recommendations for source reduction programs which have the least environmental and economic impacts on the City and its residents.
Implementing Action P-6.2.c	Continue implementation of programs in cooperation with the County of Merced to meet solid waste diversion goals.

Merced Municipal Code

Chapter 15.42 of the Merced Municipal Code declares a water shortage emergency in the City and prohibits certain uses for water obtained from the water system of the city of Merced. Prohibited uses for water in the city include the washing of outdoor surfaces except when necessary to protect the public health and safety; the washing of the exterior of dwellings, buildings, and structures, the operation of any ornamental fountain or other such structure making use of water from the city domestic water system; and the indiscriminate running of water or washing with water not otherwise prohibited above which is wasteful and without reasonable purpose (Ord. 1842 Section 1 (part), 1993).

4.14.3.1 UC Merced 2009 Long Range Development Plan

The UC Merced 2009 LRDP contains policies that are intended to serve as a guide to future development of the UC Merced Campus. The following policies related to utilities and service systems apply to the Proposed Action and its alternatives.

Triple Zero Commitment (TZC)

TZC-1: Zero Net Energy: Achieve zero net energy by 2020 through aggressive conservation efforts and development of renewable power. Zero net energy means producing the same amount of renewable energy that is consumed. Buildings will be designed to consume half of the energy and demand of other University buildings in California, surpass Title 24 minimum efficiency standards by 30%, and achieve all 10 LEED credits for optimizing energy efficiency.

TZC-2: Zero Waste: Achieve zero landfill waste by 2020. Minimize the generation of solid waste on campus through green packaging purchase requirements and other initiatives to reduce and recycle waste, while undertaking an aggressive recycling program for construction and other campus waste streams.

TZC-3: Zero Net Carbon: Achieve a zero net carbon emissions—carbon neutrality—by 2020. Minimize atmospheric carbon generation by campus operations and employ measures to mitigate carbon emissions such as aggressive tree planting. On-site and regional measures will be prioritized.

Sustainability in Planning, Design and Construction

SUST-1: Adhere to principles of sustainable environmental stewardship, conservation and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations and management.

Architecture

SUST-2: Design campus facilities to achieve US Green Building Council LEED Gold certification at a minimum, when employing all campus base credits. Establish a minimum of 20–25 LEED campus base credits by creating and implementing planning and design standards for all campus facilities and site development. Temporary facilities (less than 15 years life expectancy) shall strive for LEED Silver equivalence, unless recommended for exemption from policy by the Campus Physical Planning Committee and approved by the Chancellor.

SUST-3: Create a unique architectural identity for the campus by employing passive environmental systems, such as shading, orientation and roof configuration, as design features on campus buildings; employing sustainable materials; and designing campus buildings to employ renewable energy production systems.

SUST-4: Design buildings to maximize day lighting, occupant control over the interior environment, indoor air quality, and general indoor environmental quality. Wherever feasible and programmatically compatible, occupied building interiors should be naturally lit and naturally ventilated, as a priority in facility design.

SUST-5: Design buildings to utilize exterior shading to reduce building cooling loads, and utilize circulation systems such as arcades, loggias, or porches to protect major entries to ground floor functions, reducing the need for environmentally conditioned space in areas of high traffic.

SUST-6: Minimize grid connected peak electricity loads by shifting electricity for cooling (approximately 25 percent of total) away from peak electricity demand periods through chilled water thermal storage, gas or cogeneration-driven cooling, and/or solar power.

SUST-7: Install campus energy performance monitoring systems in all new buildings and other monitoring equipment to foster continuous improvement in indoor environmental quality and performance. These systems will enable optimization of campus operations, inform improved design of future phases of the campus, and make the campus a "Living Laboratory" for study of engineering and resource conservation.

SUST-8: Explore the feasibility of achieving water neutrality by determining UC Merced's "water footprint" ([i.e., consumptive use of rainwater [green water], consumptive use of water withdrawn from groundwater or surface water [blue water], and pollution of water [grey water]); Establish water footprint reduction targets for UC Merced and employ mechanisms to offset the environmental and social impacts of residual water footprints, such as, employing state of the art technologies, education, modeling new and cost-effective approaches in design and product selection.

Landscapes

SUST-9: Minimize consumption of potable water resources through the design of landscapes that minimize the use of irrigation water after the plants' initial growing phase, providing for use of recycled water for all irrigation. Explore feasibility of seasonal use of irrigation water from MID.

SUST-10: Design campus landscaping to emphasize regional natives, avoid invasive or allergenic species, and select plantings that are compatible with campus infrastructure, developing a palette of approved plant, ground cover and tree lists, as well as landscape design guidelines.

SUST-11: Utilize tree planting and other methods to shade buildings, walking and open activity areas, and reduce to heat island effects of roads and surface parking lots.

SUST-12: Design roadways, parking lots and circulation pathways to minimize, detain and filter storm water run off.

Services

SER-1: Utilize utility corridors throughout the development of the campus, locating them beneath roadways, open space, or other easily accessed areas.

SER-2: Design underground utility systems for long-term use, with capacity for and service lives of 20 to 50 years.

SER-3: Coordinate the installation and upgrading of information technology underground infrastructure with other underground services.

SER-4: Use life-cycle cost-based design criteria in lieu of first cost in the planning and design of utility systems for campus and for specific projects.

SER-5: Provide for the short-and long-term collection and treatment of campus wastewater, initially by the City of Merced's Wastewater Treatment Facility, with the possible long-term addition of a recycled water treatment facility either on the campus or in the University Community, which will allow the campus to augment its other water supplies and create a source for recycled and industrial water, biomass energy and compost.

SER-6: Minimize water use by permitting spray irrigation only in large turf areas, primarily used for formally landscaped, organized recreation or athletic fields. Irrigation systems will be designed to utilize smart controls, such as using information gathered from local weather stations, and tailored to soil types and plant types, adjusting water distribution on a daily basis as needed, thus minimizing runoff.

SER-7: Provide sufficient access for emergency vehicles to buildings on campus by allowing pathways of adequate configuration.

SER-8: Create a campus district utility plan to enable shared costs of deploying infrastructure.

SER-9: Expand emergency preparedness plans as needed for campus safety and in coordination with appropriate local agencies.

SER-10: Cluster solid waste collection facilities within each neighborhood or district near the points of highest demand to minimize intra-campus transfers and enable the efficient collection and recycling of materials; and away from primary vehicular or pedestrian circulation routes to avoid safety and aesthetic conflicts. Solid waste holding areas shall be screened from public view to the maximum extent feasible, and located so that odors do not impact building inhabitants or users of adjacent active open areas. Screening enclosures shall be integral to, and aesthetically compatible with, adjacent architecture and/or landscape systems.

4.14.3.2 University Community Plan

The University Community Plan (UCP) that was adopted in 2004 contains policies that are intended to guide development of public service facilities within the University Community. The following policies related to utilities apply to the Proposed Action and its alternatives.

Table 4.14-2
UCP Policies

LU 4.8	Extend infrastructure and related services and utilities to urbanizing areas within the University Community only following the adoption of an Infrastructure Master Plan and pursuant to its specification for such infrastructure and services. Such services and improvements shall be limited to the planned development area except where they are necessary to independently or jointly serve the University Community and UC Merced.
LU 9.8	Design any uses, landscape, trails, and improvements located in proximity to MID canals to protect the physical integrity of the canals, levees, and related water conveyance systems.
LU 11.1	Locate and design development in consideration of the University Community's climatic conditions. Examples of techniques that may be considered include: Incorporation of water amenities as a relief from heat, with emphasis on the use of treated gray water
LU 11.3	Promote the use of grading techniques and roof-drainage systems that capture rain water on site and facilitate its use for landscape irrigation and water amenities.
LU 11.4	Promote the re-use of treated wastewater on site (refer to Infrastructure-Water-Related Systems).
H 7.2	Promote the conservation of water through the re-use of treated wastewater, capture and re-use of rainwater, efficient plumbing and fixtures, and use of native and drought-tolerant landscape materials (refer to Infrastructure—Integrated Water Systems and Land Use policies).
ED 9.4	Establish special development impact fee ordinance(s) for the Community Plan area that reflect and internalize the net proportional share of infrastructure costs (roads, parks, schools, utilities, etc.) to new development in the Area.
ED 10.3	Maximize the use of existing facilities in early years, such as schools and certain utilities, which defer major upfront expenditures.
IE 3.5	Require energy efficient appliances, fixtures, and systems (e.g., heating, solar or low emission water heaters, air conditioning, and ventilation) within buildings and residences with energy efficient envelopes (e.g. insulation, insulated windows).

IE 3.6	Encourage the use of energy sources that are not dependent upon electricity generated from nonrenewable resources or natural gas supplies for public utilities, whenever possible.
IW 1.1	Ensure the provision of potable water infrastructure (wells and storage) to provide water supply to meet community needs.
IW 1.2	Require that an adequate water supply be demonstrated before approving new development.
IW 1.3	Require that a water distribution system (line pressure, pump stations, pipes, valves, connections, storage facilities, etc.) be designed, constructed, and operated in accordance with applicable standards prior to occupancy.
IW 1.4	Ensure the provision of water systems that match appropriate water quality to water use requirements.
IW 1.5	Design potable water system to meet federal and state drinking water regulatory standards.
IW 1.6	Required that water supply wells be developed, constructed, and installed in accordance with the American Water Works Association (AWWA) Standards A-100 for Water Wells and the water well standards presented in applicable California Department of Water Resources Bulletins, or the most current standards at the time of development.
IW 1.7	Require that new water sources meet or exceed the DHS Title 22 regulation regarding water quality.
IW 1.8	Require that adequate capacity exists to treat the wastewater flows generated by development and that sufficient capacity is available for the treatment and disposal of sludge before approving new development.
IW 1.9	Ensure the provision of adequate stormwater conveyance and storage infrastructure to accommodate planned development.
IW 1.10	Encourage the provision of on-site wastewater treatment and disposal, where feasible.
IW 1.11	Establish as the highest priority the development of on-site storage for treated wastewater that reduces the need for connections to local community wastewater treatment systems and which maximizes the availability of recycled water for appropriate uses in the University Community, where feasible and timely in consideration of its technology, costs, funding, practicality, and permitting requirements and processes.
IW 1.12	Require that wastewater flows be minimized through water conservation efforts.
IW 1.15	Require the reservation of right-of-way and easements for designated water-related infrastructure facilities as a condition of project approval.
IW 2.1	Ensure the provision of water-related infrastructure systems that allow operation under multiple demand scenarios and emergency conditions.
IW 2.2	Ensure the provision of reliable water supply sources to ensure availability during drought conditions.
IW 2.3	Ensure the provision of water supply, storage, and adequately sized pipelines to provide fire flows at any point within the Community to meet recommendations of the Insurance Services Office (ISO) and/or the County Engineer, while maintaining minimum pressures in accordance with requirements outlined in the California DHS/Waterworks Standards.
IW 2.4	Ensure the provision of reliable water and wastewater treatment processes, with appropriate backup systems.
IW 2.5	Ensure the provision of a reliable water supply system by requiring adequate water storage to meet the needs of the University Community as follows: • Diurnal Operational Needs (for meeting peak flows)—25 percent of peak daily demand • Fire Reserve—provide fire reserve as required by the ISO, California DHS/Waterworks Standards, and the standards of Merced County Emergency Storage—25 percent of average daily demand

IW 3.1	Ensure the provision of water-related infrastructure systems that will enhance the affordability of homes and businesses in the University Community at the time of construction and over the long-term.
IW 3.2	Ensure that water-related infrastructure systems will allow for flexible and phased implementation throughout the buildout of the University Community.
IW 4.1	Promote opportunities for habitat and community enhancement through the beneficial reuse of wastewater.
IW 4.6	Require the inclusion of water reuse infrastructure within building systems and landscape irrigation systems, except where inclusion of such infrastructure is irrelevant or infeasible.
IW 5.1	Implement an active water conservation program in the University Community to reduce future water demand to the extent allowed by law by establishing building requirements for new construction, providing educational information through local media sources, and establishing effective rate changes to encourage conservation.
IW 5.2	Require the use of best available technologies (BAT) for water conservation, including, but not limited to water conserving toilets, showerheads, faucets, and water conserving irrigation systems.
IW 5.3	Require meters for all water connections.
IW 5.4	Encourage the use of recycled water by industrial, commercial, recreational, and agricultural users through the use of incentives (i.e., differential pricing, uninterrupted supply).
IW 5.5	Require the construction of a distribution system for recycled water use that makes recycled water accessible to each developed lot in the University Community.
IW 5.6	Ensure the provision of recycled water at the appropriate quality required for a specific reuse opportunity.
IW 6.2	Ensure the provision of wastewater conveyance and treatment system(s) that minimize energy use.
IW 6.3	Require the use of water supply and distribution and wastewater conveyance and treatment systems and equipment that at a minimum meets mandates for energy efficiency.
IW 6.4	Support the use of gravity flow in lieu of pumping in the design of wastewater and stormwater conveyance systems, wherever appropriate (i.e., align wastewater collection system to follow natural contours on site).
IW 6.5	Support the use of natural systems and rates for treatment of wastewater and stormwater when practical, as opposed to mechanical systems.
IW 7.1	Ensure that water-related infrastructure systems are designed to minimize life-cycle costs, including short term and long-term costs.
IW 7.2	Conduct first cost and present worth analysis of technical options to identify initial and life cycle costs during infrastructure planning and design.
IW 7.3	Ensure that water-related infrastructure systems are designed to maximize the system's "output" for beneficial use (i.e., maximize use of recycled water, capture and use stormwater, etc.), and consider any such cost savings in calculations of life-cycle costs.
IW 7.4	Provide feasible alternatives for seasonal discharge of treated effluent, including on-site water storage and/or connection to a local municipal wastewater treatment facility.
IW 8.1	Require that groundwater extraction does not result in localized groundwater drawdown that will substantially reduce the production rate of existing nearby wells to a level that would not support existing land uses beyond the reasonable life-cycle expectancy and long-term productivity of those wells in the absence of this project.
IW 8.2	Prohibit direct discharge of treated wastewater to surface waters.
IW 8.3	Ensure that wastewater collection and treatment system(s) are designed and constructed to protect groundwater and surface water from contamination by wastewater.

IW 8.4	Ensure that wastewater treatment levels meet standards for intended reuse or discharge point.
ISW 1.1	Require that adequate solid waste collection be provided for commercial, industrial, and residential uses in accordance with state law.
ISW 1.2	Provide for the installation and maintenance of trash and recycling receptacles along streets in commercial areas and along major arterials; design receptacles to be aesthetically compatible with the district in which they are located.
ISW 1.3	Investigate the feasibility of implementation of joint solid waste collection with UC Merced.
ISW 2.1	Ensure that future developments are consistent with the requirements of the Merced County Integrated Waste Management Summary Plan.
ISW 2.2	Encourage the development of recycling programs for solid wastes from non-residential uses in the University Community and ensure that they are recycled at an approved materials recycling facility.
ISW 2.3	Maximize curbside recycling opportunities for yard wastes and other recyclables.
ISW 2.4	Support programs that promote home composting.
ISW 2.5	Collaborate with UC Merced in the implementation of recycling, composting, and source reduction programs.
ISW 2.6	Promote community awareness of recycling and composting program activities and services in coordination with the County of Merced, City of Merced, Merced County Association of Governments (MCAG), and UC Merced.
ISW 2.7	Require that developers work with the Solid Waste Division of Merced County to implement recycling programs for construction materials to reduce the amount of waste disposed of at the landfill.

4.14.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

The President's Council on Environmental Quality (CEQ) guidance for evaluating the types and significance of impacts under National Environmental Protection Act (NEPA) is summarized in **Section 4.0.** For purposes of this analysis, this Draft EIS/EIR conservatively uses significance criteria derived from Appendix G of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* and the CEQ guidelines regarding the determination of environmental consequences to identify impacts. In accordance with NEPA, the EIS also must evaluate potential effects on the human environment which includes an analysis of the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). For potential impacts thus identified, both NEPA guidance and CEQA thresholds are used to evaluate the significance of each impact. For the purpose of this Draft EIS/EIR, impacts related to utilities and services systems would be significant if implementation of the Proposed Action or its alternatives would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB);
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Have insufficient water supplies available to serve the project from existing entitlements and resources, or new or expanded entitlements;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Fail to comply with federal, state, and local statutes and regulations related to solid waste.

Issues Not Discussed Further

The following checklist items under Appendix G of the *State CEQA Guidelines* are not discussed in the following impact analysis.

- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Storm water drainage facilities are discussed in **Section 4.8, Hydrology and Water Quality**, of this Draft EIR/EIS.

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (RWQCB).

This standard relates to the water quality effects from the discharge of treated effluent generated by the Proposed Action. This issue is addressed in **Section 4.8, Hydrology and Water Quality**, of this Draft EIS/EIR.

4.14.5 Methodology for Evaluating Effects

As noted earlier, both the Campus and University Community under the Proposed Action are located within incorporated Merced County at this time. A portion of the campus site, including the Phase 1.1 Campus, is within the City's SOI and therefore can receive City services on an interim basis under an extraterritorial services agreement. Phase 1.1 Campus is currently provided sewer and water service by the City under such an agreement.

The analysis presented below is for the conditions that would exist at buildout of the Campus and the University Community. To evaluate potential impacts on utility systems, the Proposed Action's demand

for utilities was estimated and compared to the available existing and future capacity in the City's utility systems. The potential for each alternative to increase demand was also evaluated and the effects of that increased demand on utilities and services systems were evaluated.

Potable Water and Water for Fire Protection

As shown in **Table 4.14-3, Summary of Indoor Potable Water Demand,** at full development the Proposed Action would require an estimated 4,041 acre-feet/year of potable water. This includes residential and academic use and water for cooling purposes.

Table 4.14-3
Summary of Indoor Potable Water Demand

Development Area	Projected Indoor Water Demand (High Water Conservation) (Acre-Feet/Year)
Campus Total[1]	1,611
Community North Total[2]	1,141
Community South Total[3]	1,289
Total Indoor Potable Water Demand	**4,041**

Source: Stantec, Inc. 2008

[1] Based on 15 gallons per day (gpd) per person and 55 gpd per bed

[2] Based on 15 gpd per employee, 55 gpd per resident and 10 gpd per elementary, middle and high school student

[3] Based on 20 gpd per employee, 70 gpd per resident and 10 gpd per elementary, middle and high school student

Irrigation

The proposed Campus and University Community would require 3,125 acre-feet/year of water for irrigation of turf grass and other landscaping, as shown in **Table 4.14-4, Summary of Outdoor Potable Water Demand.**

Table 4.14-4
Summary of Outdoor Potable Water Demand

Development Area	Projected Annual Outdoor Water Demand for Irrigation (Acre-Feet/Year)[1]
Campus Total	776[2]
Community North Total	786[2]
Community South Total	1,563[3]
Total Outdoor Potable Water Demand	**3,125**

Source: Stantec, Inc. 2008
Note: Assumes high degree of water conservation
[1] Percent of acreage that is irrigated is based on land coverage percentage projections by Clascape, May 30, 2008
[2] Based on an irrigation rate of 3.0 feet per year for turf and 2.5 feet per year for non-turf uses
[3] Based on an irrigation rate of 4.0 feet per year for turf and 3.0 feet per year for non-turf uses

Wastewater

Water use and wastewater flows are related. In general, wastewater is generated from indoor water uses, and thus, is affected by water conservation efforts. The estimates of wastewater that would be generated assume that 90 percent of indoor water demand and 30 percent of cooling water demand would become wastewater. Based on projected water demand from **Table 4.14-3**, the proposed Campus and University Community would generate approximately 3.09 mgd of wastewater, as shown in **Table 4.15-5, Summary of Wastewater Generation.**

Table 4.14-5
Summary of Wastewater Generation

Development Area	Projected Wastewater Generation (mgd)[1]
Campus[2]	1.13
Community North	0.92
Community South	1.04
Total Wastewater Generation	**3.09**

Source: Stantec, Inc. 2008
Note: Assumes high degree of water conservation
1 Based on 90% of Annual Indoor Water Demands
2 Assumes that 30% of cooling water is discharged directly to the sewer system

Solid Waste

In 2007, the on-campus population of approximately 2,360 persons generated about 618 tons of municipal solid waste that required disposal at a landfill. Based on existing waste generation rates, the on-campus population would generate about 8,425 tons of solid waste per year at full development. Furthermore, the 2009 LRDP includes a policy committing the campus to produce by 2020 no municipal solid waste that requires landfill disposal.

Based on the waste generation factors provided by Merced County, this Draft EIS/EIR estimates solid waste generated by the residential population in the University Community at the rate of 11.2 pounds/day per single-family housing unit and 5.3 pounds/day per multi-family housing unit, and 21 pounds/day for each 550 square-foot area of commercial and office uses in the University Community (Merced County 2008). As shown in **Table 4.14-6, Summary of Solid Waste Generation**, the University Community land uses would generate about 46,781 tons of solid waste per year at full development.

Table 4.14-6
Summary of Solid Waste Generation

Land Use	Solid Waste Generation Rate	Units	Solid Waste Generation	
			Pounds per day	Tons per year
Campus				
Campus	0.26 tons/person/yr	32,185 persons[1]	-	8,368
University Community				
Single-Family Residential	11.2 pounds/dwelling unit/day[2]	8,803 dwelling units	98,594	17,993
Multi-Family Residential	5.3 pounds/dwelling unit/day[2]	2,814 units	14,914	2,722
Retail, office and Research Uses -	21 pounds/550 square feet/day[2]	3,696,700 square feet	141,147	25,759
Schools	5 pounds/student/day[3]	3,360 students	1,680	307
University Community Subtotal	-	-		46,781
Total Solid Waste Generation				**55,145**

1 Includes students, staff and faculty
2 Source: Merced County 2008
3 Source: CIWMB2007

4.14.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.14.6.1 Alternative 1 – Proposed Action

Alt 1– Impact UTILS-1: The Proposed Action would generate demand for potable water that would be met with existing resources. (*Less than Significant*)

Campus

The Campus would generate a demand for 1,611 acre-feet per year of potable water for indoor uses at full development (Stantec 2008). This estimate assumes a high degree of water conservation based on best management practices (BMPs) developed by the California Department of Water Resources for conserving water, and compliance with State and Federal plumbing fixture requirements (UC Merced 2002; County of Merced 2004). Various types of water conservation methods are practiced at existing University of California campuses, and would be included in the campus design plans for UC Merced. These methods include water conservation awareness campaigns, installation of water-efficient bathroom fixtures, water-efficient practices for irrigation, and regular monitoring of water usage. Campus plans also include using reclaimed water from an on-campus or nearby recycled water plant for irrigation and toilet flushing.

The landscape irrigation water demand for the campus at full development is estimated at 776 acre-feet per year. The design of the proposed campus includes irrigation water conservation measures such as heavy mulching, landscaping with native, drought-resistant plants, and drip irrigation systems. Therefore, this estimate assumes a high degree of conservation for irrigation water. Rather than utilize potable water for irrigation purposes, the University will evaluate the feasibility of developing a recycled water plant either on the campus or in Community North which would supply water for irrigation uses. In addition, the University plans to execute an agreement with MID to obtain irrigation water from MID canals. The campus drainage design also includes on-site retention facilities to store storm water runoff from winter storms for irrigation use later in the year. However, the amount of storm water that would be available for irrigation would vary with rainfall and it is not certain at this time when the wastewater treatment and recycling plant would come on line. Similarly, it is uncertain at this time as to whether a recycled water plant will be constructed (either on or off campus) and by when, and whether all the needed irrigation water will be available from MID. Therefore conservatively, this Draft EIS/EIR assumes that potable water would be used for irrigation and therefore the total demand for potable water at full campus development, including irrigation water demand, would be 2,387 acre-feet per year. Currently, the campus consumes 159 acre-feet per year of water; therefore, the net increase in demand with Campus

build-out is estimated at approximately 2,228 acre-feet per year. Please refer to **Appendix 4.14** for a detailed description of the water demand associated with the campus. The potential for the project to the substantially deplete groundwater supplies is analyzed in detail in **Section 4.8, Hydrology and Water Quality.**

University Community

Full development of the proposed University Community would generate demand for 4,776 acre-feet per year of potable water for indoor and outdoor uses, including 1,927 acre-feet per year for Community North and 2,852 acre-feet per year for Community South.

This estimate takes into account a high degree of water conservation for Community North. For indoor uses, these conservation practices would include installation of ultra low flush toilets, low-flow showerheads, low water-use washing machines, and installation and maintenance programs to ensure a high degree of water conservation. In order to minimize outdoor water demand, drought tolerant plant species and turf would be used for landscaping (Merced County 2004).

A typical degree of conservation for Community South is used to estimate water demand because the University cannot assume that the development within Community South would implement the same degree of conservation as the Campus and Community North. For the purposes of this analysis, it is assumed that water would be supplied from on-site wells.

Conclusion

The 2005 UWMP anticipates that the Campus would demand approximately 8,073 acre-feet per year by 2025, while uses in the City would demand approximately 47,604 acre-feet per year. This demand is based on the build-out of the water service area within the City's Specific Urban Development Plan, in addition to the Campus.

The total demand of 2,387 acre-feet per year associated with the Campus is well below the amount anticipated in the 2005 UWMP. If the water demands associated with the Campus and University Community at buildout are combined, the Proposed Action would demand 4,122 acre-feet per year above existing demands on the site, or a total of 7,166 acre-feet per year. As stated above, the City anticipated that development of the Campus would demand about 8,073 acre-feet per year at full development. Therefore, water demands associated with the combined development of the Campus and University Community would be accounted for in the approved 2005 UWMP and the impact to water resources would be less than significant.

The 2005 UWMP found that the City of Merced has an adequate groundwater supply to meet water demands during normal, single-dry, and multi-dry years. Note that the availability of water within the aquifer does not vary significantly in relation to wet or dry years or seasonal climate shortages. Therefore, groundwater quantity is assumed to be generally unaffected by the short-term drought conditions. In addition, a ground water contingency plan, which prohibits certain uses of water, was implemented in 1993 in response to the drought in the late 1980s and remains in effect. The City of Merced and MID are cooperating on a long-range plan to stabilize groundwater levels. This includes investigations on the potential recharge of the regional aquifer with imported water from the Merced River (City of Merced 2005). Given the above, if the total demand of water for the Proposed Action is added to existing conditions, the resultant values show that no new entitlements and resources would be needed to serve the water demands of the proposed Campus. The Campus's impact to water supply is considered less than significant.

For reasons presented above, the impacts of the Proposed Action related to water supply would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1– Impact UTILS-2: The Proposed Action-related demand for potable water for indoor and outdoor uses would require the construction of new water supply and conveyance facilities; these facilities would not result in significant impacts on the environment. (*Less than Significant*)

Campus

As described above, it is anticipated that the City of Merced would continue to provide water to the campus in the long term. The existing 16-inch water supply line located within the roadway alignment of Bellevue Road in addition to the on-campus well would meet fire flow requirements and assure water supply to the campus in the event the campus well is taken off line for any reason. No improvements to this water line or an additional water line to serve the campus at full development would be needed. The existing campus well that can be operated at a pumping rate of 3,000 gpm would be adequate to serve the needs of the campus at full development and an additional well would not be needed. The existing on-campus distribution system would be expanded to deliver potable water to areas outside the Phase 1.1 Campus. Water mains would be placed under the secondary roads, with branch lines for fire hydrants and future building sites. These water mains would be sized to accommodate long-range development of the campus. A large water storage tank has been constructed on the Phase 1.1 Campus near the campus well. Additional storage tanks would be constructed on the campus as needed to serve the growing

campus' fire flow requirements. The environmental impacts from the development of on-site water infrastructure, including the effects of pumping groundwater, are evaluated in other sections of this Draft EIS/EIR and those impacts that are found to be significant are mitigated by the mitigation measures included in those sections.

As noted above, construction of additional off-site water infrastructure is not anticipated as part of the campus construction. Therefore, there would be no environmental impacts from the construction of off-site water infrastructure. In summary, the environmental impact related to provision of potable water to the campus is considered less than significant.

Government Code Section 54999 authorizes public utilities to charge the University a limited capital facilities fee under certain circumstances (i.e., a non-discriminatory charge to defray the actual cost of that portion of a public utilities facility actually serving the University). In the event that there are any costs incurred by the City associated with the provision of water to the campus, the University will comply with its obligations as authorized under Section 54999.

University Community

If the University Community is annexed, it would be connected to the City of Merced water supply system. Similar to the campus and other areas within the City's water service area, groundwater would be the source of potable water in the University Community. It is estimated that at least three groundwater wells, with one well for every 1 square mile, would be required to serve the University Community. Wellhead treatment, water storage tanks, and a water distribution system would be constructed on the University Community site. It is anticipated that all new wells would be constructed within the University Community site and would be located within parks or commercial areas so that they could be designed to blend in easily with their surroundings. Water treatment would occur at the wellhead and would include chlorination and fluoridation. Based on pumping data from PG&E tests of wells in the area, it is anticipated that each well constructed for the proposed University Community could provide a flow rate in the range of 1,500 gpm. Assuming 1,500 gpm, approximately three wells would be required to provide the University Community with water to meet maximum day demand, provide backup production capacity, peak hour delivery, and the ability to cycle operations of the supply wells. However, under County practice, wells are typically sized to meet the maximum day demand with one well out of service. Therefore, assuming three wells would be required to provide sufficient supply; four wells and associated storage are assumed for the University Community (Merced County 2004). Since the Campus has a service agreement with the City, the 16-inch water supply line serves as backup for Well Number 17. For the purposes of this analysis, it is assumed that the University Community would have four wells regardless of whether it is annexed to the City.

Chapter 9.28 of the Merced County Code addresses the location, construction, maintenance, and abandonment of water wells, monitoring wells, and cathodic protection wells. The Code requires permits from the County Health Officer for all actions involving wells and establishes standards for the construction, repair, abandonment or destruction of wells. Policy IW 1.1 would require that wells (and storage tanks) be provided to meet the water supply needs of the University Community. UCP Policy IW 1.6 would ensure that water wells would be adequately developed, constructed, and installed in accordance with the American Water Works Association (AWWA) Standards A-100 for Water Wells and the water well standards presented in the State Department of Water Resources Bulletin 74-81, as amended by Bulletin 74-90, or the most current standards at the time of well development. UCP Policy IW 1.7 would ensure that potable water would meet or exceed Title 22 water quality requirements for potable water. UCP Policy IW 1.5 would require that the potable water system be designed to meet federal and State drinking water standards. UCP Policy IW 13.3 would require the implementation of monitoring programs to ensure water sources consistently comply with drinking water regulations. UCP Policy IW 1.4 would ensure provision of water systems that match appropriate water quality to water use requirements. UCP Policy IW 10.2 would ensure that water systems are designed to anticipate changes in the demand for water of different quality parameters. These policies would ensure an adequate safe drinking water supply for the University Community (Merced County 2004).

In order to ensure adequate storage and distribution infrastructure, the UCP includes Policy IW 13.4, which would require that a five-year lead-time be maintained in the planning of water system improvements. UCP Policy IW 2.3 would require that water supply, storage, and pipelines be adequately sized to provide fire flows at any point within the University Community area to meet recommendations of the Insurance Services Office (ISO) and/or County Engineer while maintaining minimum pressures in accordance with State standards. UCP Policies IW 1.14, 2.1, 2.4, 2.5, 11.2, 11.4, 11.7, 11.8, 13.1, 13.2, and 13.4 would ensure that the design and construction of facilities serve the needs of the University Community and that the water systems are designed to conform to local jurisdictional standards. UCP Policy IW 10.1 would ensure that long-term plans for the design and construction of water-related infrastructure include flexibility to allow for changes in technology, funding and/or management. UCP Policy IW 11.1 would require that the University Community water supply infrastructure supply system be consistent with regional water supply plans, in particular the Water Supply Plan. These UCP policies would ensure that the water distribution and storage system is designed, constructed, and operated in accordance with applicable standards and would meet University Community needs (Merced County 2004).

Future development within the University Community will comply with applicable federal, State and local regulations and UCP policies, and therefore the necessary new and/or expanded water supply

extraction, treatment and distribution facilities would be developed on site. The environmental impacts from the construction of on-site water supply and distribution facilities are addressed in the other sections of this Draft EIS/EIR, including the effect of groundwater extraction in **Section 4.6, Hydrology and Water Quality**, and those impacts that are found to be significant are mitigated by the mitigation measures included in those sections.

Conclusion

For reasons presented above, the impacts of the Proposed Action related to water infrastructure and conveyance would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1– Impact UTILS-3: The Proposed Action would generate additional wastewater flows but would not require construction or expansion of new wastewater conveyance or treatment facilities; nor would the Proposed Action result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to existing commitments. (*Less than Significant*)

Campus and Community

The proposed project is currently located in unincorporated Merced County and, with the exception of a portion of the campus site, is not connected to or served by the City of Merced WWTP. Wastewater generated on the Phase 1.1 Campus is currently discharged to the City of Merced sewer system and is treated at the City's WWTP. It is anticipated that wastewater from the next phase of campus development would also be discharged to and treated at the City's WWTP. With respect to the remainder of the campus and all of the University Community, as noted in **Section 2.0, Project Description**, two scenarios are under consideration for the treatment and disposal of wastewater generated by the remaining portion of the Campus and all of the University Community. Under one scenario, all wastewater generated within these areas would be collected and conveyed to the City of Merced WWTP for treatment and disposal, and under the other scenario, all wastewater generated within the Campus and University Community would be collected and conveyed to an on-site wastewater treatment facility for treatment and disposal. The potential need to construct additional conveyance and treatment facilities to serve the Proposed Action under either scenario is described below along with an evaluation as to whether the construction of these facilities would result in significant environmental impacts.

Impact related to City of Merced Wastewater Treatment Plant

The City has committed to provide wastewater treatment service to the campus (UC Merced 2002). Wastewater flows from the Phase 1.1 Campus are currently conveyed to the City's WWTP for treatment and disposal via a 27-inch sewer main that was installed in 2004 along Bellevue Road to connect the campus' collection system to the City's collection system. It is anticipated that wastewater from the next phase of campus development would also be conveyed and treated in the City's WWTP either under a new or revised services agreement or after annexation.

At full development, the campus would generate approximately 1.13 mgd of wastewater. Assuming that all the wastewater from the campus at full development were to be treated at the City's WWTP, and assuming that there were no increases in flows to the WWTP from other sources, the existing WWTP would be adequate to serve the full campus.

In the event that the University Community area is also annexed to the City, on-site treatment capacity would not be established and Community North and Community South would be connected to the City's sanitary sewer system for treatment and disposal of wastewater. As shown in **Table 4.14-5,** the University Community would generate approximately 1.96 mgd of wastewater flows at buildout. If it is assumed that there are no increases in flows to the City's WWTP from other sources, the WWTP would have adequate capacity to serve the full University Community once the approved expansion is implemented.

If the wastewater flows from the Campus and University Community are combined, the total flows as a result of the Proposed Action would be 3.09 mgd at buildout. The WWTP currently operates at a rate of 8.5 mgd. Therefore, wastewater flows anticipated as a result of the Campus and University Community would increase existing wastewater flows to approximately 11.59 mgd. As noted earlier, the City has approved the expansion of the capacity of its WWTP to 20 mgd. This WWTP expansion will be implemented to serve regional population growth with and without the campus. If it is assumed that there are no increases in flows to the WWTP from other sources, the expanded WWTP would be adequate to serve the combined Campus and University Community wastewater demands.

With respect to the wastewater conveyance lines, the existing sewer pipeline along Bellevue Road is adequately sized to serve the flows from the campus at full development; however, the 27-inch sewer line along G Street can only handle flows from a 10,000-FTE campus. Therefore, off-site improvements will be needed to convey wastewater from the campus to the City's WWTP. Similarly, a new sewer line would be required to convey flows from the University Community to the City's WWTP. One of three alternate alignments would be used to construct this sewer line along Cardella Road and Thornton Road, along Yosemite Avenue and Kibby Road, or along Campus Parkway. The construction of a wastewater line

connection to the City's wastewater conveyance system along any of these roadways above would not result in significant impacts to environmental resources. The installation of these sewer pipelines would be consistent with the City's practice of placing utility lines within roadway shoulders or under the pavement. The environmental impacts of all off-site improvements are discussed in other sections of this Draft EIR/EIS. Because these improvements would be located in already disturbed environments along city roads, the construction of these pipeline improvements would not result in significant environmental impacts. To serve development within the portion of the Campus or Community North, south of the Bellevue Road alignment, an interim pump station could be needed to pump wastewater to the sewer pipeline in Bellevue Road. Impacts from the construction and operation of the interim pump station are also discussed in other sections of this Draft EIS/EIR. Therefore, the impacts related to the provision of wastewater service and associated infrastructure to the Proposed Action would be less than significant.

Furthermore as stated earlier, Government Code Section 54999 authorizes public utilities to charge the University a limited capital facilities fee under certain circumstances. The University will comply with its obligations as authorized under Section 54999. This fee (i.e., a non-discriminatory charge to defray the actual cost of that portion of a public utilities facility actually serving the University) covers the Campus' share of construction cost, including the cost of mitigation measures to address environmental impacts from the construction of improvements, should any off-site improvements be necessary.

Impact related to On-Site Treatment of Wastewater

As discussed in **Section 2.0, Project Description,** UC Merced will evaluate the feasibility of on-site wastewater treatment and recycling, using conventional or emerging technologies. Numerous policies in the UCP also address wastewater. UCP Policy IW 1.8 would require that, prior to approval of specific plans, adequate capacity for wastewater treatment be assured. Implementation of UCP Policy IW 1.10 would encourage on-site treatment of wastewater, if possible. UCP Policies IW 11.8 and 11.9 would encourage joint facilities with the UC Merced Campus. UCP Policy IW 13.4 would ensure that future improvements are planned and included in the County's Capital Improvement Program (Merced County 2004). Modular, small-scale treatment systems have recently been developed that allow for the treatment and recycling of wastewater streams. Recent industrial-scale applications of these technologies show water recycle rates of up to 95 percent of the wastewater flow volume. The recycled water in these applications is treated to better than potable water standards. Depending on the level of treatment, the Campus and University Community could use the recycled water for irrigation, industrial water (e.g., cooling tower water makeup) or as an additional potable water supply. With up to 95 percent of the recycled water used for irrigation and industrial water uses, the remaining 5 percent would be discharged to the sanitary sewer system and therefore unlike conventional WWTPs, such a system would require no land or stream discharge of treated effluent. In the event that the University Community site is

not annexed to the City, it is anticipated that a Zero Liquid Discharge (ZLD) system would be evaluated for implementation to eliminate discharge of the remaining 5 percent of wastewater from the wastewater treatment system. In the event that a conventional WWTP is constructed it is anticipated that it would treat the effluent to Title 22 requirements so that the treated effluent can be piped to nearby agricultural fields, or used for on-site irrigation or water ground recharge. Environmental impacts of this system are generally described in other sections of this Draft EIS/EIR and determined to be less than significant. As and when a wastewater treatment and recycling system is planned, it would be subject to further environmental review.

Conclusion

For reasons presented above, the impacts of the Proposed Action related to wastewater conveyance and treatment would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1– Impact UTILS-4: Implementation of the Proposed Action would generate solid waste that would not require the expansion of the regional landfill. (*Less than Significant*)

Campus

In 2007, the on-campus population of about 2,360 generated about 618 tons of municipal solid waste. Of this, approximately 69 percent was recycled or otherwise diverted and about 31 percent was sent to the Merced County Highway 59 Landfill. Under the Proposed Action, the on-campus population would increase to 32,185 by 2030. Based on existing disposal rates, the on-campus population at buildout would generate about 8,368 tons of solid waste per year, of which about 30 percent would require disposal at Highway 59 Landfill. Although the University of California is exempt from the 1989 Integrated Waste Management Act (AB 939), in 2007, the University of California adopted the Policy on Sustainable Practices, which sets waste diversion goals of 75 percent by June 2012 and zero waste by 2020 for UC campuses. The UC Policy on Sustainable Practices also encourages recycling of construction waste. Furthermore, the 2009 LRDP includes a policy committing the campus to produce no landfill waste by 2020. Together these policies would minimize the amount of solid waste that would go to the County landfill.

It is anticipated that the Highway 59 Landfill capacity will be reached in approximately 2035. While full development of the campus would generate more solid waste than existing conditions, it is anticipated that eventually no solid waste would be disposed of in a landfill. In the event that the campus does not

meet its zero waste goal, based on the existing diversion rate of 69 percent, the campus would dispose of 2,594 tons of waste in the landfill at buildout. This is about 1 percent of total waste accepted at Highway 59 Landfill, which accepts 160,000 tons per year. Because the campus anticipates that 100 percent of solid waste would be diverted from the landfill, and there is adequate capacity available in the landfill and landfill expansion would not be required, this impact would be less than significant.

University Community

The proposed University Community would generate approximately 46,781 tons per year (or approximately 128 tons per day) of solid waste at full buildout (see **Table 4.15-6)**. With a diversion factor of 50 percent (which could be accomplished through construction waste reduction, diversions of recyclables from resource recovery areas at the landfills, and the reduction of wood and green wastes from the composting facility at the Highway 59 Landfill and from curbside green waste collection), in accordance with AB 939 requirements, approximately 23,391 tons per year (or approximately 64 tons per day) would be disposed at the Highway 59 Landfill (Merced County 2004). In 2004, the actual diversion rate for the Merced County Solid Waste Regional Agency was 69 percent (CIWMB 2008). Using the 2004 diversion rate, approximately 14,502 tons per year (or approximately 40 tons per day) of solid waste generated by the University Community would be disposed at the county landfill. The landfill currently has a maximum permitted rate of disposal of 1,115 maximum tons per day (CIWMB 2008). Therefore, the landfill would have the capacity to accept solid waste from the University Community at either a 50 percent or 69 percent diversion rate.

Implementation of UCP Policies ISW 1.1 would ensure provision of solid waste collection in accordance with state law and County policy. Implementation of UCP Policies ISW 1.2 and 2.1 through 2.7 would promote recycling opportunities as an integral part of the University Community. These measures would reduce the amount of waste disposed by the University Community. Because UCP policies would decrease the amount of solid waste being disposed at the landfill and the increase in solid waste generated in the University Community would not require the expansion of existing, or construction of a new landfill, this would be considered a less-than-significant impact.

Conclusion

For reasons presented above, the impact of the Proposed Action related to solid waste infrastructure would be less than significant.

Mitigation Measure: No mitigation is required.

Alt 1– Impact UTILS-5: Implementation of the Proposed Action would require on- and off-site improvements to electric transmission lines and natural gas pipelines. (*Less than Significant*)

Campus

Electricity to the Phase 1.1 Campus is currently provided via a connection to the electrical grid. The maximum electric demand at full development of the campus is estimated at 18 MW. This estimate is based on an "energy efficient scenario," which requires buildings to exceed the basic requirements of Title 24 Energy Code. Given the importance of energy efficiency to Green Building design, the UC Policy on Sustainable Practices sets a goal for all new building projects, other than acute-care facilities, to outperform the required provisions of Title 24 energy-efficiency standards by at least 20 percent. At UC Merced, a more ambitious goal of outperforming Title 24 energy efficiency standards by 30 percent has been set. Current campus buildings, which employ an array of design and technological strategies to minimize and manage campus energy consumption, are using approximately 50 percent less energy than Title 24 standards. The design of new buildings would follow appropriate building design requirements, such as passive solar design, and utilize energy-efficient methods and appliances, such as solar hot water systems and low-flow showerheads. In addition, all new buildings would incorporate energy conservation measures.

In compliance with UC Policy on Sustainable Practices, power that will be needed by the campus at buildout will be obtained from a number of renewable and alternative technologies, including wind turbines, fuel cells, and photovoltaic systems. Furthermore, the 2009 LRDP includes a policy committing the campus to consume no off-site or non-renewable energy by 2020. Note that the Campus is planning to install a solar panel facility in the eastern portion of the campus as part of the next phase of campus development (UCM 2020 project), and the environmental impacts of that project are evaluated in Volume 3 of this Draft EIS/EIR. However, service from the grid would still be maintained for redundancy and reliability and the grid would also be the source of electricity while on-site alternate electricity sources are being developed. Therefore it is anticipated that a new 115 kV transmission line would be developed to serve the Campus and the University Community as the demand for power increases. The potential alternate routes that are considered likely for this power line are shown in **Figure 2.0-6** in **Section 2.0, Project Description**. The visual environmental impacts of a high voltage power line such as this line are evaluated in **Section 4.1, Aesthetics**. The footprint impacts of the off-site and the on-site portions of this power line are evaluated in the Biological Resources, Cultural Resources, and other sections of this Draft EIS/EIR. Mitigation measures are included in these sections for any significant impacts that are identified. Note that as and when such a power line is actually proposed, the environmental impacts of the project will be evaluated in detail by PG&E.

With respect to environmental impacts from the off-site generation of electricity that would be used by the campus, there is no evidence that the limited amount of electricity that may be purchased by the campus from the grid would result in the need for new electric and/or natural gas generating facility, such as a power plant. Because electricity and natural gas can be transmitted for long distances, it can be obtained from a wide range of sources, both in and out of California. As a result of this characteristic, it would be speculative to assume development of the campus would generate the need for a new electric generating facility, or where new facilities would be located, or to evaluate environmental impacts resulting from the construction and operation of new facilities in California. In addition, an environmental document that analyzes and discloses environmental impacts from the construction and operation of any new power plants and imposes mitigation measures as conditions of project approval to address significant impacts would be prepared before new power plants are approved (UC Merced 2002). Note that greenhouse gas emissions from the generation of electricity to serve the campus are included in the estimate of the Proposed Action's greenhouse gas emissions and are reported and evaluated in **Section 4.16, Global Climate Change**.

The maximum gas demand for the campus at full development is projected to be approximately 1,020 therms/hour. In 2007, the annual campus demand for natural gas was 100 therms/hour. Should additional connections be needed as the demand for gas on campus increases overtime, PG&E would put a gas line along the Campus Parkway. Environmental effects from the construction of off-site utilities are discussed in the other sections of this Draft EIS/EIR, and have been determined to be less than significant.

University Community

Development of the University Community would create new demand for electricity and natural gas. According to the 2004 UCP EIR, development of the University Community would result in an annual demand for approximately 48 MW of electricity and 30.5 million thermal units of natural gas. University Community development would be required to comply with Title 24, California Code of Regulations, to reduce overall energy demand. The UCP includes policies that encourage development of energy systems that maximize conservation and minimize energy use, and policies that encourage the use of alternative supply (distributed generation) sources (UCP Policies I.E. 1.2, 1.4, 1.5, 3.2, 3.6, 4.1, 4.2, and 4.6). UCP Policy IW 6.3 requires the use of equipment that meets or exceeds minimum mandates for energy efficiency. UCP Policy IW 6.5 encourages the use of natural versus mechanical systems in wastewater, water and storm drain conveyance systems. These policies would reduce the overall demand for electricity and natural gas required to serve the University Community. Therefore, the University Community would not result in wasteful, inefficient and unnecessary consumption of energy during construction or operations, and this would be a less-than-significant impact.

There are two potential public utility providers that could provide electricity to the University Community area: PG&E and MID. Natural gas would be provided to the University Community area by PG&E. As noted above, a high voltage power line would be installed to serve the campus. It is anticipated that the same transmission line would also serve the University Community. Environmental impacts from the construction and operation of that power line as noted above are evaluated in other sections of this Draft EIS/EIR. The discussion above related to environmental impacts from off-site generation of power to serve the campus also applies to the University Community.

Conclusion

For reasons presented above, the impact of the Proposed Action related to electrical and natural gas infrastructure would be less than significant.

Mitigation Measure: No mitigation is required.

4.14.6.2 Alternative 2 – Yosemite Avenue

Water Service

Because the development under Alternative 2 would be substantially the same as that under the Proposed Action, the impact related to water supply and conveyance would be less than significant because the alternative's location with respect to existing wells and water supply lines are substantially similar.

Wastewater

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts related to wastewater conveyance and treatment would be less than significant.

Solid Waste

Because the development under this alternative would be substantially the same as that under the Proposed Action, solid waste generation from the Campus and University Community would be similar and the impact would be less than significant.

Electricity and Natural Gas

Development under Alternative 2 would be similar to the Proposed Action, in terms of its location with respect to existing utilities. Therefore, the environmental impacts of this alternative related to on-site and

off-site improvements, including the extension of electric transmission lines and natural gas pipelines would be less than significant.

4.14.6.3 Alternative 3 – Bellevue Ranch

Water Service

Alternative 3 is identical to Alternative 1, Proposed Action in terms of the size of the Campus and University Community population. Therefore, the environmental impacts of this alternative related to demand for potable water service would be generally similar to those described above for the Proposed Action. The impacts related to water supply would be less than significant.

Wastewater

Because Alternative 3 is identical to the Proposed Action in terms of the size of the Campus and University Community population, wastewater generation under this alternative would be substantially the same as that under the Proposed Action. Therefore, the environmental impacts of this alternative related to demand for wastewater treatment services both on site and off site would be less than significant.

Solid Waste

Because Alternative 3 is identical to the Proposed Action in terms of the size of the Campus and University Community population, solid waste generation under this alternative would be substantially the same as that under the Proposed Action. Therefore, the environmental impacts of this alternative related to solid waste would be less than significant.

Electricity and Natural Gas

Because Alternative 3 is identical to the Proposed Action in terms of the size of the Campus and University Community population, electricity and natural gas demand under this alternative would be substantially the same as that under the Proposed Action. The Bellevue Ranch Alternative is adjacent to the existing high voltage power lines that would be tapped to supply power to the Campus and University Community. Therefore, under this alternative, no new transmission line would be needed to provide power at this site. The environmental impacts of this alternative related to on-site and off-site improvements, including extension of electric transmission lines, would be less than significant.

4.14.6.4 Alternative 4 – 2002 Proposed Project

Water Service

Alternative 4 is identical to Alternative 1, Proposed Action in terms of the size of Campus and University Community population and because water demand impacts are related to the size of project population, these impacts would be similar to those under Alternative 1. This alternative is also at the same location as the Proposed Action. Therefore, the environmental impacts of this alternative related to water service would be the same as those described above for the Proposed Action. This would be a less than significant impact.

Wastewater

Because the development under this alternative would be substantially the same as that under the Proposed Action, impacts related to wastewater service would be less than significant.

Solid Waste

Because the development under this alternative would be substantially the same as that under the Proposed Action, solid waste generation from the Campus and University Community would be similar. This is considered a less-than-significant impact.

Electricity and Natural Gas

Development under Alternative 4 would be similar to the Proposed Action, in terms of its size and location. Therefore, the environmental impacts of this alternative related to on-site and off-site improvements, including the extension of electric transmission lines and natural gas pipelines, would be less than significant.

4.14.6.5 Alternative 5 – No Action

Water Service

Under this alternative, the Campus and Community North would not be built, although Phase 1.1 Campus would continue to operate at its current location. Therefore, development under this alternative would be similar to the Proposed Action in terms of location but would be smaller in terms of population. The types of water conveyance and supply impacts that would result under this alternative would be similar to those of the Proposed Action but the magnitude of the impacts would be smaller because a

smaller population would be associated with this alternative from the development of Community South. This is considered a less than significant impact.

Wastewater

Under this alternative, the Campus and Community North would not be built, although Phase 1.1 Campus would continue to operate at its current location. Therefore, development under this alternative would be similar to the Proposed Action in terms of location but would be smaller in terms of population. The types of wastewater conveyance and treatment impacts that would result under this alternative would be similar to those of the Proposed Action but the magnitude of the impacts would be smaller because a smaller population would be associated with this alternative from the development of Community South and less extensive improvements might be needed. This is considered a less than significant impact.

Solid Waste

Because the population under this alternative would be smaller than that under the Proposed Action, solid waste generation from the Campus and University Community would be less. As in the case of the Proposed Action, this is considered a less than significant impact.

Electricity and Natural Gas

Development under Alternative 5 would be similar to the Proposed Action in terms of its location with respect to existing utilities. Therefore, the environmental impacts of this alternative related to on-site and off-site improvements, including the extension of electric transmission lines and natural gas pipelines, would be less than significant.

4.14.6.6 Alternative 6 – No Build

Water Service

As no new development would occur under the No Build Alternative, there would be no changes to the water service provided to the project site. There would be no new impacts.

Wastewater

As no new development would occur under the No Build Alternative, there would be no changes to the wastewater service provided to the project site. There would be no new impacts.

Solid Waste

As no new development would occur under the No Build Alternative, there would be no changes to the solid waste service provided to the project site. There would be no new impacts.

Electricity and Natural Gas

As no new development would occur under the No Build Alternative, there would be no changes to the on- and off-site infrastructure, including electric transmission lines and natural gas pipelines, on the project site. There would be no new impacts.

4.14.7 SUMMARY COMPARISON OF ALTERNATIVES

Alternatives 1, 2, 3, and 4 are similar in terms of the total population and the level of development that would be added to the region by each alternative. Therefore, the utility impacts of these alternatives would be similar. The utilities and services system impacts would be of a lesser magnitude under Alternatives 5 and 6 as these would involve smaller populations and less or no new development. Utility impacts under all alternatives would be less than significant.

4.14.8 REFERENCES

City of Merced. 2005. *City of Merced 2005 Urban Water Management Plan.* Draft Final. Prepared by Brown and Caldwell. November.

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4.15 OTHER RESOURCE TOPICS

4.15.1 INTRODUCTION

This section describes all other resource topics not discussed in other sections of **Section 4.0, Affected Environment and Environmental Consequences,** including mineral resources and navigation, that would either not be affected by the development of the University of California (UC) campus and University Community or that the impacts of the UC campus and University Community would clearly be less than significant.

No public and agency comments related to mineral resources and navigation were received in response to the Notice of Preparation or the Notice of Intent issued for this EIS/EIR.

4.15.2 MINERAL RESOURCES

4.15.2.1 Alternative 1 – Proposed Action

The 2002 Long Range Development Plan (LRDP) EIR (UC Merced 2002) concluded that there were no mineral resource zones (MRZ) present within the campus site. The 2004 University Campus Plan (UCP) EIR (Merced County 2004) found that the University Community site also does not contain any MRZ that require managed production (MRZ-2 area). Patches of undetermined sand and gravel resources categorized as MRZ-3a and MRZ-3b are located primarily in the northern and central-southern portion of the University Community site. Land areas classified MRZ-3a are underlain by geologic settings that are favorable environments for the occurrence of sand and gravel. Land areas classified MRZ-3b are underlain by geologic settings that appear to be favorable environments for sand and gravel (Merced County 2004).

No delineated mineral recovery sites are located on the campus site (UC Merced 2002). There are also no locally important mineral resource recovery sites delineated on any plans applicable to the University Community site. Implementation of the Proposed Action would not result in loss of availability of known mineral resources that would be of value to the region or residents of the state. Therefore, implementation of the Proposed Action would have no impact on mineral resources.

4.15.2.2 Alternative 2 – Yosemite Avenue

The area to the south of Yosemite Avenue that would be developed under this alternative has similar mineral resource conditions as Community South under the Proposed Action. For these reasons, the

impacts under this alternative would be identical to those under Alternative 1, Proposed Action, and this alternative would have no impact on mineral resources.

4.15.2.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch area has similar mineral resource conditions as the Proposed Action (City of Merced General Plan 1997). For these reasons, as in Alternative 1, Proposed Action, this alternative would have no impact on mineral resources.

4.15.2.4 Alternative 4 – 2002 Proposed Action

Impacts under this alternative would be similar to those under Alternative 1, Proposed Action. The proposed "Campus Land Reserve" and the "Campus Natural Reserve" under Alternative 5 would both remain undeveloped. Accordingly, this alternative would not result in any impacts to mineral resources in these reserve areas. The remaining Campus and University Community areas under this alternative are generally similar in location to that of Alternative 1, Proposed Action. As discussed above, the UCP EIR (Merced County 2004) found that the University Community site does not contain any MRZ that require managed production (MRZ-2 area). Patches of undetermined sand and gravel resources categorized as MRZ-3a and MRZ-3b are located primarily in the northern and central-southern portion of the University Community site. (Merced County 2004). Additionally, the 2002 LRDP EIR (UC Merced 2002) concluded that there are no mineral resource zones (MRZ) present within the Campus site. For these reasons, this alternative would have no impact on mineral resources (City of Merced General Plan 1997).

4.15.2.5 Alternative 5 – No Action

Under this alternative, while the existing Phase 1 Campus development would remain in place, no construction would occur on the remainder of the Campus and within Community North. Community South could develop based on development plans not related to the establishment of a UC campus in Merced. As discussed above under Alternative 1, Proposed Action, there are no locally important mineral resource recovery sites delineated on any plans applicable to Community South. Implementation of this alternative would not result in loss of availability of known mineral resources that would be of value to the region or residents of the state. Therefore, this alternative would have no impact on mineral resources.

4.15.2.6 Alternative 6 – No Build

The No Build Alternative would not include any direct ground-disturbing activities that could result in impacts to mineral resources. Therefore, there would be no effect related to these resources from implementation of this alternative.

4.15.3 NAVIGATION

4.15.3.1 Alternative 1 – Proposed Action

Navigation involves transport of people or freight by water. Currently no water body at or near the project site is used or has been used for commercial navigation. The project site is situated southeast of Lake Yosemite, which is a regulating reservoir owned and operated by the Merced Irrigation District (MID). Two approximately 50-foot-wide irrigation canals also owned by MID, the Le Grand Canal and the Fairfield Canal, convey water from the lake to agricultural areas to the south. Although these irrigation canals cross the Campus and the University Community, they are not used for navigation. Lake Yosemite is used for recreational activities, such as boating.

The nearest water body used for commercial navigation is the San Joaquin River in the vicinity of the Port of Stockton, approximately 100 miles north of the project site. Consequently, the Proposed Action would not alter the characteristics of any water body and would have no effect on navigation.

4.15.3.2 Alternative 2 – Yosemite Avenue

The area to the south of Yosemite Avenue that would be developed under this alternative has similar conditions as Community South under the Proposed Action. The irrigation canals that cross the Campus and University Community sites are not used for navigation. No water body at or near this alternative is used or has been used for commercial navigation. For these reasons, similar to Alternative 1, Proposed Action, this alternative would have no impact related to navigation.

4.15.3.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch area has similar conditions as the Proposed Action relative to navigation. Fahrens Creek bisects the Bellevue Ranch area from north to south. This creek is not used for navigation. For these reasons, similar to Alternative 1, Proposed Action, this alternative would have no impact related to navigation.

4.15.3.4 Alternative 4 – 2002 Proposed Action

Impacts under this alternative would be similar to those under Alternative 1, Proposed Action. The proposed Campus Land Reserve and the Campus Natural Reserve under Alternative 5 would both remain undeveloped. The remaining area under this alternative is generally similar in location to that of Alternative 1, Proposed Action. Currently no water body at or near this alternative is used or has been used for commercial navigation. The Le Grand Canal and the Fairfield Canal irrigation canals cross the Campus and University Community sites under this alternative and are not used for navigation. For these reasons, this alternative would have no impact related to navigation.

4.15.3.5 Alternative 5 – No Action

Under this alternative, although the existing Phase 1 Campus development would remain in place, the rest of the Campus and all of Community North would not be built. However, Community South could be developed based on plans not related to the establishment of a UC campus in Merced. As discussed above under Alternative 1, Proposed Action, no water body at or near the Community South site is used or has been used for commercial navigation. For this reason, similar to Alternative 1, Proposed Action, this alternative would have no impact related to navigation.

4.15.3.6 Alternative 6 – No Build

The No Build Alternative would have no impact related to navigation, as no navigable waters exist on site. Furthermore, no change to the physical environment would occur under this alternative. Therefore, there would be no effect related to this resource from the implementation of this alternative.

4.15.4 WILD AND SCENIC RIVERS

4.15.4.1 Alternative 1 – Proposed Action

Lake Yosemite Regional Park, including the 486-acre lake and surrounding shoreline, is located in close proximity to the Proposed Action. However, none of the waterways within or near the project site have wild and scenic status designation, nor do any refuges exist within or adjacent to the project area. Therefore, implementation of the Proposed Action would have no impact on wild and scenic rivers.

4.15.4.2 Alternative 2 – Yosemite Avenue

The area to the south of Yosemite Avenue that would be developed under this alternative does not contain any waterways with a wild and scenic status designation. Therefore, impacts under this

alternative would be identical to those under Alternative 1, Proposed Action, and this alternative would have no impact on wild and scenic rivers.

4.15.4.3 Alternative 3 – Bellevue Ranch

The Bellevue Ranch area does not contain any waterways with a wild and scenic status designation. Therefore, as in Alternative 1, Proposed Action, this alternative would have no impact on wild and scenic rivers.

4.15.4.4 Alternative 4 – 2002 Proposed Action

Impacts under this alternative would be the same as under Alternative 1, Proposed Action. Therefore, as in Alternative 1, Proposed Action, this alternative would have no impact on wild and scenic rivers.

4.15.4.5 Alternative 5 – No Action

Under this alternative, there are no waterways with a wild and scenic status designation. Therefore, implementation of this alternative would have no impact on wild and scenic rivers.

4.15.4.6 Alternative 6 – No Build

The No Build Alternative would not include any activities that could result in impacts to wild and scenic rivers. Therefore, there would be no effect related to these resources from implementation of this alternative.

4.15.5 REFERENCES

City of Merced. 1997. *Merced Vision 2015 General Plan.*

Merced County. 2004. *University Community Plan, Final Environmental Impact Report.*

URS. 2002. *Long Range Development Plan, Final Environmental Impact Report*. Prepared for UC Merced.

National Wild and Scenic Rivers System. http://www.rivers.gov/. Accessed October 2008.

4.16 GLOBAL CLIMATE CHANGE

4.16.1 INTRODUCTION

This section discusses the existing global, national, and statewide conditions for greenhouse gases (GHG) and global climate change and evaluates the potential impacts on global climate from the implementation of the Proposed Action and its alternatives. The section also provides a discussion of the applicable federal, state, regional, and local agencies that regulate, monitor, and control GHG emissions. Copies of the modeling runs to estimate GHG emissions associated with the Proposed Action and supporting technical data are found in **Appendix 4.3** of this Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR).

The following sources were used to prepare this section of the Draft EIS/EIR:

- UC Merced 2002 Long Range Development Plan (UC Merced 2002)
- County of Merced University Community Plan Final Environmental Impact Report (EIP Associates 2004)
- California Air Pollution Control Officers Association's California Environmental Quality Act (CEQA) & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the CEQA
- California Climate Action Registry's General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions

No specific public or agency comments related to this environmental topic were received in response to the Notice of Intent or the Notice of Preparation issued for this Draft EIS/EIR.

4.16.2 AFFECTED ENVIRONMENT

4.16.2.1 Description of the Greenhouse Effect

Heat retention within the atmosphere is an essential process to sustain life on Earth. The natural process through which heat is retained in the troposphere[1] is called the "greenhouse effect." The greenhouse effect traps heat in the troposphere through a three-fold process as follows: Short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit this long-wave radiation into space and toward the Earth. This "trapping" of the long-wave (thermal) radiation emitted

1 The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers).

back toward the Earth is the underlying process of the greenhouse effect. Without the greenhouse effect, the Earth's average temperature would be approximately -18 degrees Celsius (°C) (0° Fahrenheit [°F]) instead of its present 14 °C (57 °F) (National Climatic Data Center 2008). The most abundant GHGs are water vapor and carbon dioxide. Many other trace gases have greater ability to absorb and re-radiate long-wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long-wave radiation. The GWP of a gas is determined using carbon dioxide as the reference gas with a GWP of 1.

4.16.2.2 Greenhouse Gases

Primary Greenhouse Gases

Greenhouse gases include, but are not limited to, the following:[2]

- Carbon dioxide (CO_2). Carbon dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 250 years, the concentration of carbon dioxide in the atmosphere has increased 35 percent (US Environmental Protection Agency [US EPA] 2008b). Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs. In 2004, 83.8 percent of California's GHG emissions were carbon dioxide (California Energy Commission [CEC] 2006a).

- Methane (CH_4). Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane come from landfills, natural gas systems, and enteric fermentation (US EPA 2006b). Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.

- Nitrous oxide (N_2O). Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of nitrous oxide is 310.

- Hydrofluorocarbons (HFCs). HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing as the continued phase-out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 6,300 for HFC-236fa.

- Perfluorocarbons (PFCs). Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. Perfluorocarbons are potent GHGs with a GWP several thousand times that of carbon dioxide, depending on the specific PFC. Another area of concern regarding PFCs is their long atmospheric

2 All GWPs are given as 100-year GWP. Unless noted otherwise, all GWPs were obtained from IPCC 1996.

lifetime (up to 50,000 years) (Energy Information Administration n.d.). The GWPs of PFCs range from 5,700 to 11,900.

- Sulfur hexafluoride. Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change (IPCC) with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [ppt] in 1990 versus 365 parts per million [ppm]) (US EPA n.d.).

- Water vapor (H_2O). Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Water vapor and clouds contribute 66 to 85 percent of the greenhouse effect (water vapor alone contributes 36 to 66 percent) (Schmidt 2005). Natural processes such as evaporation from oceans and rivers and transpiration from plants contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively (US Geological Survey 2007). The primary human-related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a substantial amount (less than 1 percent) to atmospheric concentrations of water vapor (Energy Information Administration 2008). Therefore, the control and reduction of water vapor emissions is not within reach of human actions. The IPCC has not determined a GWP for water vapor.

Other Greenhouse Gases

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone depletors; therefore, their gradual phaseout is currently in effect. A few of these compounds are discussed below:

- Hydrochlorofluorocarbons (HCFCs). HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the protocol are subject to a consumption cap and gradual phase-out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b (US EPA 1996).

- 1,1,1-trichloroethane. 1,1,1-trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. In 1992, the US EPA issued Final Rule 57 FR 33754 scheduling the phaseout of methyl chloroform by 2002 (US EPA 2007). Therefore, the threat posed by methyl chloroform as a GHG will diminish. Nevertheless, the GWP of methyl chloroform is 110 times that of carbon dioxide (US EPA 1996).

- Chlorofluorocarbons (CFCs). CFCs are used as refrigerants, cleaning solvents, and aerosol spray propellants. CFCs were also part of the US EPA's Final Rule 57 FR 3374 for the phaseout of ozone depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere, contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,600 for CFC-11 to 14,000 for CFC-13 (US EPA 2006a).

- Ozone. Ozone occurs naturally in the stratosphere where it is largely responsible for filtering harmful ultraviolet (UV) radiation. In the troposphere, ozone acts as a GHG by absorbing and re-radiating the infrared energy emitted by the Earth. As a result of the industrial revolution and rising emissions of oxides of nitrogen (NO_X) and volatile organic compounds (VOCs) (ozone precursors), the concentrations of ozone in the troposphere have increased (IPCC 2008). Due to the short life span of ozone in the troposphere, its concentration and contribution as a GHG is not well established. However, the greenhouse effect of tropospheric ozone is considered small, as the radiative forcing[3] of ozone is 25 percent of that of carbon dioxide (IPCC 2007).

4.16.2.3 Contributions to Greenhouse Gas Emissions

Global

Anthropogenic GHG emissions worldwide as of 2005 (the latest year for which data are available for Annex 1 countries) totaled approximately 30,800 CO_2 equivalent million metric tons ($MMTCO_2E$).[4] It should be noted that global emissions inventory data are not all from the same year and may vary depending on the source of the emissions inventory data (UNFCCC n.d.[a] and UNFCCC n.d.[b]).[5] Six countries and the European Community accounted for approximately 70 percent of the total global emissions (See **Table 4.16-1, Six Top GHG Producer Countries and the European Community**). The GHG emissions in more recent years may be substantially different than those shown in **Table 4.16-1**.

United States

As noted in **Table 4.16-1**, the United States was the top producer of greenhouse gas emissions as of 2005. Based on GHG emissions in 2004, six of the states—Texas, California, Pennsylvania, Ohio, Illinois, and Florida, in ranked order—would each rank among the top 30 GHG emitters internationally (World Resources Institute 2006). The primary greenhouse gas emitted by human activities in the United States was CO_2, representing approximately 84 percent of total greenhouse gas emissions (US EPA 2008b). Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 80 percent of US GHG emissions (US EPA 2008b).

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3 Radiative forcing, measured in Watts/m^2, is an externally imposed perturbation (e.g., stimulated by greenhouse gases) in the radiative energy budget of the Earth's climate system (i.e., energy and heat retained in the troposphere minus energy passed to the stratosphere).

4 The CO_2 equivalent emissions are commonly expressed as "million metric tons of carbon dioxide equivalent ($MMTCO_2E$)" The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP, such that $MMTCO_2E$ = (million metric tons of a GHG) x (GWP of the GHG). For example, the GWP for methane is 21. This means that emissions of one million metric tons of methane are equivalent to emissions of 21 million metric tons of CO_2.

5 The global emissions are the sum of Annex I and non-Annex I countries without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries that 2004 data were unavailable, the UNFCCC data for the most recent year were used.

Table 4.16-1
Six Top GHG Producer Countries and the European Community

Emitting Countries	GHG Emissions ($MMTCO_2E$)*
United States	7,241.5[1]
China	4,882.7[2]
European Community	4,192.6[1]
Russian Federation	2,132.5[1]
India	1,606.5[2]
Japan	1,359.9[1]
Germany[3]	1,001.5[1]
Total	**21,415.7**

Sources:
1 UNFCC n.d.(a)
2 GHG emissions for China and India (Calendar Year 2000) were obtained from the World Resources Institute's Climate Analysis Indicators Tool (CAIT) http://www.cait.wri.org/cait.php
3 Germany's GHG emissions are included in the European Community.
** Excludes emissions/removals from land use, land-use change and forestry (LULUCF)*

State of California

Based upon the 2004 GHG inventory data (the latest year available) compiled by the California Air Resources Board (CARB) for the California 1990 greenhouse gas emissions inventory, California emitted emissions of 484 $MMTCO_2E$, including emissions resulting from out-of-state electrical generation (CARB 2007). Based on the CARB inventory and GHG inventories for countries contributing to the worldwide GHG emissions inventory compiled by the United Nations Framework Convention on Climate Change (UNFCCC) for 2005, California's GHG emissions rank second in the United States (Texas is number one) with emissions of 423 $MMTCO_2E$ (excluding emissions related to imported power) and internationally between Ukraine (418.9 $MMTCO_2E$) and Spain (440.6 $MMTCO_2E$) (UNFCCC n.d.[a]).

A California Energy Commission (CEC) emissions inventory report placed CO_2 produced by fossil fuel combustion in California as the largest source of GHG emissions in 2004, accounting for 81 percent of the total GHG emissions (CEC 2006a). CO_2 emissions from other sources contributed 2.8 percent of the total GHG emissions, methane emissions 5.7 percent, nitrous oxide emissions 6.8 percent, and the remaining 2.9 percent was composed of emissions of high-GWP gases (CEC 2006a). These high-GWP gases are largely composed of refrigerants and a small contribution of sulfur hexafluoride (SF_6) used as insulating materials in electricity transmission and distribution.

The primary contributors to GHG emissions in California are transportation, electric power production from both in state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions are presented in **Table 4.16-2, GHG Sources in California**.

Table 4.16-2
GHG Sources in California[1]

Source Category	Annual GHG Emissions ($MMTCO_2E$)[a]	Percent of Total	Annual GHG Emissions ($MMTCO_2E$)[b]	Percent of Total
Agriculture	27.9	5.8%	27.9	6.6%
Commercial Uses	12.8	2.6%	12.8	3.0%
Electricity Generation	119.8	24.7%	58.5	13.8%
Forestry (excluding sinks)	0.2	0.0%	0.2	0.0%
Industrial Uses	96.2	19.9%	96.2	22.7%
Residential Uses	29.1	6.0%	29.1	6.9%
Transportation	182.4	37.7%	182.4	43.1%
Other[c]	16.0	3.3%	16.0	3.8%
Totals	484.4	100.0%	423.1	100.0%

Sources:
[1] *CARB 2007.*
[a] *Includes emissions associated with imported electricity, which account for 61.3 $MMTCO_2E$ annually.*
[b] *Excludes emissions associated with imported electricity.*
[c] *Unspecified combustion and use of ozone-depleting substances.*

It should be noted that emissions from each of these economic sectors are not confined to emissions from a single process, since there is crossover with other sectors. For example, the GHG emissions from cement production places clinker manufacturing in its own category and the fuel used to heat the cement production process within the industrial fuel category. In the case of landfills, methane emissions and CO_2 emissions and sinks are reported in their respective portions of the inventory. Taken together, the CO_2 sinks approximately offset the landfill methane emissions. Additionally, fuel-related GHG emissions from transporting wastes to landfills are included in transportation fuels.

4.16.2.4 Global Climate Change

Climate change refers to any substantial change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer) (US EPA 2008a). Climate change may result from

- natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g., changes in ocean circulation, reduction in sunlight from the addition of GHG and other gases to the atmosphere from volcanic eruptions); and
- human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification).

Indications of Anthropogenic Influences

The impact of anthropogenic activities on global climate change is readily apparent in the observational record. For example, surface temperature data shows that 11 of the 12 years from 1995 to 2006 rank among the 12 warmest since 1850, the beginning of the instrumental record for global surface temperature (IPCC 2007). In addition, the atmospheric water vapor content has increased since at least the 1980s over land, sea, and in the upper atmosphere, consistent with the capacity of warmer air to hold more water vapor; ocean temperatures are warmer to depths of 3,000 feet; and a marked decline has occurred in mountain glaciers and snowpack in both hemispheres, and in polar ice and ice sheets in both the arctic and Antarctic regions (IPCC 2007).

Influence of Industrialization

Air trapped by ice has been extracted from core samples taken from polar ice sheets to determine the global atmospheric variation of carbon dioxide, methane, and nitrous oxide from before the start of the industrialization, around 1750, to over 650,000 years ago. For that period, it was found that carbon dioxide concentrations ranged from 180 ppm to 300 ppm. For the period from around 1750 to the present, global carbon dioxide concentrations increased from a pre-industrialization period concentration of 280 ppm to 379 ppm in 2005, with the 2005 value far exceeding the upper end of the pre-industrial period range (IPCC 2007). Global methane and nitrous oxide concentrations show similar increases for the same period (see **Table 4.16-3, Comparison of Global Pre-Industrial and Current GHG Concentrations**).

Table 4.16-3
Comparison of Global Pre-Industrial and Current GHG Concentrations[1]

Greenhouse Gas	Early Industrial Period Concentrations (ppm)	Natural Range for Last 650,000 Years (ppm)	2005 Concentrations (ppm)
Carbon Monoxide	280	180 to 300	379
Methane	715	320 to 790	1774
Nitrous Oxide	270	NA	319

Sources:
[1] *Intergovernmental Panel on Climate Change, "Climate Change 2007"*

Secondary Effects of Global Climate Change

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2° Celsius per decade, determined from meteorological measurements worldwide between 1990 and 2005 (IPCC 2007). Climate change modeling using 2000 emission rates shows that further warming would occur, which would induce further changes in the global climate system during the current century (IPCC 2007). Changes to the global climate system and ecosystems and to California would include, but would not be limited to

- The loss of sea ice and mountain snowpack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures; (IPCC 2007)
- A rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps, the Greenland and Antarctic ice sheets (IPCC 2007)
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones; (IPCC 2007)
- The decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years; (California EPA [Cal/EPA] Climate Action Team 2006)
- An increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century (California EPA Climate Action Team 2006); and

- High potential for erosion of California's coastlines and sea water intrusion into the Delta and associated levee systems due to the rise in sea level (California EPA Climate Action Team 2006).

Secondary Effects of Global Climate Change on Groundwater Supply

Global changes in temperature and precipitation patterns, including changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns, and aspects of extreme weather including droughts, heavy precipitation, and heat waves all have the potential to significantly affect the nation's water resources and water demands. It is projected that climate change will cause more precipitation in the form of rain rather than snow, resulting in less water storage in the annual snowpack and earlier snowmelt. The hydrology in California is controlled by the timing and intensity of the spring snowmelt, and is facilitated primarily by the degree of warming during this time period. It is expected that surface water yields in California will increase in late winter/early spring because of increased runoff due to the seasonality of the precipitation changes and to an earlier spring snowmelt caused by the projected warming under climate change. Conversely, decreases in surface water are expected through summer and fall (DWR 2006).

The vast majority of California's groundwater that is accessible in significant amounts is stored in alluvial groundwater basins, which cover nearly 40 percent of the geographic area of the state (DWR 2003). Groundwater supplies contribute water used for beneficial purposes and has historically been depended upon during droughts. In many areas of California, current levels of groundwater use are already unsustainable, with pumping rates exceeding natural recharge (DWR 2005). During drier years, groundwater pumping is often relied upon to balance the increased demands caused by heat and drought (DWR 2006). It is anticipated that groundwater would be used in this capacity to increase water supply reliability through period of climate fluctuations associated with global climate change.

The global climate change would directly impact groundwater supplies through changes in recharge of surface water resulting from changes in effective rainfall as well as a change in the timing of the recharge season. In general, a large portion of recharge during the winter comes from deep percolation of precipitation below the rooting zone, whether of native vegetation or farmland. The increased winter rainfall and higher temperatures could increase the groundwater recharge during the period of infiltration where soils freeze. Higher evaporation or shorter rainfall seasons, on the other hand, could mean that the moisture deficits in the soil persist for longer periods of time, shortening recharge seasons. Therefore, a greater amount of rain in subsequent storms would then be required to wet the root zone and provide water for deep percolation (DWR 2005). The generally warmer and wetter winters would increase the amount of runoff available for groundwater recharge. However, this additional runoff in the winter would be occurring at a time when some basins are either being recharged at their maximum

capacity or are already full. Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge (DWR 2005).

4.16.3 APPLICABLE LAWS, REGULATIONS, PLANS, AND POLICIES

4.16.3.1 International Activities

Kyoto Protocol

The original Kyoto Protocol was negotiated in December 1997 and came into force on February 16, 2005. As of May 2008, 181 countries and the European Economic Community have ratified the agreement (UNFCCC n.d.[c]). Notably, however, the US has not ratified the protocol. Participating nations are separated into Annex 1 (i.e., industrialized countries) and Non-Annex 1 (i.e., developing countries) countries that have differing requirements for GHG reductions. The goal of the protocol is to achieve overall emissions reduction targets for six GHGs by the period 2008 to 2012. The six GHGs regulated under the protocol are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, HFCs, and PFCs. Each nation has an emissions reduction target under which they must reduce GHG emissions a certain percentage below 1990 levels (e.g., 8 percent reduction for the European Union, 6 percent reduction for Japan). The average reduction target for nations participating in the Kyoto Protocol is approximately five percent below 1990 levels (Pew Center on Global Climate Change n.d.). Although the United States has not ratified the protocol, it has established a target of 18 percent reduction in GHG emissions intensity by 2012 (White House n.d.). Greenhouse gas intensity is the ratio of GHG emissions to economic output (i.e., gross domestic product).

Intergovernmental Panel on Climate Change

The World Meteorological Organization (WMO) and United Nations Environmental Program (UNEP) established the IPCC in 1988. The goal of the IPCC is to evaluate the risk of climate change caused by human activities. Rather than performing research or monitoring climate, the IPCC relies on peer-reviewed and published scientific literature to make its assessment. The IPCC assesses information (i.e., scientific literature) regarding human-induced climate change, impacts of human-induced climate change, and options for adaptation and mitigation of climate change. The IPCC reports its evaluation through special reports called "assessment reports." The latest assessment report (i.e., Fourth Assessment Report, consisting of three working group reports and a synthesis report based on the first three reports) was published in 2007.[6]

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6 The IPCC's Fourth Assessment Report is available online at http://www.ipcc.ch/.

4.16.3.2 Federal Activities

In *Massachusetts vs. EPA,* the Supreme Court held that US EPA has the statutory authority under Section 202 of the federal Clean Air Act (CAA) to regulate GHGs from new motor vehicles. The court did not hold that the US EPA was required to regulate GHG emissions; however, it indicated that the agency must decide whether GHGs from motor vehicles cause or contribute to air pollution that is reasonably anticipated to endanger public health or welfare. Upon the final decision, President Bush signed Executive Order 13432 on May 14, 2007, directing the US EPA, along with the Departments of Transportation, Energy, and Agriculture, to initiate a regulatory process that responds to the Supreme Court's decision. The order requires the US EPA to coordinate closely with other federal agencies and to consider the president's Twenty-in-Ten plan in this process. The Twenty-in-Ten plan would establish a new alternative fuel standard that would require the use of 35 billion gallons of alternative and renewable fuels by 2017. The US EPA will be working closely with the Department of Transportation in developing new automotive efficiency standards.

4.16.3.3 California Activities

California has enacted several legislative bills and executive orders aimed at reducing the state's greenhouse gas inventory and its impact on global climate change. These are discussed in chronological order below.

Assembly Bill 1493

In a response to the transportation sector accounting for more than half of California's CO_2 emissions, Assembly Bill 1493 (AB 1493, Pavley) was enacted on July 22, 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set the GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. In setting these standards, CARB must consider cost-effectiveness, technological feasibility, economic impacts, and provide maximum flexibility to manufacturers. CARB adopted the standards in September 2004. These standards are intended to reduce emissions of carbon dioxide and other greenhouse gases (e.g., nitrous oxide, methane). The new standards would phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in a reduction of about 22 percent in greenhouse gas emissions compared to the emissions from the 2002 fleet, while the mid-term (2013-2016) standards will result in a reduction of about 30 percent. Some currently used technologies that achieve GHG reductions include small engines with superchargers, continuously variable transmissions, and hybrid electric drive.

In December 2004, these regulations were challenged in federal court by the Alliance of Automobile Manufacturers, who claimed that the law regulated vehicle fuel economy, a duty assigned to the federal government. The case had been put on hold by a federal judge in Fresno pending the US Supreme Court's decision in *Massachusetts vs. EPA*. The US Supreme Court's ruling in favor of the state of Massachusetts has been discussed as a likely vindication of state efforts to control GHG emissions. In December 2007, Judge Ishii of the US District Court for the Eastern District dismissed the case by the Alliance of Automobile Manufacturers. However, before these regulations may go into effect, the US EPA must grant California a waiver under the federal CAA, which ordinarily preempts state regulation of motor vehicle emission standards. Following the issuance of the *Massachusetts vs. EPA* decision, the US EPA announced that it would decide whether to grant California a waiver by December 2007. On December 19, 2007, Stephen Johnson, the US EPA Administrator, denied the waiver citing the need for a national approach to reducing greenhouse gas emissions, the lack of a "need to meet compelling and extraordinary conditions," and the benefits to be achieved through the Energy Independence and Security Act of 2007 (Johnson 2007). The California Attorney General subsequently filed suit in January 2008 to overturn the administrator's decision.

Executive Order S-3-05

In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The secretary of Cal/EPA is required to coordinate efforts of various agencies in order to collectively and efficiently reduce GHGs. Some of the agency representatives involved in the GHG reduction plan include the secretary of the Business, Transportation and Housing Agency; the secretary of the Department of Food and Agriculture, the secretary of the Resources Agency, the Chairperson of CARB; the chairperson of the CEC; and the president of the Public Utilities Commission. Representatives from each of the aforementioned agencies comprise the Climate Action Team. The Climate Action Team is responsible for implementing global warming emissions reduction programs. In order to achieve these goals, the Climate Action Team is organized into two subgroups: the market-based options subgroup and the scenario analysis subgroup. The Cal/EPA secretary is required to submit a biannual progress report from the Climate Action Team to the governor and state legislature disclosing the progress made toward GHG emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and reporting possible mitigation and adaptation plans to combat these impacts. The Climate Action Team has fulfilled both of these report requirements through its March 2006 Climate Action Team Report to Governor

Schwarzenegger and the legislature (California EPA Climate Action Team 2006). Some strategies currently being implemented by state agencies include CARB introducing vehicle climate change standards and diesel anti-idling measures, the Energy Commission implementing building and appliance efficiency standards, and the Cal/EPA implementing their green building initiative. The Climate Action Team also recommends future emission reduction strategies, such as using only low-GWP refrigerants in new vehicles, developing ethanol as an alternative fuel, reforestation, solar power initiatives for homes and businesses, and investor-owned utility energy efficiency programs. According to the report, implementation of current and future emission reduction strategies have the potential to achieve the goals set forth in Executive Order S-3-05.

Assembly Bill 32

In furtherance of the goals established in Executive Order S-3-05, the Legislature enacted Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major industries with penalties for noncompliance.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. The first GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted. In order to advise CARB, it must convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee. By January 2008, the first deadline for AB 32, a statewide cap for 2020 emissions based on 1990 levels and mandatory reporting rules for significant sources of GHGs must be adopted. The following year (January 2009), CARB must adopt a scoping plan indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions.

The first action under AB 32 resulted in the adoption of a report listing early action greenhouse gas emission reduction measures on June 21, 2007. The early actions include three specific GHG control rules. On October 25, 2007, CARB approved an additional six early action GHG reduction measures under AB 32. These early action GHG reduction measures are to be adopted and enforced before January 1,

2010, along with 32 other climate-protecting measures CARB is developing between now and 2011. The report divides early actions into three categories:

- Group 1 - GHG rules for immediate adoption and implementation
- Group 2 - Several additional GHG measures under development
- Group 3 - Air pollution controls with potential climate co-benefits

The original three adopted early action regulations meeting the narrow legal definition of "discrete early action GHG reduction measures" include:

- A low-carbon fuel standard to reduce the "carbon intensity" of California fuels;
- Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants; and
- Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies.

The additional six early action regulations adopted on October 25, 2007, also meeting the narrow legal definition of "discrete early action GHG reduction measures," include:

- Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology;
- Reduction of auxiliary engine emissions of docked ships by requiring port electrification;
- Reduction of perfluorocarbons from the semiconductor industry;
- Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products);
- Require that all tune-up, smog check and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency; and
- Restriction on the use of sulfur hexafluoride (SF6) from non-electricity sectors if viable alternatives are available.

As required under AB 32, on December 6, 2007, CARB approved the 1990 greenhouse gas emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO_2E. The inventory revealed that in 1990 transportation, with 35 percent of the state's total emissions, was the largest single sector, followed by industrial emissions, 24 percent; imported electricity, 14 percent; in-state electricity generation, 11 percent; residential use, 7 percent; agriculture, 5 percent; and commercial uses, 3 percent.

In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of greenhouse gases for large facilities on December 6, 2007. The mandatory reporting regulations require annual reporting from the largest facilities in the state, which account for 94 percent of greenhouse gas emissions from industrial and commercial stationary sources in California. About 800 separate sources that fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and industrial sources that emit over 25,000 tons of carbon dioxide each year from on-site stationary combustion sources. Transportation sources, which account for 38 percent of California's total greenhouse gas emissions, are not covered by these regulations but will continue to be tracked through existing means. Affected facilities will begin tracking their emissions in 2008, to be reported beginning in 2009 with a phase-in process to allow facilities to develop reporting systems and train personnel in data collection. Emissions for 2008 may be based on best available emission data. Beginning in 2010, however, emissions reports will be more rigorous and will be subject to third-party verification. Verification will take place annually or every three years, depending on the type of facility.

As indicated above, AB 32 requires CARB to adopt a scoping plan by January 2009 indicating how reductions in significant GHG sources will be achieved through regulations, market mechanisms, and other actions. After receiving public input on their discussion draft of the Proposed Scoping Plan released in June 2008, CARB released the Climate Change Proposed Scoping Plan in October 2008 that contains an outline of the proposed State strategies to achieve the 2020 greenhouse gas emission limits. Key elements of the Proposed Scoping Plan include the following recommendations:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewables energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation

Under the Proposed Scoping Plan, approximately 85 percent of the state's emissions are subject to a cap-and-trade program where covered sectors are placed under a declining emissions cap. The emissions cap incorporates a margin of safety whereas the 2020 emissions limit will still be achieved even in the event that uncapped sectors do not fully meet their anticipated emission reductions. Emissions reductions will be achieved through regulatory requirements and the option to reduce emissions further or purchase allowances to cover compliance obligations. It is expected that emission reduction from this cap-and-trade program will account for a large portion of the reductions required by AB 32. The Proposed Scoping Plan will be considered for approval at a two-day meeting of the CARB Governing Board on December 11–12, 2008.

Table 4.16-4, AB 32 Proposed Scoping Plan Measures, lists CARB's proposed recommendations for achieving greenhouse gas reductions under AB 32 along with a brief description of the requirements and applicability.

Table 4.16-4
AB 32 Proposed Scoping Plan Measures

Scoping Plan Measure	Description
SPM-1: California Cap-and-Trade Program linked to Western Climate Initiative	Implement a broad-based cap-and-trade program that links with other Western Climate Initiative Partner programs to create a regional market system. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms. Capped sectors include transportation, electricity, natural gas, and industry. Projected 2020 business-as-usual emissions are estimated at 512 MTCO2E; preliminary 202 emissions limit under cap-and-trade program are estimated at 365 MTCO2E (29 percent reduction).
SPM-2: California Light-Duty Vehicle GHG Standards	Implement adopted Pavley standards and planned second phase of the program. AB 32 states that if the Pavley standards (AB 1493) do not remain in effect, CARB shall implement equivalent or greater alternative regulations to control mobile sources.
SPM-3: Energy Efficiency	Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts. The Proposed Scoping Plan considers green building standards as a framework to achieve reductions in other sectors, such as electricity.
SPM-4: Renewables Portfolio Standard	Achieve 33 percent Renewables Portfolio Standard by both investor-owned and publicly owned utilities.
SPM-5: Low Carbon Fuel Standard	Develop and adopt the Low Carbon Fuel Standard (LCFS). CARB identified the LCFS as a Discrete Early Action item and is developing a regulation for Board consideration in late 2008. In January 2007, Governor Schwarzenegger issued Executive Order S-1-07, which called the reduction of the carbon intensity of California's transportation fuels by at least ten percent by 2020.

Scoping Plan Measure	Description
SPM-6: Regional Transportation-Related Greenhouse Gas Targets	Develop regional greenhouse gas emissions reduction targets for passenger vehicles. SB 375 requires CARB to develop, in consultation with metropolitan planning organizations (MPOs), passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035 by September 30, 2010. SB 375 requires MPOs to prepare a sustainable communities strategy to reach the regional target provided by CARB.
SPM-7: Vehicle Efficiency Measures	Implement light-duty vehicle efficiency measures. CARB is pursuing fuel-efficient tire standards and measures to ensure properly inflated tires during vehicle servicing.
SPM-8: Goods Movement	Implement adopted regulations for port drayage trucks and the use of shore power for ships at berth. Improve efficiency in goods movement operations.
SPM-9: Million Solar Roofs Program	Install 3,000 MW of solar-electric capacity under California's existing solar programs.
SPM-10: Heavy/Medium-Duty Vehicles	Adopt heavy- and medium-duty vehicle and engine measures. Measures targeting aerodynamic efficiency, vehicle hybridization, and engine efficiency are recommended.
SPM-11: Industrial Emissions	Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.
SPM-12: High Speed Rail	Support implementation of a high-speed rail (HSR) system. This measure supports implementation of plans to construct and operate a HSR system between Northern and Southern California serving major metropolitan centers.
SPM-13: Green Building Strategy	Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.
SPM-14: High GWP Gases	Adopt measures to reduce high global warming potential gases. The Proposed Scoping Plan contains 6 measures to reduce high GWP gases from mobile sources, consumer products, stationary sources, and semiconductor manufacturing.
SPM-15: Recycling and Waste	Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.
SPM-16: Sustainable Forests	Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation. The federal government and California's Board of Forestry and Fire Protection has the regulatory authority to implement the Forest Practice Act to provide for sustainable management practices. This measure is expected to play a greater role in the 2050 goals.
SPM-17: Water	Continue efficiency programs and use cleaner energy sources to move water. California will also establish a public goods charge for funding investments in water efficiency that will lead to as yet undetermined reductions in greenhouse gases.

Scoping Plan Measure	Description
SPM-18: Agriculture	In the near term, encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory by 2020. Increase efficiency and encourage use of agricultural biomass for sustainable energy production. CARB has begun research on nitrogen fertilizers and will explore opportunities for emission reductions.

Source: California Air Resources Board, Climate Change Proposed Scoping Plan, (2008).

Senate Bill 1368

Governor Schwarzenegger, just two days after signing AB 32, reiterated California's commitment to reducing GHGs by signing Senate Bill 1368 (SB 1368, Perata). SB 1368 requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the Public Utilities Commission. This effort will help to protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low or lower than new combined-cycle natural gas plants, by requiring imported electricity to meet GHG performance standards in California and requiring that the standards be developed and adopted in a public process.

Executive Order S-1-07

On January 18, 2007, California further solidified its dedication to reducing GHGs by setting a new Low Carbon Fuel Standard (LCFS) for transportation fuels sold within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in CO_2-equivalent gram per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The LCFS will apply to refiners, blenders, producers, and importers of transportation fuels and will use market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods. The Executive Order requires the secretary of Cal/EPA to coordinate with actions of the CEC, CARB, the University of California, and other agencies to develop a protocol to measure the "life-cycle carbon intensity" of transportation fuels. CARB is anticipated to complete its review of the LCFS protocols no later than June 2007 and implement the regulatory process for the new standard by December 2008.

Senate Bill 97

In August 2007, as part of the legislation accompanying the state budget negotiations, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of greenhouse gas emissions. OPR is to develop proposed guidelines by July 1, 2009, and the Resources Agency is directed to adopt guidelines by January 1, 2010. On June 19, 2008, OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents (OPR 2008). The advisory indicated that a project's GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities, should be identified and estimated. The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level. The advisory did not recommend a specific threshold of significance—either quantitative or qualitative—leaving this to the lead agency's judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable.

Senate Bill 375

The California Legislature passed SB 375 (Steinberg) on September 1, 2008. SB 375 would require CARB to set regional greenhouse gas reduction targets after consultation with local governments. The target must then be incorporated within that region's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy. SB 375 also requires each region's Regional Housing Needs Assessment (RHNA) to be adjusted based on the Sustainable Communities Strategy in its RTP. Additionally, SB 375 will reform the environmental review process to create incentives to implement the strategy, especially transit priority projects. The governor signed SB 375 into law on September 30, 2008.

4.16.3.4 Other Statewide and Regional Activities

SJVAPCD Climate Change Action Plan

In August 2008, the San Joaquin Valley Air Pollution Control District (SJVAPCD) Governing Board adopted the Climate Change Action Plan (CCAP) that encompasses three goals: (1) to assist local agencies address greenhouse gas emissions within the context of CEQA; (2) to assist San Joaquin Valley businesses in complying with the anticipated mandates of AB 32; and (3) to ensure that climate protection measures do not have an adverse effect on public health or environmental justice initiatives.

The CCAP contains five actions that SJVAPCD staff would undertake in order to achieve the three goals. The first action would require the SJVAPCD to develop guidelines for local land-use agencies in addressing GHG emissions through the CEQA process. The second action would establish a voluntary San Joaquin Valley Carbon Exchange Bank in which businesses could obtain carbon credits for early reductions in GHG emissions in advance of regulatory requirements. The credits could be used to provide CEQA mitigation for future growth, comply with AB 32 mandates, or sold as commodities to others requiring such carbon credits. The third action would allow the SJVAPCD to execute and administer voluntary GHG mitigation agreements with project proponents needing assistance from the district to quantify and mitigate GHG emissions associated with their projects. Under such an agreement, the district would administer grant programs and procure emission reductions while the project proponent would provide funding to the district at the rate necessary to secure the needed reduction in emissions, including administrative costs. The fourth action would integrate the SJVAPCD's criteria pollutant emissions inventory reporting program with the state's proposed mandatory GHG reporting system for major sources of GHG emissions. The SJVAPCD would work closely with CARB in order to avoid duplicative and onerous reporting requirements. The last action would require the SJVAPCD to oppose any GHG reduction measures that result in an increase toxic or criteria pollutant emissions in already impacted regions. While many GHG reduction measures provide a co-benefit of reducing toxic or criteria pollutant emissions, certain measures, such as incineration of GHGs, could cause an increase in these pollutants.

The SJVAPCD has not provided a detailed timeline regarding implementation of the actions described in the CCAP. Several of the actions would be driven by future state mandates to achieve the goals of AB 32. In addition, CARB is currently in the process of developing draft guidance for assessing global climate change impacts and GHG emissions in the CEQA process. It is not known to what extent the SJVAPCD's guidance would mirror the state's guidance. Nonetheless, the Proposed Action would comply with the relevant and applicable guidance and programs adopted by the SJVAPCD under the CCAP.

California Climate Action Registry

The California Climate Action Registry (CCAR) is a private non-profit organization formed by the State of California and serves as a voluntary GHG registry to protect and promote early actions to reduce GHG emissions by organizations. Senate Bill 1771 (SB 1771, Sher) formally established the CCAR with technical changes made to the statute in SB 527, which finalized the structure for the California Registry. The CCAR began with 23 Charter Members and currently has over 300 corporations, universities, cities and counties, government agencies and environment organizations voluntarily measuring, monitoring, and publicly reporting their GHG emissions using the CCAR protocols. The CCAR has published a General Reporting Protocol, as well as project- and industry-specific protocols for landfill activities, livestock

activities, the cement sector, the power/utility sector, and the forest sector. The protocols provide the principles, approach, methodology, and procedures required for participation in the CCAR.

CAPCOA CEQA and Climate Change White Paper

The California Air Pollution Control Officers Association (CAPCOA) prepared a white paper on CEQA and climate change in January 2008. The white paper was intended to be used as a resource by lead agencies when considering policy options and not as a guidance document. Specifically, the white paper discusses three possible approaches to evaluating the significance of GHG emissions and possible mitigation measures; however, CAPCOA does not endorse any particular approach. The three alternative significance approaches are: (1) not establishing a significance threshold for GHG emissions; (2) setting the GHG emission threshold at zero; and (3) setting the GHG emission threshold at some non-zero level. The white paper evaluates potential considerations and pitfalls associated with the three approaches. At the end of the white paper, CAPCOA provides a list of potential mitigation measures and discusses each in terms of emissions reduction effectiveness, cost effectiveness, and technical and logistical feasibility. While programs are still being developed by CARB, the white paper provides public agencies with information to ensure that GHG emissions are, according to CAPCOA, "appropriately considered and addressed under CEQA."

4.16.3.5 UC Policy on Sustainable Practices and Emission Reduction Strategies

In March 2007, as an update to the green building policy adopted in 2004, the President of the University of California issued a Presidential Policy on Sustainable Practices, which was accompanied by Policy Guidelines for Sustainable Practices. The policy documents the University's commitment to the stewardship of the environment and to reducing the University's dependence on non-renewable energy sources. Emission reduction strategies established under this policy include practices related to green building design, clean energy, climate protection, transportation, operations, recycling and waste management, and environmentally preferable procurement. Excerpts from the policy that are relevant to global climate change are listed below.

I. Green Building Design

New Buildings

- All new building projects, other than acute-care facilities, will outperform the required provisions of the California Energy Code (Title 24) energy-efficiency standards by at least 20 percent.
- The University of California will design and build all new buildings, except for laboratory and acute care facilities, to a minimum standard equivalent to a LEED™ 2.1 "Certified" rating.

- Campuses will strive to achieve a standard equivalent to a LEED™ "Silver" rating or higher, whenever possible within the constraints of program needs and standard budget parameters.

- The University of California will design and build all new laboratory buildings to a minimum standard equivalent to a LEED™ 2.1 "Certified" rating and the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC), as appropriate.

Building Renovations

- Any significant renovation projects involving existing buildings will also apply sustainability principles to the systems, components and portions of the building being renovated.

- Renovation of buildings that require 100 percent replacement of mechanical, electrical and plumbing systems and replacement of over 50 percent of all non-shell areas (interior walls, doors, floor coverings and ceiling systems) should at a minimum comply with a UC equivalent to a LEED-NC 2.1 or the most current version of the LEED NC program certified rating.

II. Clean Energy Standard

- The University will implement a system-wide portfolio approach to reduce consumption of nonrenewable energy. The portfolio will include a combination of energy efficiency projects, the incorporation of local renewable power measures for existing and new facilities, green power purchases from the electrical grid, and other energy measures with equivalent demonstrable effect on the environment and reduction in fossil fuel usage.

- The University will strive to achieve a level of grid-provided electricity purchases from renewable sources equaling 20 percent of its electricity needs from renewable sources by 2010.

- The University will develop a strategic plan for siting renewable power projects in existing and new facilities with a goal of providing up to 10 megawatts of local renewable power by 2014.

- The University will develop a strategic plan for implementing energy efficiency projects for existing buildings and infrastructure to include operational changes and the integration of best practices.

III. Climate Protection Practices

- The University will develop a long term strategy for voluntarily meeting the State of California's goal, pursuant to the "California Global Warming Solutions Act of 2006" that is by 2020, to reduce greenhouse gas emissions to 1990 levels.

- Each UC campus will pursue individual membership with the California Climate Action Registry.

IV. Sustainable Transportation Practices

Incorporate alternative means of transportation to/from and within the campus to improve the quality of life on campus and in the surrounding community. The campuses will continue their strong commitment

to provide affordable on-campus housing, in order to reduce the volume of commutes to and from the campus. These housing goals are detailed in the campuses' Long Range Development Plans.

V. Sustainable Operations

Track, report, and minimize greenhouse gas emissions on behalf of University operations.

4.16.3.6 UC Merced 2009 Long Range Development Plan

Creating and maintaining a campus that demonstrates sustainability is the central mandate of the 2009 Long Range Development Plan (LRDP). The 2009 LRDP establishes a significant sustainability goal for the campus: to have no energy, carbon, or waste footprint by 2020. The UC Merced 2009 LRDP includes an array of sustainability and other policies that are all designed to minimize air emissions. All of the pertinent policies are listed in subsequent tables in this section.

4.16.4 SIGNIFICANCE CRITERIA FOR EVALUATING EFFECTS

To date, no local or state air quality agency has adopted significance criteria for GHG emissions. While the Global Warming Solutions Act (AB 32) created a framework for the reduction of GHGs in California, the Act did not address the role of CEQA in achieving the goals of the Act. As noted earlier, in August 2007, the governor signed SB 97 (Dutton) into law, which requires the OPR to prepare *State CEQA Guidelines* for the mitigation of GHG emissions or the effects of greenhouse gas emissions. Although OPR has issued a technical advisory to assist lead agencies in addressing GCC in CEQA documents, the document is advisory in nature. The guidelines will not be available for some time as OPR has until July 1, 2009, to draft the new greenhouse gas guidelines, and the State Resources Agency will thereafter have until January 1, 2010, to certify and adopt the regulations.

Despite the foregoing, the impact of the Proposed Action with respect to global climate change is evaluated in this Draft EIS/EIR by determining whether it would impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32. A project's consistency with the implementing programs and regulations to achieve the statewide GHG emission reduction goals established under AB 32 cannot be evaluated explicitly because they are still under development. However, in October 2008 CARB issued the AB 32 Proposed Scoping Plan, which identifies measures that will likely be included in the Final Scoping Plan that will be adopted by January 2009. For purposes of this Draft EIS/EIR:

- The Proposed Action will be considered not to impede the emissions reduction targets developed by the state pursuant to AB 32 if it is consistent with applicable AB 32 Proposed Scoping Plan measures.

4.16.5 METHODOLOGY FOR EVALUATING EFFECTS

The Proposed Action would result in emissions of GHGs due to fuel combustion in motor vehicles, mobile construction equipment, and building heating and water systems associated with the Campus and University Community and would contribute to the global GHG inventory. Building and motor vehicle air conditioning systems may also use HFCs (and HCFCs and CFCs to the extent that they have not been completely phased out at later dates), which may result in emissions through leaks. The other primary GHGs (perfluorocarbons and sulfur hexafluoride) are associated with specific industrial sources and are not expected to be associated with the Proposed Action.

The emissions of CO_2, the primary greenhouse gas associated with construction and operation of the Proposed Action were estimated using URBEMIS2007 (see **Section 4.3, Air Quality,** for a discussion of the use of URBEMIS2007 to estimate project emissions) with the following adjustments to convert CO_2 emissions to GHG emissions on a carbon dioxide equivalent (CO_2E) basis:

- Motor vehicles: The CO_2 emissions associated with construction workers, students, project residents and customers were multiplied by a factor based on the assumption that CO_2 represents 95 percent of the CO_2E emissions associated with passenger vehicles, which account for most of the project-related trips, and by 365 operational days per year (US EPA 2005).

- Area sources (natural gas combustion): The CO_2 emissions from natural gas consumption for the residential units were adjusted based on emission factors for CO_2, CH_4, and N_2O for natural gas combustion from the California Climate Action Registry's *General Reporting Protocol* (California Climate Action Registry [CCAR] 2008), the global warming potential for each GHG; and 365 days per year.

- Construction diesel trucks and equipment: No adjustment was made to the CO_2 emissions because the GHGs in the exhaust from diesel engines are almost entirely CO_2 (less than one percent CH_4 and N_2O on a CO_2 equivalent basis).

The Proposed Action would also result in indirect GHG emissions due to the electricity demands of the Campus and University Community. Emission factors for GHGs due to electrical demand from the Proposed Action's land uses were obtained from the CCAR *General Reporting Protocol* (CCAR 2008). This emission factor takes into account the mix of energy sources used to generate electricity in the State of California and the relative carbon intensities of these sources, and includes natural gas, coal, nuclear, large hydroelectric, and other renewable sources of energy. The estimated annual electrical demand for the Proposed Action was obtained from factors in the California Air Pollution Control Officers Association *CEQA and Climate Change* (CAPCOA 2008) whitepaper and the CCAR *General Reporting Protocol* (CCAR 2008).

Indirect GHG emissions would also be associated with the electrical demand resulting from the provision of water to the project site, electrical demand and process emissions due to wastewater treatment, and decomposition of solid waste generated by the Proposed Action. The electrical demand associated with supplying water to the project site was calculated based on the estimated water use (see **Section 4.14, Utilities and Service Systems** of the draft EIS/EIR); California Energy Commission estimates of electric use for water conveyance, treatment, and distribution (CEC 2005; CEC 2006b); and electrical generation factor from the CCAR *General Reporting Protocol* (CCAR 2008). The wastewater-related GHG emissions were calculated based on the estimated wastewater production (see **Section 4.14**) and state and federal estimates of GHGs associated with wastewater treatment (CEC 2006b; US EPA 2008b) and the electrical generation factor from the CCAR *General Reporting Protocol* (CCAR 2008). Lastly, the solid waste-related emissions were calculated based on the solid waste generation of the Proposed Action (see **Section 4.14**) and US EPA emission factors (US EPA 1998).

On-site vegetation currently reduces GHG emissions by sequestering carbon dioxide. GHG emissions would therefore increase as on-site vegetation is replaced with developed urban surfaces. These emissions were not estimated in the EIS/EIR but are not expected to be large because the on-site vegetation consists of annual grasslands, irrigated pasture, and crops, with only a few trees present along the boundary of the project site. Furthermore, these vegetation types would be replaced by landscaping which would increase the number of trees on the site and therefore in the long run would provide greater carbon sequestration.

GHG emissions were separately estimated for the Campus and University Community and then combined to present the total emissions that would result from the Proposed Action. The total estimated GHG emissions associated with construction and operation of the Proposed Action are shown in **Table 4.16-5, Proposed Action - Estimated Construction GHG Emissions,** and **Table 4.16-6, Proposed Action - Estimated Operational GHG Emissions**, respectively.

Table 4.16-5
Proposed Action – Estimated Construction GHG Emissions
(Metric Tons CO_2E Per Year)

Construction Year	Campus	University Community	Proposed Action
2009	236	473	709
2010	1,505	3,493	4,998
2011	1,504	3,485	4,989
2012	1,510	3,499	5,009
2013	1,510	3,501	5,011
2014	1,511	3,502	5,012
2015	1,511	3,502	5,014
2016	1,511	3,503	5,014
2017	1,506	3,490	4,996
2018	1,512	3,504	5,015
2019	1,512	3,504	5,015
2020	1,517	3,517	5,035
2021	1,512	3,505	5,017
2022	1,506	3,491	4,997
2023	1,506	3,491	4,997
2024	1,518	3,518	5,036
2025	1,512	3,505	5,017
2026	1,512	3,505	5,017
2027	1,512	3,505	5,017
2028	1,506	3,492	4,998
2029	1,512	3,505	5,017
2030	799	2,435	3,234

Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.3****.*

Table 4.16-6
Proposed Action – Estimated Operational GHG Emissions
(Metric Tons CO_2E Per Year)

Emission Source	Campus	University Community	Proposed Action
Direct GHG Emissions			
Operational (Mobile) Sources	72,910	196,101	269,011
Area/Stationary Sources	35,646	41,780	77,426
Total Direct GHG Emissions	108,556	237,881	346,437
Indirect GHG Emissions			
Electrical Generation	39,117	56,296	95,413
Water Supply	1,087	1,896	2,982
Wastewater Treatment	1,914	2,930	4,844
Solid Waste	841	1,786	2,627
Total Indirect GHG Emissions	42,959	62,908	105,866
Total	**151,515**	**300,789**	**452,303**

Source: Impact Sciences, Inc. Emissions calculations are provided in ***Appendix 4.3****.*

As noted earlier, no guidance exists to indicate what level of GHG emissions would be considered substantial enough to result in a significant adverse impact on global climate. However, it is generally the case that an individual project of any size is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory. Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). Accordingly, discussion of the Proposed Action's GHG emissions and their impact on global climate are addressed in terms of the Proposed Action's contribution to a cumulative impact on global climate. The University, as the CEQA lead agency for this EIR, acknowledges that additional direction on this topic is forthcoming from the OPR, which may affect the analysis presented below and/or require additional mitigation measures beyond those included in the following section.

4.16.6 ENVIRONMENTAL CONSEQUENCES OF PROPOSED ACTION AND ALTERNATIVES

4.16.6.1 Alternative 1 – Proposed Action

Alt 1 – Impact GCC-1: The Proposed Action would impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32. (*Significant; Significant and Unavoidable)*

Campus

Under Alternative 1, the campus portion of the Proposed Action would result in the development of campus facilities, which would accommodate approximately 25,000 full-time equivalent (FTE) students and associated faculty, staff, and post doctoral researchers for a total of 6,560 FTE employees. The campus facilities would include approximately 6.25 million square feet of academic and research building space; 1.0 million square feet of building space for student services; 1.25 million square feet of building space for campus services, such as one or more central plants, a logistical center for centralized receiving and corporation yard functions, fire and police stations, electrical substations, and water storage facilities; 400,000 square feet of athletic and recreational buildings; student housing with approximately 12,500 beds; approximately 15,500 parking spaces; and 140 acres of athletics and recreational land uses and open space.

Based on this development program, as shown in **Table 4.18-5,** the total annual GHG emissions from construction activities on the campus are estimated to be about 236 metric tons CO_2E in 2009 and just over 1,500 metric tons CO_2E each year after that. The annual operational emissions are also reported above in **Table 4.18-6** and are anticipated to be approximately 150,821 metric tons CO_2E. These emission estimates are provided in this Draft EIS/EIR for informational purposes; however, there are no numeric thresholds that can be used to evaluate the significance of these emissions. These emissions estimates may be used to develop mitigation measures to reduce GHG emissions, should additional mitigation measures beyond the programs and policies in place as part of the Proposed Action be needed based on the analysis below. The emissions estimates may also be useful to evaluate the effectiveness of such programs and policies and mitigation in the future in the context of project-level review.

As noted earlier, the Proposed Action's contribution to the global cumulative impact are evaluated in this EIS/EIR by determining whether it would conflict with programs and measures that the state is developing to comply with AB 32. Towards this end, the sustainable practices included in the 2009 LRDP are described first followed by a systematic evaluation of the proposed Campus project relative to pertinent measures included in ARB's Proposed Scoping Plan for the state's compliance with AB 32.

Creating and maintaining a campus that demonstrates sustainability is the central mandate of the 2009 LRDP. The 2009 LRDP establishes a significant sustainability goal for the campus—to have a zero energy, carbon, or waste footprint by 2020. Sustainable practices were included in the UC Merced 2002 LRDP adopted by the University in 2002. In 2007, the president of the University issued the Policy on Sustainable Practices, a more comprehensive version of its 2004 green building policy, which is summarized in preceding **Subsection 4.16.3.4**. The 2009 LRDP continues the 2002 LRDP's and the University's commitment per the Presidential Policy to implementing sustainable practices. The 2009 LRDP mandate is to establish a foundation that requires leading edge use of sustainable practices in all aspects of campus development. The 2009 LRDP creates a development framework—land use, circulation, and open space – that is specifically designed to minimize campus development footprint and impacts, including carbon impacts. The 2009 LRDP establishes directions and policies on design that mandate the use of broad based leading edge sustainable techniques in facility and infrastructure design and construction. It includes integration with the research initiatives and innovations that are part of the overall campus research program. For instance, UC Merced is establishing the Merced Energy Research Institute (MERI) that will conduct research to help insure California's leadership in sustainable energy futures, while at the same time educating energy leaders of the future. MERI will be an interdisciplinary research institute supporting the academic programs throughout UC Merced. The Institute will engage in research and development of advanced energy technologies to address current energy, economic and environmental problems in California, and provide unique and innovative educational experiences for students at all levels, and continuing educational support for the renewable energy community. Finally, the 2009 LRDP establishes directions and policies for operational systems to support the on-going practice of sustainability in campus life.

Therefore, the University will incorporate Leadership in Energy and Environmental Design (LEED) standards and principles in the design and construction of the campus. The University will pursue LEED Silver or greater certification for each new construction project in furtherance of incorporating energy conservation and sustainability measures into the campus. Campus building designs will be developed to maximize passive approaches to energy usage and reduce reliance on mechanical systems that involve significant energy demands. Buildings will also incorporate green roof designs to insulate rooftops from heat island effects, slow and filter rain runoff from rooftops, extend the life of the roof, and reduce energy use for cooling and heating. The buildings will incorporate use of waterless urinals, low flow toilets and low flow baths and showers. The campus will include open space such as passive open space, active and recreational open space, and interstitial open spaces between buildings. This open space system results in less building coverage and emphasizes the regional landscape of Merced and the Central Valley and Sierra foothills. The campus design will implement a variety of low impact development (LID) practices to minimize adverse impacts related to storm water runoff.

Table 4.16-7, Consistency of Campus Project Features with AB 32 Proposed Scoping Plan Measures, lists all pertinent measures included in CARB's Proposed Scoping Plan for the state's compliance with AB 32, and presents LRDP policies, programs, project design features, and mitigation measures in this Draft EIS/EIR that comply with the Proposed Scoping Plan measures.

Table 4.16-7
Consistency of Campus Project Features with AB 32 Proposed Scoping Plan Measures

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
SPM-1: California Cap-and-Trade Program linked to Western Climate Initiative	Not applicable.
SPM-2: California Light-Duty Vehicle GHG Standards	Not applicable.
SPM-3: Energy Efficiency	**TZC-1**: Zero Net Energy: Achieve zero net energy by 2020 through aggressive conservation efforts and development of renewable power. Zero net energy means producing the same amount of renewable energy that is consumed. Buildings will be designed to consume half of the energy and demand of other University buildings in California, surpass Title 24 minimum efficiency standards by 30%, and achieve all 10 LEED credits for optimizing energy efficiency. **DEL-6**: The campus shall develop Campus Standards, including Signage Standards, by codifying and updating current Draft Campus Standards to ensure consistency and compatibility of campus systems, efficiency of maintenance and interchangeability of fixtures and parts; and compliance with campus-wide LEED certifications. These standards shall address interior finishes and materials (i.e., ceiling tile, flooring, wallboards, etc.); MEP systems; low-voltage communications systems (i.e., data, voice, fire alarm, emergency notification, building security, and energy management, etc.); interior and exterior signage systems; site development standards (i.e., lighting, furnishings, solid waste collection area screening, paving and planting materials, tree planting construction details. **SUST-1**: Adhere to principles of sustainable environmental stewardship, conservation and habitat protection in the planning, design and construction of the campus and individual projects, adopting an approach of continuous improvement in the sustainability of campus development, operations and management. **SUST-2**: Design campus facilities to achieve US Green Building Council LEED Gold certification at a minimum, when employing all campus base credits. Establish a minimum of 20-25 LEED campus base credits by creating and implementing planning and design standards for all campus facilities. Temporary facilities (less than fifteen years life expectancy) shall strive for LEED Silver equivalence, unless recommended for exemption from policy by the Campus Physical Planning Committee and approved by the Chancellor.

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
SPM-3: Energy Efficiency (continued)	**SUST-3**: Create a unique architectural identity for the campus by employing passive environmental systems, such as shading, orientation and roof configuration, as design features on campus buildings; employing sustainable materials; and designing campus buildings to employ renewable energy production systems. **SUST-4**: Design buildings to maximize day lighting, occupant control over the interior environment, indoor air quality, and general indoor environmental quality. Wherever feasible and programmatically compatible, occupied building interiors should be naturally lit and naturally ventilated, as a priority in facility design. **SUST-5**: Design buildings to utilize exterior shading to reduce building cooling loads, and utilize circulation systems such as arcades, loggias, or porches to protect major entries to ground floor functions, reducing the need for environmentally conditioned space in areas of high traffic. **SUST-6**: Minimize grid connected peak electricity loads by shifting electricity used for cooling (approximately 25% of total) away from peak electricity demand periods through chilled water thermal storage, gas or cogeneration-driven cooling, and/or solar power. **SUST-7**: Install campus energy performance monitoring systems in all new buildings and other monitoring equipment to foster continuous improvement in indoor environmental quality and performance. These systems will enable optimization of campus operations, inform improved design of future phases of the campus, and make the campus a "Living Laboratory" for study of engineering and resource conservation. **SUST-11**: Utilize tree planting and other methods to shade buildings, walking and open activity areas, and reduce to heat island effects of roads and surface parking lots. **Mitigation Measures AQ-2a** through **2c** to minimize operational emissions (full text in Draft EIS/EIR **Section 4.3**)
SPM-4: Renewables Portfolio Standard	Not applicable.
SPM-5: Low Carbon Fuel Standard	Not applicable.
SPM-6: Regional Transportation-Related Greenhouse Gas Targets	**TZC-3:** Zero Net Carbon: Achieve zero net carbon emissions—carbon neutrality—by 2020. Minimize atmospheric carbon generation by campus operations and employ measures to mitigate carbon emissions such as aggressive tree planting. On-site and regional measures will be prioritized. **ENV-1:** Develop an interdisciplinary Academic Core with a 10-minute walking radius and shared open space.

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
	ENV-3: Develop distinct high-density student neighborhoods with residential building types that support the development of neighborhood identity, and that include student services, dining and recreation focused at neighborhood centers. **ENV-5:** Encourage the development of a two high density mixed use Main Streets lined with arcades and generous sidewalks as the central activity areas of an interdisciplinary Academic Core, with student housing, academic uses, (especially lecture halls and classrooms in order to create activity) student dining, student services, convenience retail, and areas for the community to relax and socialize. **COM-2/ENV-6**: Develop streetscapes within the campus with ample amenities such as landscaping, shade trees, generous sidewalks, street furniture, signage, lighting, and art to promote pedestrian movement, community attractiveness, and informal meeting spaces. **COM-5:** Ensure a supply of housing adequate to offer housing to 50% of FTE student population and allocate a range of housing types to accommodate undergraduate students, and graduate students. **MOB-1**: Ensure that the transportation infrastructure will adequately serve campus circulation needs, and provide appropriate connectivity to adjacent areas while minimizing impacts to those areas. **MOB-2**: Accommodate multiple modes including walking, cycling and public transit, as well as driving. **MOB-3**: Develop coordinated district master plans to guide design and implementation of the principal circulation infrastructure, including plans that address streets, bikeways, pedestrian ways, transit and parking. **MOB-6:** Create a comprehensive, interconnected bicycle and pedestrian circulation system that provides access to major campus destinations. The design of the bicycle and pedestrian system should be consistent with the following principles: • Design all campus vehicular streets (transit, service and general traffic) as bike-friendly streets, with calmed traffic speeds, adequate bike lanes, no parking or parallel parking only, and roundabouts rather than stop signs at intersections. • Minimize bike paths separate from and paralleling roadways, unless they can be designed in a manner that offers significant safety or direct access advantages over streets with integral bike lanes. • Separate pedestrians from cyclists, either in different corridors (or block grids) or, when using the same corridor, on a bikeway with a parallel but separate walkway. • Minimize the number of pedestrian/bicycle crossing points. Where bicycle and pedestrian paths cross, emphasize proven safe and efficient design treatments such as roundabouts and pedestrian refuges. Design bike paths and lanes for moderate but safe speeds at pedestrian and vehicular crossings (8–10 mph).

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
SPM-6: Regional Transportation-Related Greenhouse Gas Targets (continued)	• In the most dense areas of the campus core, design the bike grid to be at least two square blocks in scale, to avoid having each building surrounded by bike streets, and promote a more protected pedestrian realm and more efficient bike realm. • Design integrated and secure bicycle parking at residences, lecture halls, research facilities and student service buildings • Sidewalks shall be 10 feet wide at a minimum. **MOB-7**: Accompany each new building on campus with appropriate additions to the bicycle and pedestrian system, to ensure that the bicycle/pedestrian system expands to keep pace with campus development. **MOB-8**: Install amenities to serve bicyclists and pedestrians, such as water fountains, bicycle maintenance and repair tool, campus maps, secure bicycle parking and lockers, and showers and changing rooms. **MOB-9**: Link the campus bicycle system with regional bikeways to encourage utilitarian and recreational travel by bicycle. Prime candidates for campus-regional linkages include existing paths along Lake Road and Bellevue Road. **MOB-10**: Work cooperatively with transit providers to encourage transit-bicycle transfers by installing bike racks on all transit vehicles. **MOB-11**: Develop a comprehensive public information strategy to publicize bicycle-and pedestrian-related pathways, networks, rules and regulations. **MOB-12**: Provide high frequency, safe and convenient transit services that seamlessly connect major activity centers on campus and in the neighboring University Community. Primary transit destinations would include the campus core, the Town Center, the Gateway District outlying commuter parking facilities, and key locations within on-campus and off-campus housing areas. Each building in the campus core should be within a 5-minute walk of a transit stop. **MOB-13**: Work with local and regional transit providers to coordinate transit service, and establish convenient transfers between transit and other modes of travel. Integrate transit corridors with the City of Merced transit corridors. **MOB-14**: Contribute to development of a transit hub at the interface between the Town Center and campus core, for timed transfers between local and regional transit connections. **MOB-15**: Develop a transit fare policy and transit pass system that provides maximum convenience and incentives for transit ridership among University students and employees. **MOB-20**: Provide priority parking for vanpools, carpools, and energy-efficient and low-pollution vehicles, with recharge stations for electric vehicles and provide a natural gas vehicle charging stations. Provide leadership by using alternative fuel or other low-emission vehicles in the campus service fleet.
SPM-7: Vehicle Efficiency Measures	Not applicable.
SPM-8: Goods Movement	Not applicable.

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
SPM-9: Million Solar Roofs Program	**TZC-1**: Zero Net Energy: Achieve zero net energy by 2020 through aggressive conservation efforts and development of renewable power. Zero net energy means producing the same amount of renewable energy that is consumed. Buildings will be designed to consume half of the energy and demand of other University buildings in California, surpass Title 24 minimum efficiency standards by 30%, and achieve all 10 LEED credits for optimizing energy efficiency. **SUST-6:** Minimize grid connected peak electricity loads by shifting electricity used for cooling (approximately 25% of total) away from peak electricity demand periods through chilled water thermal storage, gas or cogeneration-driven cooling, and/or solar power.
SPM-10: Heavy/Medium-Duty Vehicles	**Mitigation Measure AQ-1a** through **1c** to minimize construction emissions (full text in Draft EIS/EIR **Section 4.3**)
SPM-11: Industrial Emissions	Not applicable.
SPM-12: High Speed Rail	Not applicable.
SPM-13: Green Building Strategy	**TZC-1**: Zero Net Energy: Achieve zero net energy by 2020 through aggressive conservation efforts and development of renewable power. Zero net energy means producing the same amount of renewable energy that is consumed. Buildings will be designed to consume half of the energy and demand of other University buildings in California, surpass Title 24 minimum efficiency standards by 30%, and achieve all 10 LEED credits for optimizing energy efficiency. **DEL-6**: The campus shall develop Campus Standards, including Signage Standards, by codifying and updating current Draft Campus Standards to ensure consistency and compatibility of campus systems, efficiency of maintenance and interchangeability of fixtures and parts; and compliance with campus-wide LEED certifications. These standards shall address interior finishes and materials (i.e., ceiling tile, flooring, wallboards, etc.); MEP systems; low-voltage communications systems (i.e., data, voice, fire alarm, emergency notification, building security, and energy management, etc.); interior and exterior signage systems; site development standards (i.e., lighting, furnishings, solid waste collection area screening, paving and planting materials, tree planting construction details. **SUST-2**: Design campus facilities to achieve US Green Building Council LEED Gold certification at a minimum, when employing all campus base credits. Establish a minimum of 20–25 LEED campus base credits by creating and implementing planning and design standards for all campus facilities. Temporary facilities (less than 15 years life expectancy) shall strive for LEED Silver equivalence, unless recommended for exemption from policy by the Campus Physical Planning Committee and approved by the Chancellor.
SPM-14: High GWP Gases	Not applicable.
SPM-15: Recycling and Waste	**TZC-2**: Zero Waste: Achieve zero landfill waste by 2020. Minimize the generation of solid waste on campus through green packaging purchase requirements and other initiatives to reduce and recycle waste, while undertaking an aggressive recycling program for construction and other campus waste streams.

Scoping Plan Measure	LRDP Policy/Project Feature/Mitigation Measure
SPM-16: Sustainable Forests	Not applicable.
SPM-17: Water	**COM-7**: Locate uses to respect the site's natural drainage to the extent feasible. **SUST-8:** Explore the feasibility of achieving water neutrality by determining UC Merced's "water footprint" (i.e., consumptive use of rainwater [green water], consumptive use of water withdrawn from groundwater or surface water (blue water) and pollution of water [grey water]); Establish water footprint reduction targets for UC Merced and employ mechanisms to offset the environmental and social impacts of residual water footprints, such as, employing state of the art technologies, education, modeling new and cost-effective approaches in design and product selection. **SUST-9**: Minimize consumption of potable water resources through the design of landscapes that minimize the use of irrigation water after the plants' initial growing phase, providing for use of recycled water for all irrigation. Explore feasibility of seasonal use of irrigation water from MID. **SUST-10**: Design campus landscaping to emphasize regional natives, avoid invasive or allergenic species, and select plantings that are compatible with campus infrastructure, developing a palette of approved plant, groundcover and tree lists, as well as landscape design guidelines. **SUST-12**: Design roadways, parking lots and circulation pathways to minimize, detain and filter storm water runoff. **MOB-18**: Develop major parking lots with permeable or gravel surfaces on the periphery of the campus core, at strategic intercept points along regional access routes. **SER-5**: Provide for the short-and long-term collection and treatment of campus wastewater, initially by the City of Merced's Wastewater Treatment Facility, with the possible long-term addition of a recycled water treatment facility either on the Campus or in the University Community, which will allow the campus to augment its other water supplies and create a source for recycled and industrial water, biomass energy and compost. **SER-6:** Minimize water use by permitting spray irrigation only in large turf areas, primarily used for formally landscaped, organized recreation or athletic fields. Irrigation systems will be designed to utilize smart controls, such as using information gathered from local weather stations, and tailored to soil types and plant types, adjusting water distribution on a daily basis as needed, thus minimizing runoff.
SPM-18: Agriculture	Not applicable.

Source: Impact Sciences, Inc., (2008).

As the table above shows, 2009 LRDP goals and policies and the programs that the Campus has developed in addition to the University's Policy for Sustainable Practices collectively would support the

applicable measures in the Proposed Scoping Plan. There are no applicable scoping plan measures that would not be addressed by the 2009 LRDP and other UC programs and the Campus' development program is thus consistent with applicable AB 32 Proposed Scoping Plan measures. Therefore, the development of the Campus would not impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32 and would not result a contribution to global climate change that would be cumulatively considerable.

With respect to the GHG emissions presented above for the Campus, it should be noted that the emissions estimates do not reflect "business as usual" emissions as they already incorporate emissions reductions associated with transportation demand management measures, water conservation, energy conservation, and solid waste reduction. However, they do not capture the full extent of emissions reductions that the Campus will achieve from the implementation of all of the policies contained in the 2009 LRDP. For instance, although the total electrical generation emissions reported in **Table 4.18-7** for the Campus project are based on the estimated total demand for electricity at full development assuming LEED® Silver certified buildings and other energy efficiencies, the estimated emissions presented for this source are based on the assumption that all the electricity will be purchased from the grid and are not discounted for alternate and renewable energy that the Campus would generate on-site nor the Campus' purchase of green energy from the grid. Based on the range of programs that the Campus has developed and the Campus's goal to achieve net-zero energy, carbon, and waste by 2020, the Campus's emissions by full development would be well below business as usual emissions and below the emissions estimates presented in this Draft EIS/EIR. Furthermore, in compliance with the University's Policy for Sustainable Practices, the Campus will develop a Climate Action Plan by December 2008 which will establish baseline emissions for the campus and will include all of the programs described above to reduce GHG emissions and monitoring of the progress of these programs to ensure that the campus achieves its triple-zero commitment: to consume no off site or non-renewable energy, produce no net carbon emissions, and produce no solid waste for landfill disposal by 2020. Lastly, some additional emissions reductions via carbon sequestration would be achieved by the Campus project because it would place more than 26,000 acres of land under conservation easements.

University Community

Under Alternative 1, the Proposed Action includes the construction and operation of the University Community, which would occupy approximately 1,951 acres of land and would be developed with high-, medium-, and low-density housing for a total of 11,616 dwelling units, non-residential building space totaling about 3.7 million square feet, parking, parks, schools, and open space for passive recreation.

Based on this development program, as shown in **Table 4.18-5,** the total annual GHG emissions from construction activities are estimated to be about 473 metric tons CO_2E in 2009 and about 3,500 metric tons CO_2E each year after that. The operational emissions are also reported above in **Table 4.18-6** and are anticipated to be approximately 300,789 metric tons CO_2E. As noted earlier, this information is provided in this Draft EIS/EIR for informational purposes as there are no numeric thresholds that can be used to evaluate the significance of these emissions.

As noted above, the Proposed Action's contribution to the global cumulative impact is evaluated in this Draft EIS/EIR by determining whether it would conflict with programs and measures that the state is developing to comply with AB 32. Towards this end, the specific objectives of the University Community which relate to sustainability and the reduction of environmental impacts are presented below, followed by a systematic evaluation of the proposed University Community project relative to pertinent measures included in ARB's Proposed Scoping Plan for the state's compliance with AB 32.

The specific objectives of the University Community are to support the successful development of the UC Merced Campus by providing for a community that is physically contiguous to and integrated with the Campus. Based on the experience of developing the other nine UC campuses, the University determined that the success of a modern major research university in California depends on a planned associated, contiguous, and supporting community that provides housing and other amenities for faculty, staff, and students. Without such planning, communities tend to develop around a campus in a piecemeal, random fashion, which leads to escalating land values, subsequently forcing employees to locate at some distance from the campus. A contiguous location of a campus and its supporting community is desirable also because it would encourage pedestrian and bicycle transit and would further reduce the need for automobiles, minimizing transportation and air quality impacts resulting from commuting by staff, students, faculty, and visitors. A well-planned community adjacent to a campus also would also help preserve the natural habitat by increasing density and focusing development. Therefore, the University Community has been designed to absorb the equivalent of 100 percent of the new growth generated by the Campus over time in close proximity to the Campus to avoid the adverse effects of new development.

The development of the University Community would be guided by the University Community Plan (UCP) adopted by the County in 2004, includes numerous sustainability policies focused on reducing air emissions from all sources. In addition, because the northern portion of the University Community, Community North, is owned by University Community Land Company (UCLC), a not-for-profit organization composed of the University and Virginia Smith Trust, the development of the Community North would be guided by all of the University's commitments under the Presidential Policy for Sustainable Practices described above.

The proposed University Community's contribution to the global cumulative impact is evaluated in this Draft EIS/EIR by determining whether the UCP would conflict with programs and measures that the state is developing to comply with AB 32. **Table 4.18-8, Consistency of University Community Project Features with AB 32 Proposed Scoping Plan Measures,** lists all pertinent measures included in ARB's Proposed Scoping Plan for the state's compliance with AB 32, and presents UCP policies, project design features (in the case of Community North), and mitigation measures included in this Draft EIS/EIR that support or conflict with the scoping plan measures.

Table 4.16-8
Consistency of University Community Project Features with AB 32 Proposed Scoping Plan Measures

Scoping Plan Measure	UCP Policy/Project Feature/Mitigation Measure
SPM-1: California Cap-and-Trade Program linked to Western Climate Initiative	Not applicable.
SPM-2: California Light-Duty Vehicle GHG Standards	Not applicable.
SPM-3: Energy Efficiency	**Policy AQ 4.1**: Implement energy conservation policies defined in the Energy policy section of the University Community Plan. **Policy AQ 6.1**: Require the installation of low-emitting, US EPA-certified wood-burning appliances or natural gas fireplaces in residential developments. **Mitigation Measures AQ-2a** through **2c** to minimize operational emissions (full text in Draft EIS/EIR **Section 4.3)**
SPM-4: Renewables Portfolio Standard	Not applicable.
SPM-5: Low Carbon Fuel Standard	Not applicable.
SPM-6: Regional Transportation-Related Greenhouse Gas Targets	**Policy AQ 1.2**: Work with the City of Merced and other jurisdictions and agencies to address cross-jurisdictional and regional transportation and air quality issues. Encourage staff planners to participate in activities of neighboring jurisdictions and regional agencies. The aim would be to examine congestion in other jurisdictions caused by University Community projects, effects of projects on viability of regional transit and pedestrian-oriented projects, progress of jurisdictions to construct segments regional bikeway plans, proposed land use or circulation changes that would alter traffic flow or increase urban sprawl in jurisdictions. **Policy AQ 2.1**: Integrate planning efforts by considering air quality when planning land use and transportation systems and considering air quality and mobility when reviewing any proposed change to the land use pattern.

Scoping Plan Measure	UCP Policy/Project Feature/Mitigation Measure
SPM-6: Regional Transportation-Related Greenhouse Gas Targets (continued)	**Policy AQ 2.2**: Develop a congestion management plan to reduce motor vehicle trips, as defined by the UCP's transportation policies (T 7.1 to 7.4). These include policies for (a) the provision of grid streets and "flexible corridors" that provide travel-mode options and future capacity and (b) street design standards for bicyclists, pedestrians, and traffic calming. **Policy AQ 2.3**: Establish land use pattern, densities, and pedestrian-enhanced infrastructure, in accordance with Land Use policies, to encourage the use of alternative transportation modes and reduce the length and number of motor vehicle trips. These encompass policies to manage the density and intensity of development; develop a planned "heart" of the community, parklands, pedestrian-oriented mixed use districts, neighborhood convenience commercial, neighborhood schools, and centralized large-scale commercial and office uses in village centers with appropriate transportation services; as well as compact and orderly outward expansion of contiguous development and infrastructure through "land use phasing" and urban limit lines. **Policy AQ 2.4**: Design streetscapes, housing, and village centers to improve access by pedestrians and bicyclists. Land Use policies provide a structure that maximizes pedestrian activity and transit use. **Policy AQ 2.5**: Implement a transportation infrastructure that provides opportunity for reduced trip lengths and minimized new trips while anticipating a multi-modal system in accordance with Transportation policies. This should include internal and regional public transit systems, supporting transit infrastructure and amenities (shelters, benches, bus turnouts, route signs, park and ride lots, and so on), multi-modal connections to regional transportation system (airports and passenger rail facilities), a comprehensive system of bikeways, required bicycle storage and parking at appropriate sites, and infrastructure for telecommunication facilities. **Policy AQ 2.6**: Require the installation of electrical outlets in residential garages and commercial and office parking structures/lots for the use of electrical vehicles. **Policy AQ 7.1**: Identify opportunities for and encourage the procurement and use of alternative fuel vehicle fleets by large employers in the University Community and UC Merced. Collaborate with UC Merced on an alternative fuel vehicle shuttle system servicing the Campus, the University Community, and the City of Merced. **Policy T 4.1**: Create a complete, interconnected bicycle and pedestrian circulation system that serves both commuter and recreational travel, and provides access to major destinations. **Policy T 4.2**: Work with UC Merced to establish convenient pedestrian and bicycle access routes to and through Campus. **Policy T 4.3**: Install amenities to serve bicyclists and pedestrians, such as secure and convenient bicycle parking and shaded seating areas at public facilities.

Scoping Plan Measure	UCP Policy/Project Feature/Mitigation Measure
SPM-6: Regional Transportation-Related Greenhouse Gas Targets (continued)	**Policy T 4.4**: Establish bicycle-parking standards for new development. **Policy T 4.5**: Work with the transit provider to encourage transit-bicycle transfers by installing bike racks on buses. **Policy T 5.1**: Provide high-frequency transit services that seamlessly connect major destinations, including the UC Merced Campus. Encourage convenient transfers between transit and other modes of travel. **Policy T 5.1**: Provide high-frequency transit services that seamlessly connect major destinations, including the UC Merced Campus. Encourage convenient transfers between transit and other modes of travel. **Policy T 5.2**: Work proactively with local and regional transit providers to coordinate transit service. Work with transit providers, the regional Air Pollution Control District, and public utility providers to encourage actions that reduce pollution from transit vehicles (such as purchasing vehicles that use alternative fuels, and providing fueling/charging stations). **Policy T 5.3**: Establish a transit hub at the interface between the town center and Campus core for timed transfers between local Campus/Community transit service and regional transit connections serving the City of Merced, the rest of Merced County, and major interregional destinations. **Policy T 5.4**: Work with UC Merced to design a transit fare policy and transit pass system that provides maximum incentives for transit ridership for University students and employees. **Policy T 5.5**: Establish development standards, such as inclusion of handicap-accessible bus stops and shelters, to make transit attractive. Require development to fund its share of necessary transit facilities. **Policy T 5.6:** Establish a County/City/University transportation clearinghouse and website that provides information on local transit services and alternative travel options. **Policy T 7.1**: Encourage non-residential developments to offer telecommute and flexible work-hour opportunities, and provide employee incentives for using transit, ridesharing, bicycling and walking. **Policy T 7.2**: Locate parking at strategic intercept points to minimize driving into and through central areas of the Community and Campus. Serve remote parking with frequent transit shuttles. **Policy T 7.3**: Promote ridesharing through public information and outreach. **Policy T 7.4**: Encourage non-residential developments to provide amenities for bicyclists, including showers and changing facilities. **Policy LU 4.1**: Concentrate land uses to minimize impacts on natural environmental resources and agricultural uses, and maximize the efficiency of supporting infrastructure, community/ pedestrian activity, and transit use.

Scoping Plan Measure	UCP Policy/Project Feature/Mitigation Measure
SPM-6: Regional Transportation-Related Greenhouse Gas Targets (continued)	**Policy LU 4.3**: Site and design land uses and buildings to maximize the Community's quality of life, including the establishment of pedestrian-oriented mixed-use districts and residential neighborhoods that reflect the traditional qualities of Merced, while providing opportunities for innovative and creative forms of development. **Policy LU 4.4**: Locate the highest development densities within and adjacent to the Town Center and primary transit corridors and stations to support community activity and transit use. Prioritize areas adjacent to the Town Center and Campus as housing locations for UC Merced students, faculty, and staff. **Policy LU 5.8**: Develop the Town Center with the highest densities in the University Community to reinforce its role as the "heart" of the community and foster pedestrian and transit use, according to the following standards: Retail and office uses (free standing): minimum floor area ratio (FAR) of 0.4 and maximum of 3.0 (one to six stories), Mixed use: minimum FAR of 1.5 and maximum 3.0, (housing/retail or office) with a minimum FAR of 0.35 and maximum of 1.0 for retail or office components (three to six stories) Residential: minimum of 18 and maximum of 32 units per net acre (two to four stories) **Policy LU 5.16:** Develop and design public streetscapes to enhance pedestrian activity including the integration of landscape, street furniture, signage, lighting, public art, distinctive paving materials, and other amenities. Local and/or Campus artists should be involved in the design of streetscapes, in lieu of the exclusive use of traditional "catalogue" elements, to impart a distinctive character and enhance ownership by the community.
SPM-7: Vehicle Efficiency Measures	Not applicable.
SPM-8: Goods Movement	Not applicable.
SPM-9: Million Solar Roofs Program	**Policy IE 1.2:** Encourage the development of a diversified energy system that relies on electricity generated from nonrenewable resources and natural gas only when they are the best solution and instead uses renewable resources (e.g., solar and wind) and passive energy systems (e.g., natural light and ventilation) to the extent possible. **Policy IE 1.4:** Consider the use of portions of the UCP site and/or nearby properties for the development of alternative energy generation facilities (e.g., solar collectors or wind generators) that would reduce the dependency upon electricity generated from nonrenewable resources or natural gas supply. **Policy IE 4.1:** Require all new subdivisions to maximize, to the extent feasible, proper orientation of lots with regard to solar utilization. Require easements on subdivision and parcel maps to protect solar access for individual lots.

Scoping Plan Measure	UCP Policy/Project Feature/Mitigation Measure
SPM-9: Million Solar Roofs Program (continued)	**Policy IE 4.6:** Emphasize natural versus mechanical energy systems and those that depend upon, or facilitate the use of, non-fossil energy sources (e.g., solar, wind, geothermal wells, fuel cell technology, and cogeneration).
SPM-10: Heavy/Medium-Duty Vehicles	**Policy AQ 5.2**: Promote the use of alternative fuel construction equipment, where feasible, and the use of low emission on-site stationary equipment. **Policy AQ 5.3**: Limit the hours of operation of heavy-duty construction equipment and the amount of construction equipment in use at any time. **Mitigation Measure AQ-1a** through **1c** to minimize construction emissions (full text in DEIS/EIR **Section 4.3**)
SPM-11: Industrial Emissions	Not applicable.
SPM-12: High Speed Rail	Not applicable.
SPM-13: Green Building Strategy	**Policy AQ 4.1**: Implement energy conservation policies defined in the Energy policy section of the University Community Plan.
SPM-14: High GWP Gases	Not applicable.
SPM-15: Recycling and Waste	**Policy ISW 2.2:** Ensure that solid wastes from non-residential uses in the University Community are recycled at an approved materials recycling facility. **Policy ISW 2.3:** Encourage the development of curbside recycling of yard wastes and other recyclables. **Policy ISW 2.4:** Support programs that promote home composting. **Policy ISW 2.5:** Collaborate with UC Merced in the implementation of recycling, composting and source reduction programs. **Policy ISW 2.6:** Promote community awareness of recycling and composting program activities and services in collaboration with the City of Merced and UC Merced. **Policy ISW 2.7:** Require that developers work with the Integrated Waste Management Board of Merced County to implement recycling programs for construction materials to reduce the amount of waste disposed of at the landfill.
SPM-16: Sustainable Forests	Not applicable.
SPM-17: Water	**Policy LU 4.1**: Concentrate land uses to minimize impacts on natural environmental resources and agricultural uses, and maximize the efficiency of supporting infrastructure, community/ pedestrian activity, and transit use.
SPM-18: Agriculture	Not applicable.

Source: Impact Sciences, Inc., (2008).

As this table above shows, the UCP policies listed above (and the programs that the Campus has developed in response to the University's Policy for Sustainable Practices that would apply to Community North) would support the applicable measures in the Proposed Scoping Plan. Nonetheless, the University Community would result in GHG emissions that are of a sizeable magnitude. Therefore, the development of the community could potentially impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32 and would result a contribution to global climate change that would be cumulatively considerable. The impact would be significant.

Conclusion

The Proposed Action would result in GHG emissions of approximately 451,609 metric tons per year (0.45 million metric tons). Compared to the estimated GHGs from all sources in California, the Proposed Action's contribution to global climate would be imperceptible. Based on these estimates, the Proposed Action would add approximately 0.09 percent to California's GHG emissions inventory (484 million metric tons, including out-of-state electrical generation). Based on the analysis in **Tables 4.18-7** and **4.18-8**, the Proposed Action would reduce its contribution to GHG emissions and global climate due to its consistency with these strategies and measures. In addition, the Proposed Action would incorporate other project features, such as proximity to commercial centers and public services that would result in lower fuel combustion emissions, reduced energy usage, water conservation, and other collateral benefits with respect to GHG emissions.[7]

The following tables, **Table 4.16-9, Attorney General's Recommended Mitigation Measures**, **Table 4.16-10, Attorney General's Recommended General Plan Mitigation Measures**, and **Table 4.16-11, Office of Planning and Research Suggested Mitigation Measures**, present mitigation measures recommended by the Attorney General's office and OPR for lead agencies to consider in the development and approval of projects. Many of these measures are already covered by the policies contained in the 2009 LRDP and the UCP, as well as by design features and mitigation measures included in this EIS/EIR. An "X" indicates that the measure is already addressed by policies and features of the Proposed Action. An "F" indicates that the measure is either ongoing or recommended for future implementation. "N/A" indicates that the measure is not applicable. A "--" indicates that no information is available to determine whether the measure is part of the existing plans or would be implemented in the future.

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7 Project design features and mitigation measures that are intended to reduce criteria pollutant emissions associated with fuel combustion (e.g., motor vehicle emissions) or energy conservation would also serve to reduce GHG emissions.

Table 4.16-9
Attorney General's Recommended "Project Level" Mitigation Measures

ID	Suggested Mitigation Measures	Campus	Community
Energy Efficiency			
GCC-1-1	Design buildings to be energy efficient. Site buildings to take advantage of shade, prevailing winds, landscaping and sun screens to reduce energy use.	X	X
GCC-1-2	Install efficient lighting and lighting control systems. Use daylight as an integral part of lighting systems in buildings.	X	X
GCC-1-3	Install light colored "cool" roofs, cool pavements, and strategically placed shade trees.	F	--
GCC-1-4	Provide information on energy management services for large energy users.	X	--
GCC-1-5	Install energy efficient heating and cooling systems, appliances and equipment, and control systems.	X	--
GCC-1-6	Install light emitting diodes (LEDs) for traffic, street and other outdoor lighting.	X	--
GCC-1-7	Limit the hours of operation of outdoor lighting.	F	--
GCC-1-8	Use solar heating, automatic covers, and efficient pumps and motors for pools and spas.	X	--
GCC-1-9	Provide education on energy efficiency.	X	--
Renewable Energy			
GCC-1-10	Install solar and wind power systems, solar and tankless hot water heaters, and energy-efficient heating ventilation and air conditioning. Educate consumers about existing incentives.	X	X
GCC-1-11	Install solar panels on carports and over parking areas.	X	X
GCC-1-12	Use combined heat and power in appropriate applications.	X	--
Water Conservation and Efficiency			
GCC-1-13	Create water-efficient landscapes.	X	X
GCC-1-14	Install water-efficient irrigation systems and devices, such as soil moisture-based irrigation controls.	F	--
GCC-1-15	Use reclaimed water for landscape irrigation in new developments and on public property. Install the infrastructure to deliver and use reclaimed water.	X	X
GCC-1-16	Design buildings to be water-efficient. Install water-efficient fixtures and appliances.	X	X
GCC-1-17	Use graywater. (Graywater is untreated household wastewater from bathtubs, showers, bathroom washbasins, and water from clothes washing machines.) For example, install dual plumbing in all new development allowing graywater to be used for landscape irrigation.	F	F
GCC-1-18	Restrict watering methods (e.g., prohibit systems that apply water to non-vegetated surfaces) and control runoff.	X	X

ID	Suggested Mitigation Measures	Campus	Community
GCC-1-19	Restrict the use of water for cleaning outdoor surfaces and vehicles.	F	--
GCC-1-20	Implement low-impact development practices that maintain the existing hydrologic character of the site to manage storm water and protect the environment. (Retaining stormwater runoff on site can drastically reduce the need for energy-intensive imported water at the site.)	X	X
GCC-1-21	Devise a comprehensive water conservation strategy appropriate for the project and location. The strategy may include many of the specific items listed above, plus other innovative measures that are appropriate to the specific project.	X	X
GCC-1-22	Provide education about water conservation and available programs and incentives.	X	X
Solid Waste Measures			
GCC-1-23	Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, concrete, lumber, metal, and cardboard).	X	X
GCC-1-24	Provide interior and exterior storage areas for recyclables and green waste and adequate recycling containers located in public areas.	X	--
GCC-1-25	Recover by-product methane to generate electricity.	--	--
GCC-1-26	Provide education and publicity about reducing waste and available recycling services.	X	--
Land Use Measures			
GCC-1-27	Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.	X	X
GCC-1-28	Educate the public about the benefits of well-designed, higher density development.	X	X
GCC-1-29	Incorporate public transit into project design.	X	X
GCC-1-30	Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.	X	X
GCC-1-31	Develop "brownfields" and other underused or defunct properties near existing public transportation and jobs.	X	X
GCC-1-32	Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.	X	X
Transportation and Motor Vehicles			
GCC-1-33	Limit idling time for commercial vehicles, including delivery and construction vehicles.	F	--
GCC-1-34	Use low or zero-emission vehicles, including construction vehicles.	F	--
GCC-1-35	Promote ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading and waiting areas for ride sharing vehicles, and providing a web site or message board for coordinating rides.	X	X

ID	Suggested Mitigation Measures	Campus	Community
GCC-1-36	Create car-sharing programs. Accommodations for such programs include providing parking spaces for the car share vehicles at convenient locations accessible by public transportation.	F	--
GCC-1-37	Create local "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems.	F	--
GCC-1-38	Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations.	F	--
GCC-1-39	Increase the cost of driving and parking private vehicles by, e.g., imposing tolls and parking fees.	F	--
GCC-1-40	Build or fund a transportation center where various public transportation modes intersect.	X	X
GCC-1-41	Provide shuttle service to public transit.	X	X
GCC-1-42	Provide public transit incentives such as free or low-cost monthly transit passes.	X	--
GCC-1-43	Promote "least polluting" ways to connect people and goods to their destinations.	X	--
GCC-1-44	Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.	X	X
GCC-1-45	Incorporate bicycle-friendly intersections into street design.	X	X
GCC-1-46	For commercial projects, provide adequate bicycle parking near building entrances to promote cyclist safety, security, and convenience. For large employers, provide facilities that encourage bicycle commuting, including, e.g., locked bicycle storage or covered or indoor bicycle parking.	X	--
GCC-1-47	Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.	X	--
GCC-1-48	Work with the school district to restore or expand school bus services.	F	--
GCC-1-49	Institute a telecommute work program. Provide information, training, and incentives to encourage participation. Provide incentives for equipment purchases to allow high-quality teleconferences.	F	--
GCC-1-50	Provide information on all options for individuals and businesses to reduce transportation-related emissions. Provide education and information about public transportation.	F	--

Source: Department of Justice, The California Environmental Quality Act – Addressing Global Warming Impacts at the Local Agency Level, *http://ag.ca.gov/globalwarming/pdf/ GW_mitigation_measures.pdf., 2008.*

Table 4.16-10
Attorney General's Recommended General Plan Mitigation Measures

ID	Suggested Mitigation Measures	Campus	Community
Conservation Element			
GCC-2-1	Climate Action Plan or Policy: Include a comprehensive climate change action plan that requires a baseline inventory of greenhouse gas emissions from all sources by a date certain; greenhouse gas emissions reduction targets and deadlines; and enforceable greenhouse gas emissions reduction measures.	X	--
GCC-2-2	Climate Action Plan Implementation Program: Include mechanisms to ensure regular review of progress toward the emission reduction targets established by the Climate Action Plan, report progress to the public and responsible officials, and revise the plan as appropriate, using principles of adaptive management. Allocate funding to implement the plan. Fund staff to oversee implementation of the plan.	X	--
GCC-2-3	Strengthen local building codes for new construction and renovation to require a higher level of energy efficiency.	X	X
GCC-2-4	Require that all new government buildings, and all major renovations and additions, meet identified green building standards.	X	X
GCC-2-5	Adopt a "Green Building Program" to require or encourage green building practices and materials. The program could be implemented through, e.g., a set of green building ordinances.	X	X
GCC-2-6	Require orientation of buildings to maximize passive solar heating during cool seasons, avoid solar heat gain during hot periods, enhance natural ventilation, and promote effective use of daylight. Orientation should optimize opportunities for on-site solar generation.	X	--
GCC-2-7	Provide permitting-related and other incentives for energy efficient building projects, e.g., by giving green projects priority in plan review, processing and field inspection services.	X	X
GCC-2-8	Conduct energy efficiency audits of existing buildings by checking, repairing, and readjusting heating, ventilation, air conditioning, lighting, water heating equipment, insulation, and weatherization. Offer financial incentives for adoption of identified efficiency measures.	X	--
GCC-2-9	Partner with community services agencies to fund energy efficiency project, including heating, ventilation, air conditioning, lighting, water heating equipment, insulation, and weatherization, for low-income residents.	N/A	--
GCC-2-10	Target local funds, including redevelopment and Community Development Block Grant resources, to assist affordable housing developers in incorporating energy efficient designs and features.	N/A	--
GCC-2-11	Provide innovative, low-interest financing for energy efficiency and alternative energy projects. For example, allow property owners to pay for energy efficiency improvements and solar system installation through long-term assessments on individual property tax bills.	N/A	--

ID	Suggested Mitigation Measures	Campus	Community
GCC-2-12	Fund incentives to encourage the use of energy efficient vehicles, equipment and lighting. Provide financial incentives for adoption of identified efficiency measures.	F	--
GCC-2-13	Require environmentally responsible government purchasing. Require or give preference to products that reduce or eliminate indirect greenhouse gas emissions, e.g., by giving preference to recycled products over those made from virgin materials.	X	X
GCC-2-14	Require that government contractors take action to minimize greenhouse gas emissions, e.g., by using low or zero-emission vehicles and equipment.	X	X
GCC-2-15	Adopt a "heat island" mitigation plan that requires cool roofs, cool pavements, and strategically placed shade trees. (Darker colored roofs, pavement, and lack of trees may cause temperatures in urban environments to increase by as much as 6–8 degrees Fahrenheit as compared to surrounding areas. Adopt a program of building permit enforcement for re-roofing to ensure compliance with existing state building requirements for cool roofs on non-residential buildings.	F	--
GCC-2-16	Adopt a comprehensive water conservation strategy. The strategy may include, but not be limited to, imposing restrictions on the time of watering, requiring water-efficient irrigation equipment, and requiring new construction to offset demand so that there is no net increase in water use.	X	X
GCC-2-17	Adopt water conservation pricing, e.g., tiered rate structures, to encourage efficient water use.	N/A	X
GCC-2-18	Adopt water-efficient landscape ordinances.	N/A	X
GCC-2-19	Strengthen local building codes for new construction and implement a program to renovate existing buildings to require a higher level of water efficiency.	N/A	X
GCC-2-20	Adopt energy and water efficiency retrofit ordinances that require upgrades as a condition of issuing permits for renovations or additions, and on the sale of residences and buildings.	N/A	X
GCC-2-21	Provide individualized water audits to identify conservation opportunities. Provide financial incentives for adopting identified efficiency measures.	N/A	--
GCC-2-22	Provide water audits for large landscape accounts. Provide financial incentives for efficient irrigation controls and other efficiency measures.	F	--
GCC-2-23	Require water efficiency training and certification for irrigation designers and installers, and property managers.	F	--
GCC-2-24	Implement or expand city or countywide recycling and composting programs for residents and businesses. Require commercial and industrial recycling.	N/A	X
GCC-2-25	Extend the types of recycling services offered (e.g., to include food and green waste recycling).	F	--
GCC-2-26	Establish methane recovery in local landfills and wastewater treatment plants to generate electricity.	N/A	X

ID	Suggested Mitigation Measures	Campus	Community
GCC-2-27	Implement Community Choice Aggregation (CCA) for renewable electricity generation. (CCA allows cities and counties, or groups of them, to aggregate the electric loads of customers within their jurisdictions for purposes of procuring electrical services. CCA allows the community to choose what resources will serve their loads and can significantly increase renewable energy.)	N/A	--
GCC-2-28	Preserve existing conservation areas (e.g., forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas) that provide carbon sequestration benefits.	X	--
GCC-2-29	Establish a mitigation program for development of conservation areas. Impose mitigation fees on development of such lands and use funds generated to protect existing, or create replacement, conservation areas.	X	--
GCC-2-30	Provide public education and information about options for reducing greenhouse gas emissions through responsible purchasing, conservation, and recycling.	X	--
Land Use Element			
GCC-2-31	Adopt land use designations to carry out policies designed to reduce greenhouse gas emissions, e.g., policies to minimize or reduce vehicle miles traveled, encourage development near existing public transportation corridors, encourage alternative modes of transportation, and promote infill, mixed use, and higher density development.	X	--
GCC-2-32	Identify and facilitate the development of land uses not already present in local districts – such as supermarkets, parks and recreation fields, and schools in neighborhoods; or residential uses in business districts – to reduce vehicle miles traveled and allow bicycling and walking to these destinations.	X	--
GCC-2-33	Create neighborhood commercial districts.	X	--
GCC-2-34	Require bike lanes and bicycle/pedestrian paths.	X	--
GCC-2-35	Prohibit projects that impede bicycle and walking access, e.g., large parking areas that cannot be crossed by non-motorized vehicles, and new residential communities that block through access on existing or potential bicycle and pedestrian routes.	X	X
GCC-2-36	Site schools to increase the potential for students to walk and bike to school.	N/A	X
GCC-2-37	Enact policies to limit or discourage low-density development that segregates employment, services, and residential areas.	X	X
GCC-2-38	Where there are growth boundaries, adopt policies providing certainty for infill development.	X	X
GCC-2-39	Require best management practices in agriculture and animal operations to reduce emissions, conserve energy and water, and utilize alternative energy sources, including biogas, wind, and solar.	N/A	N/A

ID	Suggested Mitigation Measures	Campus	Community
Circulation Element			
GCC-2-40	In conjunction with measures that encourage public transit, ride sharing, bicycling and walking, implement circulation improvements that reduce vehicle idling. For example, coordinate controlled intersections so that traffic passes more efficiently through congested areas.	F	--
GCC-2-41	Create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling and walking. Before funding transportation improvements that increase vehicle miles traveled, consider alternatives such as increasing public transit or improving bicycle or pedestrian travel routes.	X	X
GCC-2-42	Give funding preference to investment in public transit over investment in infrastructure for private automobile traffic.	X	--
GCC-2-43	Include safe and convenient bicycle and pedestrian access in all transportation improvement projects. Ensure that non-motorized transportation systems are connected and not interrupted by impassable barriers, such as freeways and include amenities such as secure bicycle parking.	X	--
GCC-2-44	Provide adequate and affordable public transportation choices including expanded bus routes and service and other transit choices such as shuttles, light rail, and rail where feasible.	X	--
GCC-2-45	Assess transportation impact fees on new development in order to maintain and increase public transit service.	N/A	--
GCC-2-46	Provide public transit incentives, including free and reduced fare areas.	F	--
GCC-2-47	Adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation. For example, reduce parking for private vehicles while increasing options for alternative transportation; eliminate minimum parking requirements for new buildings; "unbundle" parking (require that parking is paid for separately and is not included in rent for residential or commercial space); and set appropriate pricing for parking.	F	--
GCC-2-48	Develop school transit plans to substantially reduce automobile trips to, and congestion surrounding, schools. (According to some estimates, parents driving their children to school account for 20–25% of the morning commute.) Plans may address, e.g., necessary infrastructure improvements and potential funding sources; replacing older diesel buses with low or zero-emission vehicles; mitigation fees to expand school bus service; and Safe Routes to School programs and other formal efforts to increase walking and biking by students.	N/A	--
GCC-2-49	Create financing programs for the purchase or lease of vehicles used in employer ride sharing programs.	F	--
GCC-2-50	Enter into partnerships to create and expand polluting vehicle buy-back programs to include vehicles with high greenhouse gas emissions.	N/A	--

ID	Suggested Mitigation Measures	Campus	Community
GCC-2-51	Provide public education and information about options for reducing motor vehicle-related greenhouse gas emissions. Include information on trip reduction; trip linking; public transit; biking and walking; vehicle performance and efficiency (e.g., keeping tires inflated); low or zero-emission vehicles; and car and ride sharing.	X	--
Housing Element			
GCC-2-52	Improve the jobs-housing balance and promote a range of affordable housing choices near jobs, services and transit.	X	--
GCC-2-53	Concentrate mixed use, and medium to higher density residential development in areas near jobs, transit routes, schools, shopping areas and recreation.	X	X
GCC-2-54	Increase density in single-family residential areas located near transit routes or commercial areas. For example, promote duplexes in residential areas and increased height limits of multi-unit buildings on main arterial streets, under specified conditions.	N/A	--
GCC-2-55	Encourage transit-oriented developments.	X	X
GCC-2-56	Impose minimum residential densities in areas designated for transit-oriented, mixed-use development to ensure higher density in these areas.	X	X
GCC-2-57	Designate mixed use areas where housing is one of the required uses.	X	X
GCC-2-58	In areas designated for mixed use, adopt incentives for the concurrent development of different land uses (e.g., retail with residential).	N/A	--
GCC-2-59	Promote infill, mixed use, and higher density development by, for example, reducing developer fees; providing fast-track permit processing; reducing processing fees; funding infrastructure loans; and giving preference for infrastructure improvements in these areas.	X	X
Open Space Element			
GCC-2-60	Preserve forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, groundwater recharge areas and other open space that provide carbon sequestration benefits.	X	--
GCC-2-61	Establish a mitigation program for development of those types of open space that provide carbon sequestration benefits. Require like-kind replacement for, or impose mitigation fees on development of such lands. Use funds generated to protect existing, or create replacement, open space.	X	--
GCC-2-62	Allow alternative energy projects in areas zoned for open space where consistent with other uses and values.	X	--
GCC-2-63	Protect existing trees and encourage the planting of new trees. Adopt a tree protection and replacement ordinance, e.g., requiring that trees larger than a specified diameter that are removed to accommodate development must be replaced at a set ratio.	X	--
GCC-2-64	Connect parks and publicly accessible open space through shared pedestrian/bike paths and trails to encourage walking and bicycling.	X	X

ID	Suggested Mitigation Measures	Campus	Community
Safety Element			
GCC-2-65	Address expected effects of climate change that may impact public safety, including increased risk of wildfires, flooding and sea level rise, salt-water intrusion; and health effects of increased heat and ozone, through appropriate policies and programs.	F	--
GCC-2-66	Adopt programs for the purchase, transfer or extinguishment of development rights in high-risk areas.	F	--
GCC-2-67	Monitor the impacts of climate change. Use adaptive management to develop new strategies, and modify existing strategies, to respond to the impacts of climate change.	F	--

Source: Department of Justice, The California Environmental Quality Act – Addressing Global Warming Impacts at the Local Agency Level, *http://ag.ca.gov/globalwarming/pdf/ GW_mitigation_measures.pdf., 2008.*

Table 4.16-11
Office of Planning and Research Suggested Mitigation Measures

ID	Suggested Mitigation Measures	Campus	Community
Land Use and Transportation			
GCC-3-1	Implement land use strategies to encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density development along transit corridors. Encourage compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of public transit systems.	X	X
GCC-3-2	Encourage infill, redevelopment, and higher density development, whether in incorporated or unincorporated settings.	X	X
GCC-3-3	Encourage new developments to integrate housing, civic and retail amenities (jobs, schools, parks, shopping opportunities) to help reduce VMT resulting from discretionary automobile trips.	X	X
GCC-3-4	Apply advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services.	X	X
GCC-3-5	Incorporate features into project design that would accommodate the supply of frequent, reliable and convenient public transit.	X	X
GCC-3-6	Implement street improvements that are designed to relieve pressure on a region's most congested roadways and intersections.	X	X
GCC-3-7	Limit idling time for commercial vehicles, including delivery and construction vehicles.	X	X

ID	Suggested Mitigation Measures	Campus	Community
Urban Forestry			
GCC-3-8	Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling.	X	X
GCC-3-9	Preserve or replace on-site trees (that are removed due to development) as a means of providing carbon storage.	X	--
Green Buildings			
GCC-3-10	Encourage public and private construction of LEED (Leadership in Energy and Environmental Design) certified (or equivalent) buildings.	X	X
Energy Conservation Policies and Actions			
GCC-3-11	Recognize and promote energy saving measures beyond Title 24 requirements for residential and commercial projects.	X	X
GCC-3-12	Where feasible, include in new buildings facilities to support the use of low/zero carbon-fueled vehicles, such as the charging of electric vehicles from green electricity sources.	F	--
GCC-3-13	Educate the public, schools, other jurisdictions, professional associations, business and industry about reducing GHG emissions.	N/A	--
GCC-3-14	Replace traffic lights, streetlights, and other electrical uses to energy efficient bulbs and appliances.	X	--
GCC-3-15	Purchase Energy Star equipment and appliances for public agency use.	X	--
GCC-3-16	Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.	X	--
GCC-3-17	Execute an Energy Savings Performance Contract with a private entity to retrofit public buildings. This type of contract allows the private entity to fund all energy improvements in exchange for a share of the energy savings over a period of time.	F	N/A
GCC-3-18	Design, build, and operate schools that meet the Collaborative for High Performance Schools (CHPS) best practices.	N/A	--
GCC-3-19	Retrofit municipal water and wastewater systems with energy efficient motors, pumps and other equipment, and recover wastewater treatment methane for energy production.	N/A	N/A
GCC-3-20	Convert landfill gas into energy sources for use in fueling vehicles, operating equipment, and heating buildings.	N/A	N/A
GCC-3-21	Purchase government vehicles and buses that use alternatives fuels or technology, such as electric hybrids, biodiesel, and ethanol. Where feasible, require fleet vehicles to be low emission vehicles. Promote the use of these vehicles in the general community.	X	--
GCC-3-22	Offer government incentives to private businesses for developing buildings with energy and water efficient features and recycled materials. The incentives can include expedited plan checks and reduced permit fees.	N/A	--
GCC-3-23	Offer rebates and low-interest loans to residents that make energy-saving improvements on their homes.	N/A	--
GCC-3-24	Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.	X	X

ID	Suggested Mitigation Measures	Campus	Community
Programs to Reduce Vehicle Miles Traveled			
GCC-3-25	Offer government employees financial incentives to carpool, use public transportation, or use other modes of travel for daily commutes.	X	X
GCC-3-26	Encourage large businesses to develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes.	N/A	--
GCC-3-27	Develop shuttle systems around business district parking garages to reduce congestion and create shorter commutes.	X	--
GCC-3-28	Create an online ridesharing program that matches potential carpoolers immediately through email.	F	--
GCC-3-29	Develop a Safe Routes to School program that allows and promotes bicycling and walking to school.	N/A	--
Programs to Reduce Solid Waste			
GCC-3-30	Create incentives to increase recycling and reduce generation of solid waste by residential users.	F	--
GCC-3-31	Implement a Construction and Demolition Waste Recycling Ordinance to reduce the solid waste created by new development.	N/A	--
GCC-3-32	Add residential/commercial food waste collection to existing greenwaste collection programs.	N/A	--

Source: Office of Planning and Research, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, http://opr.ca.gov/download.php?dl=ceqa/pdfs/june08-ceqa.pdf. 2008.

As demonstrated above, the Campus has committed to implementing a comprehensive Climate Action Plan (CAP) and a sustainability program as part of the 2009 LRDP which will reduce its total emissions substantially below "business as usual" emissions by 2020 and beyond. Therefore, the impact from the development of the Campus on global climate would not be significant and no mitigation is required.

Although the University Community is also planned as a sustainable community and is proposed adjacent to the campus specifically to avoid and reduce vehicle emissions associated with travel to and from the campus, the University Community development could nonetheless result in GHG emissions that are not at least 30 percent below "business as usual" emissions. Therefore, the development of the proposed University Community could potentially impede or conflict with the emissions reduction targets and strategies prescribed in or developed to implement AB 32 and could result a contribution to global climate change that would be cumulatively considerable. The following mitigation measure is proposed to reduce the University Community's GHG emissions impact to a less than significant level.

MM GCC-1: The local jurisdiction with land use authority over the University Community should prepare a Climate Action Plan (CAP) as a separate element of the General Plan or as a component of an existing General Plan Component. The CAP should inventory baseline GHG emissions, 1990 GHG emissions, and 2020 GHG emissions. The CAP should also set reduction targets in accordance with AB 32, other state laws, and applicable local or regional enactments addressing GHG emissions. It is anticipated that implementation of the CAP will help the local jurisdiction achieve a reduction in GHG emissions, as compared to a "business as usual" scenario. The local jurisdiction should require development within the University Community to comply with the requirements of the CAP for new development.

Significance after Mitigation: Neither the County nor the City have developed or adopted a CAP at this time, there is no assurance that the GHG emissions associated with the University Community development will be reduced to the required levels. Therefore, the impact is considered significant and unavoidable.

4.16.6.2 Alternative 2 - Yosemite Avenue

The Yosemite Avenue Alternative site is located in the same general area as the Proposed Action for purposes of evaluating air quality impacts. It would consist of the same intensity of development of the Campus and the University Community as Alternative 1. However, it would occur in a slightly different location.

From GHG emissions standpoint, Alternative 2 would generate the same construction and operational emissions as the development would occur under the same assumptions as those described for Alternative 1 (e.g., start construction in mid-2009, full buildout in 2030). Accordingly, the climate change impact would be generally the same as the impact of Alternative 1.

4.16.6.3 Alternative 3 - Bellevue Ranch

The Bellevue Ranch Alternative site is located in the same general area as the Proposed Action for purposes of evaluating air quality impacts. It would consist of the same intensity of development of the Campus and the University Community as Alternative 1. However, it would occur in a different location.

From a GHG emissions standpoint, Alternative 3 would generate the same construction and operational emissions as the development would occur under the same assumptions as those described for Alternative 1 (e.g., start construction in mid-2009, full buildout in 2030). Accordingly, the climate change impact would be generally the same as the impact of Alternative 1.

4.16.6.4 Alternative 4 - 2002 Proposed Project

The site of Alternative 4, identified as the 2002 Proposed Project, is similar to that under Alternative 1, Proposed Action, except that the Campus and the University Community areas are larger than under the Proposed Action.

From a GHG emissions standpoint, Alternative 4 would generate similar construction emissions as Alternative 1; however, the emissions would occur over a longer time period resulting in increased total construction emissions. Alternative 4 would generate somewhat lower operational emissions compared to those described for Alternative 1 because although the residential population size would be the same and building space built under this alternative would be lower. Accordingly, the climate change impact would be comparable or somewhat lesser for Alternative 4 than that of Alternative 1.

4.16.6.5 Alternative 5 - No Action

Under the No Action Alternative, no permits would be issued by the USACE; however, the Phase 1.1 Campus could be built out to service 3,612 students with associated faculty and staff and Community South could be constructed unrelated to the Campus. For purposes of analysis, it is assumed that Community South would consist of the same level of development as the Community South development included in Alternatives 1 and 4: 4,029 single-family residential units; 1,794 multi-family units; 390,000 square feet of retail and commercial space; schools; and parks. Because of the reduced level of development under Alternative 5, the GHG emissions for the Campus and University Community would be much less than Alternative 1, and the impact would be lesser than that of Alternative 1.

4.16.6.6 Alternative 6 - No Build

Under the No Build Alternative, no additional construction would occur on the campus, and the Phase 1.1 Campus would continue at its current enrollment of about 2,009 students and associated faculty and staff. No development of the University Community would take place.

Under Alternative 6, the operational GHG emissions would be much less than Alternative 1 because no additional development would occur. Unlike the other alternatives, Alternative 6 would not add GHG emissions to the California inventory. Thus, Alternative 6 would have a less than significant impact on global climate.

4.16.7 SUMMARY COMPARISON OF ALTERNATIVES

Alternatives 1, 2, and 3 would be identical in terms of their construction and operational GHG emissions and related air quality impacts. Alternative 4 would result in larger total construction emissions and

comparable or somewhat lower operational emissions than Alternative 1 because of the smaller building space included in that alternative. Alternatives 5 and 6 would have lower construction (no impact for Alternative 6) and operational emissions than Alternative 1, and Alternative 6 would have less than significant air quality impacts with respect to its construction and operational GHG emissions as it would not add GHG emissions to the California inventory.

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5.0 CUMULATIVE IMPACTS

5.1 INTRODUCTION

This section of the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) presents the cumulative impacts of the Proposed Action and its alternatives. The discussion of cumulative impacts evaluates whether the cumulative impacts of the Proposed Action or an alternative would be significant when considered in combination with the effects of past, present, and reasonably foreseeable projects, and whether the Proposed Action or an alternative would make a cumulatively considerable contribution to those cumulative impacts that are determined to be significant.

Public and agency comments related to cumulative impacts received in response to the Notice of Intent/Notice of Preparation for this Draft EIS/EIR are summarized below.

- The cumulative effects should be assessed based on the guidance provided by the Council on Environmental Quality (CEQ), the US Environmental Protection Agency (US EPA), California Department of Transportation (Caltrans), and Federal Highway Administration (FHWA).
- The cumulative impact analysis should reflect the current projected growth and land use changes for the City of Merced and Merced County.

Both CEQ guidance and the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* were followed in the evaluation of cumulative impacts below. Although the Proposed Action is not subject to FHWA or Caltrans requirements, because the "Guidance for Preparers of Cumulative Impact Analysis" prepared by the US EPA, FHWA, and Caltrans (Caltrans 2005) provides useful directions for the preparation of cumulative impact assessments, that guidance was used in the preparation of this section of the Draft EIS/EIR.

The cumulative impact analysis below is based on not only the growth reflected in the adopted regional plans but also the projected growth and land use changes that the City has identified in conjunction with its General Plan Update that is in progress. The current growth projections of the County and the City are discussed below.

5.2 CUMULATIVE IMPACT ANALYSIS

Both National Environmental Policy Act (NEPA) regulations and *State CEQA Guidelines* require that cumulative impacts of a proposed action be assessed and disclosed in an EIS/EIR. Although both the laws define the term cumulative impact similarly, the definitions are slightly different.

According to the CEQ, a cumulative impact results from the "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7) Cumulative impacts need to be addressed if the project's impact combined with impacts caused by other projects may be determined to be significant.

CEQA requires that EIRs disclose the cumulative impacts of a proposed project, and that the analysis reflect the severity of the impacts and the likelihood of their occurrence. The cumulative discussion is guided by the standards identified in Section 15355 of the *State CEQA Guidelines*:

> *Cumulative impacts refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.*
>
> *(a) The individual effects may be changes resulting from a single project or a number of separate projects;*
>
> *(b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future project. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

Furthermore, Section 15130(a) of the *State CEQA Guidelines* states that a "cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." Section 15130 of the *State CEQA Guidelines* provides direction regarding cumulative impact analysis as follows:

- An EIR should not discuss cumulative impacts that do not result, in part, from the proposed project;
- A lead agency may determine that an identified cumulative impact is less than significant, and shall briefly identify facts and analysis in the EIR supporting its determination;
- A lead agency may determine a project's incremental effect is not cumulatively considerable and, therefore, is not significant and shall briefly describe in the EIR the basis of its determination; and
- A lead agency may determine a project's cumulatively considerable contribution to a significant cumulative impact may be rendered less than cumulatively considerable and, therefore, residually not significant, if the project implements or funds its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.

5.2.1 Approach to Cumulative Impact Analysis

The *Guidance for Preparers of Cumulative Impact Analysis* (Caltrans 2005) recommends the use of an eight-step approach in developing a cumulative impact analysis. These eight steps include the following: (1) identify resources to consider in the cumulative impact analysis; (2) define study area for each resource; (3) describe the current health and historical context for each resource; (4) identify the direct and indirect impacts of the proposed project that might contribute to a cumulative impact; (5) identify other reasonably foreseeable actions that affect each resource; (6) assess potential cumulative impacts; (7) report the results; and (8) assess the need for mitigation. These steps were followed in preparing the cumulative impact assessment for this Draft EIS/EIR as described below. Those areas where the analysis deviated from the Caltrans guidance are also identified below.

Identification of Resources

Based on direction provided by the United States Army Corps of Engineers (USACE), the federal lead agency, and the University of California, the state lead agency for the Proposed Action, the CEQA checklist (Note that global climate change is not on the CEQA checklist as a resource topic. However, the Proposed Action's contribution to the global cumulative impact is addressed in **Section 4.16**.)was used to identify resource topics that would be considered in the cumulative impact analysis. Note that this approach ensures that all resource topics are covered. No scoping comments were received that identified specific resources that should be considered in the cumulative impact analysis.

Definition of Study Area

For each resource to be addressed, the study area was defined based on the nature and characteristics of the resource. For instance, aesthetic impacts would be expected to occur mainly in the area to the northeast of the City of Merced. Therefore, the immediate vicinity of the Proposed Action, primarily the viewsheds from Lake and Bellevue Roads, was defined as the study area for cumulative visual impacts. The cumulative impacts from the additional air emissions of reactive organic gases and nitrogen oxides on the other hand would be regional in nature and therefore the study area for most of the cumulative air quality impacts is the entire San Joaquin Valley Air Basin. The study areas are defined in the discussion of each of the cumulative impacts below.

Description of the Status of the Resource

For each resource to be addressed, the current health and historical context was described based on the best available information. The information was drawn from **Section 4.0** of this Draft EIS/EIR, supplemented with additional data as necessary.

Identification of Direct and Indirect Impacts of the Proposed Action

Those direct and indirect impacts of the Proposed Action that had a potential to contribute to a cumulative impact were described based on the analysis contained in **Section 4.0** of this Draft EIS/EIR.

Identification of Other Current and Reasonably Foreseeable Future Actions/Projects

State CEQA Guidelines provide guidance as to how other current and reasonably foreseeable future actions may be identified for purposes of a cumulative impact analysis. Section 15130(b) of the guidelines presents two alternate approaches for considering present and reasonably foreseeable projects. Either of the following approaches may be used:

- A list of past, present, and reasonably foreseeable projects; or
- A summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which describe or evaluated regional or areawide conditions contributing to cumulative impacts.

As explained in more detail below, the plan-based approach was used in this Draft EIS/EIR to evaluate cumulative impacts. One related project, the Campus Parkway project, is currently approved and planned in the immediate vicinity of the proposed project site. That project is considered throughout the analysis as a foreseeable project. It should be noted that although other land use changes are projected for the vicinity of the Proposed Action, no specific project is currently proposed in this area. Therefore, for purposes of this cumulative impact analysis, the Campus Parkway project is the only related project that was specifically considered in the analysis. The Campus Parkway project involves the construction of a new four-lane expressway on the east side of the City of Merced that would extend from SR 99 north up to Yosemite Avenue. North of that point, the segment of this parkway between Yosemite Avenue and Bellevue Road would lie within the site of the Proposed Action and has been incorporated into the proposed revised plans for the Campus and Community North. Analysis of this related project is consistent with the first method identified in *State CEQA Guidelines* Section 15130(b) for the consideration of reasonably foreseeable projects.

Because the development of the Campus and the University Community would occur over a long period of time, the plan-based approach was used to identify other foreseeable development in the area of the Proposed Action. The analysis of cumulative impacts was completed based on the Merced County General Plan, the City of Merced Vision 2015 General Plan, which is the currently adopted general plan for the City of Merced, and the growth projections provided by the Merced County Association of Governments (MCAG). Note that the City of Merced and the County of Merced General Plans are currently being updated. Because a substantial amount of growth is projected in the City of Merced

General Plan Update that is currently underway, even though that plan has not yet been finalized nor adopted, the preliminary estimates of growth projected in the update are also included in this cumulative impact analysis. This plan-based approach is consistent with the second method identified in *State CEQA Guidelines* Section 15130(b) for the consideration of reasonably foreseeable projects. Each of these plans/projections used in developing the cumulative impact analysis is briefly described below.

County of Merced General Plan

The Merced County Year 2000 General Plan (Merced County General Plan) was adopted in 1989 by the Merced County Board of Supervisors. The Merced County General Plan outlines the County's goals and desires concerning land use and is organized into seven chapters. The County of Merced is currently in the process of updating its General Plan. However, the County General Plan Update will not substantially alter land use in and around the City of Merced since it will mainly focus on broader policy initiatives rather than the establishment of new urban districts that would guide growth (Smith 2008). For this reason, the cumulative impacts of the Proposed Action are evaluated in conjunction with growth based on the currently adopted County of Merced General Plan.

City of Merced General Plan

The City of Merced Vision 2015 General Plan (2015 General Plan) was adopted in April 1997 by the Merced City Council. The 2015 General Plan serves as a blueprint for growth and development in the City of Merced and is organized into 11 chapters that address the major issues affecting the future growth of the City. The 2015 General Plan Land Use Map identifies several boundaries within the Plan Area, including the City limits, Area of Influence, Sphere of Influence (SOI), as well as a designated UC Planning Area. The UC Planning Area generally extends from Lake Yosemite on the north to Yosemite Avenue on the south and is bounded by Lake Road on the west. The UC Merced Planning Area is outside the City limits; the northern portion of the site is within the City's SOI, while the southern portion is outside the SOI.

The City of Merced is currently in the process of updating its General Plan (General Plan Update). This process is expected to take approximately 2.5 years or until the end of 2008 or early 2009. As part of the Plan Update and as indicated on the draft Plan Update Land Use Map (**Figure 5.0-1, Draft City of Merced General Plan Land Use Diagram),** the City's SOI would be expanded to include the entire Proposed Action site, which would be designated for a mixture of residential, commercial, and open space uses. The area immediately west of the Proposed Action site on either side of Bellevue Road would no longer be exclusively designated for Rural Residential uses, but would also be designated by the

Merced City for Low to High Density Residential, Village Residential, Business Park and Open Space–Park Recreation uses.

The General Plan Update will cover the planning period from 2009 to the year 2030, and will guide the growth and development of the new Plan Area. The General Plan Update will retain a majority of the 2015 General Plan goals, objectives and policies with minor revisions. Expansion of the urban land use designations, especially in the northeast portion of the new Plan Area, will require the limits of existing City services and infrastructure to be expanded to accommodate new development anticipated within the 20-year time frame of the General Plan Update. Other policies in the General Plan Update will limit leap-frog development and provide for an orderly transition from rural to urban land uses. Furthermore, one of the proposed planning principles includes connectivity between existing urban areas and those planned in and around the UC Merced Campus and University Community. As discussed above, the General Plan Update would modify the General Plan Land Use Map to reflect the expansion of urban land use designations.

At buildout of the updated General Plan, the Plan Area would contain 69,704 single-family units and 25,985 multifamily units. Based on occupancy rates of 3.02 persons per household for single-family units and 2.7 persons per household for multifamily units, the total residential population within the Plan Area at buildout would be 280,666 residents, including 36,000 residents within the Campus and University Community. Additionally, total employment within the plan area at buildout would be 40,514 employees (Abramson 2008).

Although all of the growth envisioned under the City's General Plan Update is pertinent to this evaluation of cumulative impacts, the current proposal for the designation of lands on either side of Bellevue Road (Bellevue corridor) for high density development as part of the General Plan Update is particularly important to the cumulative impact evaluation as the Bellevue corridor development along with the development of the Campus and University Community would substantially change this portion of the City and County.

Merced County Association of Governments

MCAG is a regional planning organization for multijurisdictional issues such as transportation, solid waste and housing. Members include Merced County and the six incorporated cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced. MCAG prepares the Regional Transportation Plan (RTP), which specifies the policies, projects, and programs necessary over a period of twenty or more years to maintain, manage, and improve the region's transportation systems. The current RTP covers the period 2007 to 2030. MCAG also prepares and maintains population and employment forecasts for use in

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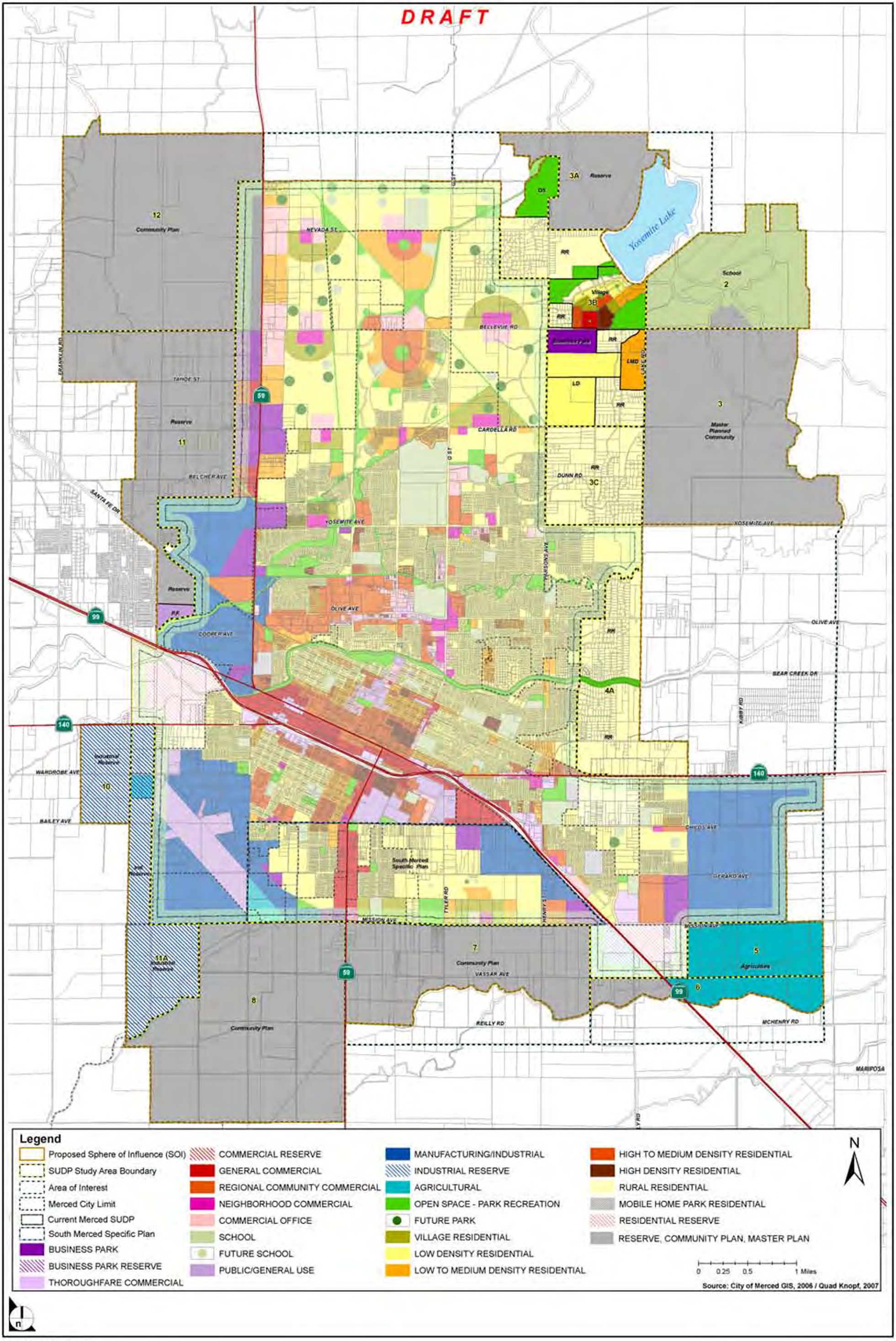

Legend

- Proposed Sphere of Influence (SOI)
- SUDP Study Area Boundary
- Area of Interest
- Merced City Limit
- Current Merced SUDP
- South Merced Specific Plan
- BUSINESS PARK
- BUSINESS PARK RESERVE
- THOROUGHFARE COMMERCIAL
- COMMERCIAL RESERVE
- GENERAL COMMERCIAL
- REGIONAL COMMUNITY COMMERCIAL
- NEIGHBORHOOD COMMERCIAL
- COMMERCIAL OFFICE
- SCHOOL
- FUTURE SCHOOL
- PUBLIC/GENERAL USE
- MANUFACTURING/INDUSTRIAL
- INDUSTRIAL RESERVE
- AGRICULTURAL
- OPEN SPACE - PARK RECREATION
- FUTURE PARK
- VILLAGE RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- LOW TO MEDIUM DENSITY RESIDENTIAL
- HIGH TO MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- RURAL RESIDENTIAL
- MOBILE HOME PARK RESIDENTIAL
- RESIDENTIAL RESERVE
- RESERVE, COMMUNITY PLAN, MASTER PLAN

N

0 0.25 0.5 1 Miles

Source: City of Merced GIS, 2006 / Quad Knopf, 2007

SOURCE: Quad Knopf 2007

FIGURE **5.0-1**

Draft City of Merced General Plan Land Use Diagram

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regional planning. The population and employment forecasts reflect the growth that is anticipated to occur during the current planning period within Merced County and its cities and communities. These forecasts were last updated in March 2004. They are consistent with the Department of Finance countywide projections, with the addition of growth related to development of UC Merced, and are based on each jurisdiction's adopted General Plan, updated through 2004. By 2030, according to MCAG projections, the population of the City of Merced is projected to be 116,800 residents and the population of the County of Merced is projected to be 417,200 residents (MCAG 2007).

As can be seen by comparing these projections to the City of Merced's current (although not adopted) projections for 2030, MCAG projections do not reflect the amount of residential population growth that is now projected by the City of Merced. To address this discrepancy, where cumulative impacts were evaluated based on MCAG data, a supplemental analysis using the City's updated projections was also completed.

Also note that in addition to the use of MCAG projections supplemented by an analysis of growth under the City of Merced General Plan Update, with respect to the specific resource topic of transportation and traffic, major roadway improvement projects (such as the Atwater Expressway as well as other approved and funded improvements) were closely examined and those improvement projects that were reasonably certain to be implemented were considered in the cumulative analysis.

Evaluation of Potential Cumulative Impacts, Presentation of Results, and Necessary Mitigation Measures

For each resource topic, potential cumulative impacts were evaluated either qualitatively or based on quantitative information where available.

For each cumulative impact, as a first step it was determined whether the Proposed Action in conjunction with other past, current and reasonably foreseeable development, would result in a cumulative impact, and if so, whether the cumulative impact be significant. Note that similar to the approach taken in **Section 4.0**, the severity of impacts under both NEPA and CEQA is expressed in this section using the CEQA terminology of significant or less than significant cumulative impacts (it is acknowledged that NEPA does not require a description of the severity of a cumulative impact for most resources where specific criteria are not available). For each resource topic, the cumulative impact's significance pre and post mitigation is reported in parentheses.

For those cumulative impacts that were determined to be significant, the Proposed Action's contribution to the cumulative impact was evaluated to determine whether the contribution would be "cumulatively

considerable." Cumulatively considerable is a CEQA term that describes the importance of the proposed project's contribution to the overall cumulative impact.

As a last step, for those cumulative impacts that were determined to be significant, mitigation measures were identified to be implemented by either the project proponents or other entities that have control over future land development that would result in the significant cumulative impacts, or both.

5.3 CUMULATIVE IMPACTS OF THE PROPOSED ACTION AND ITS ALTERNATIVES

Cumulative impacts of the Proposed Action and its alternatives are presented below by environmental resource topic. The impact discussions correspond to the categories of impacts that are discussed in detail in **Section 4.0** for the Proposed Action and the alternatives. The significance criteria that were used to evaluate project impacts in **Section 4.0** were also used to evaluate cumulative impacts.

Under each cumulative impact, the cumulative impact of the Proposed Action is first discussed. In instances where the Proposed Action's contribution to the cumulative impact is determined to be cumulatively considerable, the text identifies whether the development of both the Campus and the University Community or just one of those two areas would make that cumulatively considerable contribution. The discussion of the Proposed Action's cumulative impact is followed by a summary discussion identifying whether the cumulative impacts of the alternatives would be the same, greater, or lesser than those of the Proposed Action. As appropriate, mitigation measures are identified for significant cumulative impacts.

5.3.1 Aesthetics

Cumulative Impact AES-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in a change in visual quality and character, loss of scenic vistas, and generation of light and glare. (*Significant; Significant and Unavoidable*)**

The study area for potential cumulative aesthetics impacts is the area around the campus to the northeast of the City of Merced along Lake Road and Bellevue Road.

As described in **Section 4.1, Aesthetics**, with the exception of the Phase 1 Campus area which is developed with campus facilities, lands within the campus site are undeveloped land that are either annual grasses or under-irrigated pasture. The University Community site is rural in character, appearing

as a large, mostly flat expansive open area with just a few farm-related structures located in the south central portion of the site. Lands surrounding the campus and University Community also appear as expansive open undulating to flat lands that are largely undeveloped with some scattered rural residences along Bellevue Road and Lake Road. The undeveloped lands surrounding the proposed project site are annual grasslands typical of the San Joaquin Valley. Cultivated farmlands are present to the south and southeast of the site.

Alternative 1, Proposed Action

Cumulative Effect on Visual Character

Development of the Campus and University Community in combination with the Campus Parkway project and the development of the Bellevue corridor would significantly change the visual character of the project vicinity. The change from a largely undeveloped rural setting to a developed urbanized setting could be perceived by area residents, visitors to Lake Yosemite Regional Park, and motorists using area roadways as an adverse change in visual character. Accordingly, the cumulative change in the visual character and quality of the area is considered a significant cumulative impact. The Proposed Action's contribution (both the Campus and University Community) to this cumulative impact would be cumulatively considerable.

Cumulative Impact on Scenic Vistas

As discussed in **Section 4.1,** development of the Campus and University Community would interrupt view corridors that currently provide views of the Sierra Nevada from Lake Road and Yosemite Avenue. The Proposed Action would also develop the open rangeland and cropland that are contributing elements of the scenic vistas. Furthermore, the development of the University Community would alter currently available scenic views from adjacent rural residences along Lake Road. Except at crossings over Bear Creek and Highway 140, the Campus Parkway project is expected to be at grade and would not substantially alter views of the surrounding areas. Development of the Bellevue corridor is likely to interrupt view corridors and alter scenic views currently available to persons traveling along Bellevue Road. Although mitigation is proposed to reduce the Proposed Action's impact on scenic vistas, the cumulative loss of views due to development of the Campus, University Community, and other development along Bellevue Road would result in a significant cumulative impact. The Proposed Action's contribution (both the Campus and University Community) to this cumulative impact would be cumulatively considerable.

Cumulative Impact on Scenic Resources

As discussed in **Section 4.1**, neither the Proposed Action nor the alternatives are not located near any state-designated scenic highways and there are no resources present on the sites that would qualify as scenic resources. Since the sites of the Campus, University Community, Campus Parkway, and Bellevue corridor development do not contain unique scenic resources, the cumulative projects would not result in a significant cumulative impact on scenic resources.

Cumulative Impact Related to Light and Glare

Development of the Campus, University Community, Campus Parkway, and Bellevue corridor would result in new sources of light and glare within the study area. Exterior and interior lighting associated with buildings, parking lots, and recreational facilities, combined with illumination of roadways and walkways, would add significant sources of nighttime illumination and potential sources of glare to an area that is currently largely undeveloped and not heavily illuminated at night. Mitigation measures proposed for both the Campus and University Community would reduce the potential for light spillover and skyglow. However, the increase in nighttime illumination as a result of cumulative development would result in a significant cumulative impact. The Proposed Action's contribution (both the Campus and University Community) to this cumulative impact would be cumulatively considerable.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, Alternatives 2, 4, and 5, like the Proposed Action, would substantially alter the visual quality and character of the project area. No scenic resources are located within the alternatives sites, but development at the alternatives sites would contribute to the cumulative loss of scenic views, especially those of the Sierra Nevada Range. The Alternative 3 site, the Bellevue Ranch area, is in northern Merced and does not offer views of the Sierra Nevada range as prominently as the Proposed Action area. Also similar to the Proposed Action, Alternatives 2 through 5 would contribute to significant cumulative light and glare impacts. Alternative 6, the No Build Alternative, would not contribute to any cumulative aesthetic impact. Therefore, with the exception of Alternative 6, which would not contribute to cumulative aesthetic impacts, and Alternative 5, which would result in somewhat reduced cumulative impacts, all alternatives would result in similar cumulative aesthetic impacts as the Proposed Action.

Cumulative MM AES-1: The City and the County should continue to review all future development proposed within the study area to ensure that new development does not include excessive amounts of new exterior lighting that would increase skyglow.

The Proposed Action includes mitigation measures (**Mitigation Measures AES-1a, -1b, -3, and -4**) to reduce its contribution to the significant cumulative impacts described above but the contribution would not be reduced to be cumulatively not considerable. Additional mitigation measures are not available to reduce cumulative aesthetic impacts to a less than significant level.

Significance after Mitigation: Significant and unavoidable

5.3.2 Agricultural Resources

Section 4.2, Agricultural Resources, presents the direct and indirect impacts of the Proposed Action on agricultural resources. Impact AG-1 addresses the direct loss of Important Farmland as a result of the implementation of the Proposed Action. Because that impact has the potential to cumulate with losses of farmland as a result of past, present and reasonably foreseeable future development, it is evaluated in detail in Cumulative Impact AG-1 below. As discussed in Impact AG-2, the Proposed Action would not substantially conflict with existing zoning for agriculture or involve other changes that could indirectly result in the conversion of Important Farmland, Because there is no potential for that impact to cumulate, it is not discussed further in the cumulative discussion below.

Cumulative Impact AG-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would involve the conversion of undeveloped land to urban uses, resulting in the loss of Important Farmland. (*Significant; Significant and Unavoidable*)**

The study area for potential cumulative impacts on Important Farmland (including prime farmland) is all of Merced County.

As discussed in **Section 4.2,** Merced County is one of the most agriculturally productive counties in California. In terms of total value of agricultural commodities, Merced County ranks as the fifth highest in the state. The majority of agricultural activities in the County are related to livestock and poultry production and the products associated with them. Field crops include cotton, alfalfa, silage, oats, hay, and sugar beets. Vegetable crops include tomatoes, and sweet potatoes. Fruit and nut crops grown in the County include apricots, grapes, peaches, pistachios, peaches, plums, kiwi, strawberries, walnuts, and almonds. Milk is Merced County's leading commodity, followed by poultry and almonds.

Based on Farmland Mapping and Monitoring Program (FMMP) data, the total amount of agricultural land within the County declined approximately 1 percent during the 14-year period from 1992 to 2006. During this time, about 16,800 acres of Prime Farmland and about 8,500 acres of Farmland of Statewide

Importance were converted to other uses. During the same period, the total amount of Unique Farmland and Farmland of Local Importance increased by about 9,300 and 7,100 acres respectively. Overall, approximately 20,945 acres of farmland were converted, with about half of this acreage involving grazing lands. The annual rate of farmland conversion during this period was about 1,500 acres each year.

Alternative 1, Proposed Action

As discussed in **Section 4.2**, development of the Proposed Action would result in a loss of approximately 609 acres of Prime Farmland (under NEPA) and 1,152 acres of Important Farmland (under CEQA), which represents approximately 0.2 percent of Important Farmland in Merced County. Additionally, development of the Campus Parkway would result in the conversion of approximately 170 to 179 acres of Important Farmland. Furthermore, buildout of the currently adopted City of Merced General Plan and the proposed Update would result in the cumulative loss of Important Farmland. Based on the City of Merced GIS data, there are approximately 13,229 acres of Important Farmland within the proposed revised SUDP boundary for the City (City of Merced 2007). Therefore, the cumulative impact to agricultural resources in Merced County would be significant. Although mitigation would reduce the Proposed Action's impact, because it would not replace the lost farmland acreage, the Proposed Action's contribution (University Community only) to this significant cumulative impact even after mitigation would be cumulatively considerable.

Alternatives 2 through 6

Although the acreage of agricultural land converted to urban uses varies under each alternative, Alternatives 2, 3, 4, and 5, like the Proposed Action, would result in the loss of Important Farmland. Although mitigation measures similar to those for the Proposed Action would partially reduce the impact of each alternative, the contribution to the cumulative loss of Important Farmland would be cumulatively considerable for each alternative.

Alternative 6, the No Build Alternative, would not result in the removal of any agricultural land and therefore, would not contribute to the cumulative loss of Important Farmland.

Cumulative MM AG-1: The City and the County should continue to implement policies to control the conversion of farmland within Merced County.

Additional mitigation measures are not available to reduce cumulative impacts on agricultural resources to a less than significant level. The Proposed Action would reduce its contribution to the significant cumulative impact but the contribution would not be reduced to be cumulatively not considerable.

Significance after Mitigation: Significant and unavoidable

5.3.3 Air Quality

Section 4.3, Air Quality, presents the direct and indirect impacts of the Proposed Action on air quality, including impacts from construction and operational emissions, carbon monoxide hot spots, and odors. A project's impacts on air quality are essentially cumulative in nature. Consequently, the analysis of impacts in **Section 4.3** reflects an analysis of the Proposed Action's contribution to a cumulative condition. The discussion under Cumulative Impact AQ-1 below summarizes from the analysis in **Section 4.3**.

Cumulative Impact AQ-1: **The construction and operation of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could hinder air quality attainment and maintenance efforts for criteria pollutants. (*Significant; Significant and Unavoidable*)**

For air pollutants such as carbon monoxide (CO) that result in impacts that are highly localized, the study area is focused on the roadways and intersections that would be used by the project-related traffic. For pollutants that are regional in nature, the study area for potential cumulative air quality impacts is the San Joaquin Valley Air Basin (SJVAB). The SJVAB, which is approximately 250 miles long and averages 80 miles wide, is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada to the east (8,000 to 14,000 feet in elevation), the Coast Range to the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains to the south (6,000 to 8,000 feet in elevation). The valley opens to the sea at the Carquinez Strait where the San Joaquin–Sacramento Delta (Delta) empties into San Francisco Bay. Due to its topography and location relative to other air basins, the airflow in the valley becomes vertically blocked by high barometric pressure over the SJVAB and as a result, the majority of the SJVAB is highly susceptible to pollutant accumulation over time.

As described in **Section 4.3**, the SJVAB is in nonattainment for the federal standards for ozone (8 hour), particulate matter 10 microns or less in diameter (PM_{10}) and particulate matter 2.5 microns or less in diameter ($PM_{2.5}$). The air basin is in nonattainment for the state standards of ozone (1 hour), ozone (8 hour), PM_{10}, and $PM_{2.5}$. Similar to the overall air basin, the monitoring stations in the City of Merced have registered concentrations above state and federal standards for ozone, the state standard for PM_{10}, and the federal standard for $PM_{2.5}$.

Alternative 1, Proposed Action

Cumulative Construction Impacts

As described in **Section 4.3,** during construction of the Proposed Action, the San Joaquin Valley Air Pollution Control District (SJVAPCD) significance thresholds would be exceeded for reactive organic gases (ROG) (from 2010 to 2016 and 2021 to 2030), nitrogen oxides (NO_X) (from 2010 to 2030), and PM_{10} (from 2010 to 2029). Construction-related air quality impacts of the Proposed Action would remain significant after mitigation for ROG and NO_X. Additionally, construction of the Campus Parkway project and other development within the City of Merced would result in emissions of criteria pollutants that could potentially overlap with construction of the Proposed Action. Therefore, cumulative construction impacts to air quality would be significant, and the Proposed Action's contribution (both the Campus and University Community) to the impact would be cumulatively considerable.

Cumulative Traffic and Other Emission Source Impacts

Additionally, the Proposed Action would generate annual operational emissions (comprising emissions from project-related traffic, area sources, and stationary sources) that would exceed the SJVAPCD significance thresholds for ROG, NO_X, and PM_{10} after mitigation. The Campus Parkway project would not directly generate vehicle trips, but would redistribute regional traffic patterns and therefore could increase vehicle emissions in the project area. Other development under the City's current General Plan and proposed General Plan Update would also result in new vehicle trips that would increase vehicle emissions in the air basin. Therefore, cumulative operational impacts to air quality would be significant and the Proposed Action's contribution (both the Campus and University Community) to the impact would be cumulatively considerable.

No significant CO hotspot impacts would affect sensitive receptors in the vicinity of the study intersections as a result of the Proposed Action. Additionally, emissions generated by the Campus Parkway project would not violate CO standards. The CO hot spot analysis in **Section 4.3** takes into account not only the traffic associated with the Proposed Action but also all the existing and future traffic in the City of Merced as a result of the projected growth. Based on that analysis, cumulative CO hotspot impacts would be less than significant.

Please also refer to **Section 4.3**, for a discussion of cumulative air quality impacts as addressed by the regional air quality plans prepared by the SJVAPCD.

Alternatives 2 through 6

Construction and operational emissions associated with Alternatives 2, 3, 4, and 5 would also exceed SJVAPCD significance thresholds and the air quality impacts would generally be the same as those for Alternative 1. Therefore, cumulative air quality impacts of the alternatives along with other regional development would also significant and each alternative's contribution to the cumulative impact would be cumulatively considerable.

Alternative 6, the No Build Alternative, would not result in new air emissions and therefore would not contribute to a significant cumulative impact on air quality.

Cumulative MM AQ-1: The City and the County should continue to review each development project to ensure that all feasible mitigation measures are incorporated into the development project to minimize the new air emissions resulting from the project.

Additional mitigation measures are not available to reduce cumulative air quality impacts to a less than significant level. The Proposed Action includes mitigation measures (**Mitigation Measures AQ-1** and **AQ-2**) to reduce its contribution to the significant cumulative impact but the contribution would not be reduced to be cumulatively less than considerable.

Significance after Mitigation: Significant and unavoidable

5.3.4 Biological Resources

Section 4.4, Biological Resources, presents the Proposed Action's direct and indirect impacts on biological resources at the project site and in its vicinity. The analysis addresses the Proposed Action's impact on wetlands, other sensitive natural communities, special status plant and wildlife species, and wildlife corridors. That analysis found that there would be no impacts arising from conflicts with local ordinances and a habitat conservation plan (HCP) or natural community conservation plan (NCCP). The analysis of cumulative impacts below therefore addresses the Proposed Action's contribution to cumulative impacts associated with the loss of wetlands and habitat for special status plant and wildlife species, including movement corridors.

Cumulative Impact BIO-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in the loss or**

adverse modification of vernal pool wetlands, clay slope wetlands, and other seasonal wetlands. (*Less than Significant*)

The study area for a potential cumulative impact on wetlands is eastern Merced County. Eastern Merced County is generally defined as the area bound by Highway 99 to the west, Stanislaus County to the north, Mariposa County to the east, and Madera County to the south. This area comprises about 365,450 acres, of which about 149,000 are grazing lands; about 177,000 acres are cropland, orchard lands, and lands under other agricultural uses; about 15,000 acres are under urban and residential uses; and the balance under other uses (government lands, utilities, vacant land, etc.) (US Fish and Wildlife Service [USFWS] 2005). Eastern Merced County was defined as the study area for cumulative impacts because this portion of the County contains resources similar to those that would be affected by the Proposed Action.

In terms of the habitats present within the study area, annual grasslands are the predominant natural habitat occurring over vast tracts of land in the eastern portion of the study area. These grasslands in eastern Merced County are used as rangeland. Although largely undisturbed, these grasslands are not a native plant community but are dominated by introduced grass species. However, native herbs and grasses do occur within the grassland areas. A variety of vernal pool wetlands are interspersed in a complex web throughout the grassland habitat, especially in areas with mima mound topography and on low gradient terraces. The types of vernal wetlands that occur in the area include vernal pools, playa pools, and vernal swales. This grassland-vernal pool landscape is the largest remaining block of pristine unfragmented vernal pool habitat in California (USFWS 2005).

Freshwater marsh and riparian habitats are more limited in their distribution in the study area, and are associated with creeks and streams and leaking irrigation canals. Much of the natural habitat, including grassland-vernal pool landscape, has been removed in the western portion of the study area as a result of agricultural activity and urban development. At this time, agricultural lands dominate the landscape in the eastern part of the study area and consist of field and row crops as well as orchards, dairies and other agricultural uses. Agricultural lands under field and row crops do provide foraging habitat for some native wildlife species.

Substantial amount of wetland acreage in eastern Merced County has already been filled in conjunction with past development. In addition to direct losses by filling of vernal wetlands, other adverse changes to vernal pool habitat have resulted from fragmentation of the habitat and alteration of hydrology. Beginning around the mid-1800s, the primary threat to vernal pool habitat was conversion to agriculture and water conveyance projects. Holland estimated that about 32,000 acres in the San Joaquin Valley area had been lost due to agricultural conversions by 1997 and that nearly three-quarters of the vernal pool habitat in the Central Valley had been lost by 1997 (USFWS 2005). Additional losses have occurred since

then as a result of agricultural conversions, urbanization, and mining. Substantial population growth is projected for the Central Valley which is expected to result in additional losses of vernal pool habitat. According to USFWS, because more than 73 percent of the land in the Central Valley is privately owned and only 6 percent of the land containing vernal pool habitat is publicly owned, the threat to vernal pool habitat in the Central Valley is particularly high (USFWS 2005).

With its focus of protecting 33 species associated with vernal pools in California and Southern Oregon, the USFWS has developed the "Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon" which involves an ecosystem-level strategy for recovery and conservation because all 33 species co-occur in the same natural ecosystem and are threatened by the same human activities (USFWS 2005). Implementation of the recovery plan would protect both the vernal wetlands in the state as well as the plant and wildlife species that occur within the vernal pool habitats.

Alternative 1, Proposed Action

As discussed in **Section 4.4, Biological Resources**, development of the Campus and University Community would result in the loss of 85.05 acres of wetlands, including 17.51 acres of vernal pools, 25.19 acres of swale wetlands, 0.33 acre of clay slope wetlands, 12.24 acres of irrigation wetlands, 28.75 acres of canal wetlands, and 1.03 acres of intermittent channels. In addition, the Campus Parkway project is expected to result in the loss of approximately 0.24 acre of seasonal marsh and temporary impacts to approximately 0.41 acre of riparian and forest scrub. Other development in eastern Merced County under the City of Merced adopted General Plan and General Plan Update currently under development would also result in additional temporary and permanent impacts on the types of wetlands listed above as these resources occur in the northern portions of the City's proposed SOI. The acres of wetlands that would be filled cannot be determined until detailed surveys of all affected lands are conducted. However, based on the City of Merced GIS data, there are approximately 862 acres of land within the proposed revised SUDP for the City with lower density vernal pools and 1,861 acres of land with high-density vernal pools (City of Merced 2007).

All new development would be subject to the regulatory and permitting requirements imposed by the USACE, the US Fish and Wildlife Service, the State Department of Fish and Game, and the Regional Water Quality Control Board. Projects subject to these requirements must demonstrate that mitigation for loss of wetland habitats would result in no net loss of wetland function and values and that mitigation would be sufficient to ensure that adverse impacts would not occur to special status species that might be affected by filling of wetland habitat. Because all development projects would comply with the no net loss policy and to the extent, there are small losses of wetlands that fall under nationwide permits and are not compensated by replacement wetlands, such small losses would not represent a substantial

cumulative loss of wetlands. Therefore, on a cumulative basis, the impact on wetlands would normally be expected to be less than significant. However, as noted above, a substantial amount of wetland acreage in eastern Merced County has already been filled in conjunction with past development, including the loss of some wetland acreage as a result of unregulated or unpermitted fill. In addition, there could be some filling of wetlands in the future that falls outside the purview of the federal permitting requirements, or is undertaken without required federal permits, and therefore the loss of those wetlands may not be fully compensated. Lastly, there potentially could be some unique wetlands that could be lost due to development where the acreage lost could be compensated by replacement wetlands but the wetland functions would not be fully replaced. Based on the historical losses of wetlands and the potential that some future losses may not fully mitigated by creation/restoration of wetlands, it is concluded that the cumulative impact on wetlands within the study area would be significant.

However, the Proposed Action would compensate for the loss of wetland habitat through a combination of conservation, restoration and creation. For naturally occurring wetlands (vernal pools, vernal swales and clay slope wetlands) approximately 2,316 acres (1,058 acres on Tier 1 Lands and 1,268 acres on Tier 2 Lands) would be preserved and managed as compared to 40.41 acres directly impacted. This yields a ratio of preserved and managed to impacted acreage of approximately 57:1. When viewed in terms of functional replacement, the increased wetland function resulting from preservation and management would yield an estimated increase of 203.2 functional capacity units as compared to the estimated direct and indirect impact of 28.8 functional capacity units, an approximate ratio of 7:1. Naturally occurring wetlands would also be restored at a 1:1 ratio, and non-naturally occurring wetlands (canal wetlands and irrigation wetlands) would be created at a 1:1 ratio. Note that substantially lower mitigation ratios are considered by the resource agencies as adequate to result in no net loss of wetlands. The high ratios that would be achieved by the Proposed Action demonstrate that the Proposed Action's contribution to the significant cumulative impact would not be cumulatively considerable.

Alternatives 2 through 6

Although the acreage of wetland habitat removed under each alternative varies, Alternatives 2, 3, and 4, like the Proposed Action, would result in the loss of similar types of wetlands and thereby contribute to a regional cumulative impact. However, mitigation measures similar to those for the Proposed Action would reduce the significant impact of Alternatives 2 and 3 and the contribution of these alternatives to the cumulative loss of wetlands would not be cumulatively considerable. As discussed in **Section 4.4,** the impact to wetlands under Alternative 4 would be significant and its contribution would be cumulatively considerable.

Alternative 5, the No Action Alternative, would not result in filling of any wetland on the project site, and Alternative 6, the No Build Alternative, would also avoid filling of wetlands because no development would occur at all on the project site. Both alternatives would not contribute to the significant cumulative impact.

Mitigation Measure: No mitigation is required.

Cumulative Impact BIO-2: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in the loss or adverse modification of important special status plant and wildlife habitat, including adverse effects to special status plant and wildlife species that occupy or could potentially occupy these habitats. (*Less than Significant*)**

The study area for potential cumulative impacts on special status plant and wildlife species and their habitat is eastern Merced County. This study area is defined above under **Cumulative Impact BIO-1**. The habitats present within the study area and their current status are also described above.

Alternative 1, Proposed Action

As described in **Section 4.4, Biological Resources**, the Proposed Action would result in the reduction in numbers of individuals and a loss of occupied habitat of three special status plant species (succulent owl's clover, dwarf downingia, and shining navarretia) associated with vernal pools. The Proposed Action would also result in a direct and indirect impact on occupied vernal pool fairy shrimp habitat and vernal pool tadpole shrimp habitat. The Proposed Action would remove or otherwise affect the following sensitive biological resources: California tiger salamander habitat; Swainson's hawk foraging habitat; occupied burrowing owl nesting habitat; suitable nesting habitat for other special-status and non-special-status migratory birds; and kit fox residence and dispersal habitat. Because these species occur in various parts of eastern Merced County, it is reasonable to expect that other future development in this part of the County under the existing City General Plan, as well as under the General Plan Update that is underway, would similarly affect these resources in the study area. Although all projects would be required to reduce their individual impacts to a less than significant level as part of their environmental review process and permitting, however, some reduction in habitat would still occur. In addition, as discussed above, substantial amount of habitat in eastern Merced County has already been removed in conjunction with past development and other activities such as agricultural conversions. Therefore, the combined

effect of past, current and future projects on special status species habitat is considered a significant cumulative impact.

The University has placed more than 26,000 acres within the study area under conservation. These conservation lands contain comparable habitats to the habitats that would be lost as a result of project implementation. Furthermore, the University and University Community Land Company (UCLC) have committed to implement other strategies and mitigation measures included in the *Conservation Strategy*. In fact, the Proposed Action would contribute to the recovery of vernal pool species by implementing the five strategies emphasized in the Vernal Pool Recovery Plan (USFWS 2005), which are (1) habitat protection, (2) adaptive habitat management and monitoring, (3) status surveys, (4) research, and (5) public participation and outreach. UC Merced is implementing each of these strategies through its *Conservation Strategy*. In addition, mitigation measures are included in this Draft EIS/EIR and policies are included in the 2009 Long Range Development Plan (LRDP) and University Community Plan (UCP) to further minimize the Proposed Action's impacts on special status plants and wildlife species and their habitats. The high mitigation ratios that result from the University's conservation, restoration, and compensatory mitigation actions would more than compensate for the direct and indirect impacts of the Proposed Action. Therefore, the incremental contribution of the Proposed Action to the cumulative loss of habitat for all of the species listed above would not be cumulatively considerable. Furthermore, the Proposed Action includes adequate mitigation (**Mitigation Measures BIO-2, -7, -9,** and **-10**) to reduce its contribution to be cumulatively not considerable. The impact would be less than significant.

Alternatives 2 through 6

Although the acreage of native plant and wildlife habitat removed under each alternative varies, Alternatives 2, 3, 4, and 5, like the Proposed Action, would result in comparable impacts on special status plant and wildlife species and their habitat. Measures similar to those incorporated in the Proposed Action would also reduce the significant impact for each alternative and the contribution to the cumulative loss of habitat and species would not be cumulatively considerable.

Alternative 6, the No Build Alternative, would not result in the removal of any habitat and therefore, would not contribute to the cumulative loss of habitat and species.

Mitigation Measure: No mitigation is required.

5.3.5 Cultural Resources

Cumulative Impact CUL-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not damage or destroy unidentified prehistoric, historic or paleontological resources. (*Less than Significant*)**

The study area for potential cumulative impacts on cultural resources is eastern Merced County. The study area is defined above under **Cumulative Impact BIO-1**.

Cultural resource is the term used to describe several different types of resources, including archaeological, architectural, and traditional cultural properties. Archaeological sites include both prehistoric and historic deposits. Architectural properties include buildings, bridges, and infrastructure. Traditional cultural properties include those locations of importance to a particular ethnic group such as Native Americans. Some unquantifiable loss of cultural resources has occurred in the past in association with ground disturbing activities related to agricultural activities, water system development, urbanization and mining.

Alternative 1, Proposed Action

As discussed in **Section 4.5, Cultural Resources**, one known prehistoric site within the footprint of Community North is potentially considered a historic resource and could be adversely affected by development of the Proposed Action. However, mitigation would reduce this potential impact to a less than significant level. Furthermore, development under the Proposed Action could potentially unearth and damage buried cultural resources that were not identified during field surveys of the Campus and Community North, or may be present within the Community South area. However, implementation of UCP policies and additional mitigation measures would reduce this potential impact to a less than significant level. Record searches and surveys of the proposed routes for the Campus Parkway did not revealed any evidence of prehistoric archaeological resources, historic resources, or paleontological resources that might be adversely affected by that project. However, similar mitigation would be implemented to protect previously unknown resources encountered during construction. Similarly, other development in eastern Merced County pursuant to the City's current and proposed Updated General Plan could significantly affect cultural resources but the impacts would be evaluated and addressed by the environmental review process.

While compliance with environmental review process would ensure that known resources are adequately evaluated and protected and that appropriate mitigation measures are incorporated into the projects for

the protection of previously unknown cultural resources, some loss of unique or historic cultural resources could still occur. This potential future loss when combined with loss of cultural resources that have occurred in the past would result in a significant cumulative impact on cultural resources. However, the Proposed Action's contribution to the significant cumulative impact would not be cumulatively considerable because adequate mitigation is included in the Proposed Action to avoid, minimize, and mitigate for the project's effect. The impact would be less than significant.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the project sites for Alternatives 2, 3, 4, and 5, like the Proposed Action site, may contain unidentified cultural resources. Similar to the Proposed Action, the contribution of each of the alternatives to the significant cumulative impact would not be cumulatively considerable.

Alternative 6, the No Build Alternative, would not contribute to any cumulative impact to cultural resources.

Mitigation Measure: No mitigation is required.

5.3.6 Geology and Soils

Section 4.6, Geology and Soils, presents the Proposed Action's impacts related to geologic and soil conditions at the project site. Most of the geologic impacts such as those related to risk from faults, liquefaction potential, slope stability, landslide potential, expansive and compressible soils are site specific and do not cumulate. Therefore, the Proposed Action and other development in eastern Merced County would not result in a significant cumulative impact related to geologic risks. The one area where the impacts of the Proposed Action may cumulate with those of other projects is related to soil erosion and discharge of sediment into receiving waters during construction. That potential cumulative impact is discussed below.

Cumulative Impact GEO-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could result construction site erosion and sedimentation. However, compliance with federal, state and local laws and regulations would reduce this cumulative impact to a less than significant level. (*Less than Significant*)**

The study area for cumulative impacts related to construction-phase erosion and sedimentation would be all construction sites that could accidentally release sediment into Bear Creek. With respect to the Proposed Action, the potential pathway for such an accidental release would be Cottonwood Creek, because that is the only surface water body on the project site that flows into Bear Creek. Note that the canals on the project site are not expected to be affected by an accidental discharge of sediment from construction on the project site due to the presence of canal levees.

Alternative 1, Proposed Action

As discussed in **Section 4.6,** most of the soils at the Campus and University Community sites have moderate to slight erosion potential. Therefore, the likelihood of an accidental discharge of sediment into Cottonwood Creek during construction on the Campus or University Community is low. Furthermore, all construction projects would be required to comply with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit, which includes implementation of site erosion and sedimentation control BMPs. Similarly, other development in eastern Merced County, including the Campus Parkway project, would also be required by law to implement construction-site best management practices (BMPs) to control discharge of sediment and other pollutants during construction into receiving waters. Therefore, construction-site soil erosion would not result in a significant cumulative impact on the receiving waters. Furthermore, the Proposed Action's contribution to the cumulative impact would not be cumulatively considerable. The impact would be less than significant.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the project sites for Alternatives 2, 3, 4, and 5 have generally the same types of soil conditions as the Proposed Action site. Similar to the Proposed Action, compliance with state and federal regulations would reduce the impacts of each alternative to a less than significant level.

Alternative 6, the No Build Alternative, would not contribute to any cumulative impact related to geology and soils.

Mitigation Measure: No mitigation is required.

5.3.7 Hazardous Materials and Public Safety

Section 4.7, Hazardous Materials and Public Safety, presents the Proposed Action's impacts related to hazardous materials and public safety, including impacts related to routine transport, use and disposal of hazardous materials, impacts under accident conditions, impacts from emissions of hazardous materials,

and impacts associated with risk from wildland fires. The potential for these impacts of Proposed Action to cumulate with those resulting from past, present, and reasonably foreseeable future development are evaluated in Cumulative Impacts HAZ-1 and HAZ-2 below. The potential impact from exposure to existing on-site contamination would be site-specific and would not cumulate with other impacts and is therefore not discussed further below. The analysis in **Section 4.7** found the impact related to risk from aircraft operations would be less than significant as there are no public airports near the project site. The risk from the presence of a private airstrip near the project site would be a site-specific impact and would not cumulate, and therefore is not discussed further below. The analysis in Section 4.7 determined that impacts related to public safety would be less than significant with implementation of various safety measures to reduce the potential safety hazards associated with Le Grand Canal and Fairfield Canal. Because these impacts would be site specific, they would not contribute to a cumulative impact related to public safety.

Cumulative Impact HAZ-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would involve the use, storage, transport, and disposal of hazardous materials and wastes that could increase human health risk in the study area. (*Less than Significant*)**

The study area for potential cumulative impacts related to hazardous materials is limited to the project or alternative sites and their immediate vicinity as this would be the area that would be affected in the event of simultaneous accidental releases of hazardous materials and the area that would be affected by air emissions stemming from the routine use of hazardous materials.

The project vicinity consists of large tracts of undeveloped lands with dispersed rural residences. Phase 1 Campus is the one developed area with a small concentration of facilities, some of which involve hazardous materials use. Some hazardous materials use also occurs on agricultural lands, associated with the application of herbicides, pesticides and fertilizers. Similar conditions exist in the vicinity of the sites of the alternatives.

Alternative 1, Proposed Action

As discussed in **Section 4.7,** the use of hazardous materials and the generation of hazardous wastes by both the Campus and the University Community are not expected to result in significant impacts. Varying amounts and types of hazardous materials would be handled in daily activities and operations. Proper disposal of hazardous wastes would be based on regulations established by the US Environmental Protection Agency and the California Department of Toxic Substances Control. Compliance with

appropriate federal, state and local laws and regulations would minimize potential impacts for each project. Other development in the project vicinity including the development of the Bellevue Road corridor could also involve the use of hazardous materials. However, because each project would be subject to laws and regulations related to the use, storage, transport and disposal of hazardous materials and wastes, the cumulative risks associated with hazardous materials would be less than significant.

Land and building space for research and development (R&D) uses are provided in both the 2009 LRDP and the proposed land use diagram for Community North. UC Merced is also planning to develop a medical school on site. In addition, a substantial amount of land within the Bellevue corridor may be proposed to be designated for the development of R&D uses. The cumulative human health risk impact from exposure to toxic air contaminants from these uses cannot be estimated because the details of the actual types of laboratory uses (including the types and quantities of chemicals that would be used) that would be located on the Gateway area of the Campus and University Community as well as in the Bellevue corridor are not known at this time. As new laboratory facilities are proposed, human health risk from their development would be estimated by the Campus or the developer (in the case of Community North and the Bellevue corridor). Conservatively, it is assumed that the cumulative impact from the operation of these R&D facilities would be potentially significant.

However, the Proposed Action's contribution to the cumulative risk is not expected to be cumulatively considerable based on data from other UC campuses with similar site conditions and similar concentrations of research facilities. For instance, according to the 2003 LRDP EIR prepared for UC Davis which evaluated impacts from the development of the campus through 2015 to an enrollment level of 30,000 full-time equivalent (FTE) students, the cumulative human health risk from all on-campus sources (existing and future research laboratories, boilers and generators, on-site landfill, a cogeneration plant, etc for a total of more than 100 individual sources) was determined to be less than 8 in 1 million. (This impact is considered significant if the probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in 1 million) (UC Davis 2003). Given that UC Davis campus with a much larger existing and future research program (including a medical school and an extensive veterinary medicine program) and multiple toxic air contaminant sources is not expected to result in a significant human health risk in the region, UC Merced is also not considered likely to result in toxic air contaminant emissions that would result in a significant human health risk in the region. Therefore, the Proposed Action's contribution would not be cumulatively considerable. The impact would be less than significant.

Alternatives 2 through 6

The uses proposed under Alternatives 2, 3, 4, and 5 would also involve the use, storage, transport and disposal of hazardous materials. Similar to that for the Proposed Action, compliance with laws and

regulations would reduce the cumulative impact to a less than significant level for all alternatives. The contribution of Alternatives 2, 3, 4, and 5 to the cumulative impact related to human health risk would not be cumulatively considerable for the same reasons presented above for the Proposed Action. Alternative 6, No Build Alternative, would not contribute to any cumulative impact related to hazardous materials.

Mitigation Measure: No mitigation is required.

Cumulative Impact HAZ-2: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not significantly increase the risk from wildland fires. (*Less than Significant*)**

Alternative 1, Proposed Action

As discussed in **Section 4.7**, lands surrounding the campus site and lands on the east side of the University Community are open space covered with annual grassland and are therefore susceptible to wildland fires. Similarly, lands along the Bellevue corridor are also undeveloped land similarly susceptible to wildland fires. Although implementation of the Proposed Action would, by its nature, expose a greater number of people to wildland fire risk, development of the Proposed Action would be complemented by sufficient fire control measures. Proper control measures would be implemented by UC Merced and within the University Community by the County or the City to minimize the potential for a wildland fire. In addition, proper emergency response emergency evacuation plans would be established to provide efficient and comprehensive support in the case of an emergency. Therefore, implementation of the Proposed Action would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. Similarly, other development in the vicinity of the project site would also implement controls to minimize the risk from wildland fires. The cumulative impact is accordingly considered to be less than significant.

Alternatives 2 through 6

Similar to the Proposed Action, Alternatives 2, 3, 4, and 5 would also minimize the risk from wildland fires. The cumulative impact would be less than significant for the same reasons presented above for the Proposed Project. Alternative 6, the No Build Alternative, would not contribute to any cumulative impact related to wildland fires.

Mitigation Measure: No mitigation is required.

5.3.8 Hydrology and Water Quality

Cumulative Impact HYD-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could cumulatively increase surface runoff but would not substantially increase local and regional flooding. (*Less than Significant*)**

The study area for a potential cumulative impact related to flooding is the Bear Creek watershed because project site runoff as well as runoff from the sites of the alternatives would be discharged into Bear Creek.

The San Joaquin River is the primary river within the broader project region, which is approximately 4 miles northeast of the planning area. There are many reservoirs, streams, creeks, and agricultural drains in this region, including Lake Yosemite. According to the US EPA's Unified Watershed Assessment (UWA), the Clean Water Action Plan places the UC Merced Campus and University Community, as well as the City of Merced, within the Middle San Joaquin-Chowchilla watershed (Merced County 2004). This watershed area is included in the UWA program as a Priority Category I Watershed. A Category I watershed is defined as a watershed the environmental quality of which needs restoration.

Bear Creek is located to the south of the planning area and receives runoff flows from Fahrens and Black Rascal Creek. Bear Creek, Black Rascal Creek, and Fahrens Creek, all flow through the City of Merced, and are tributaries to the San Joaquin River. These creeks are part of the Merced County Streams Group. The headwaters of these streams are in the eastern portion of the County. The streams flow in a westerly direction and generally drain to the San Joaquin River. All of the streams in the group have historically experienced serious flooding problems that have stemmed from the lack of channel capacity which is aggravated by erosion and overgrowth of vegetation within the channels. Furthermore, high flows of moderate duration in these rivers and streams occur from intense rainstorms and result in flash flooding. In addition, snowmelt in the Sierra can produce high flows of longer duration during the spring. Channel capacity, especially within Bear Creek, has become even more inadequate relative to the flows as more impervious surfaces have been added in the creek's watershed, causing increased runoff to be discharged to the creek.

Alternative 1, Proposed Action

Development of the Campus and University Community would increase the total amount of impervious surfaces and therefore increase surface runoff within the on-site watersheds. This increased runoff would discharge into Bear Creek via Cottonwood Creek and Fairfield Canal. Other development in the project area, including the Campus Parkway project, would also increase the amount of impervious surfaces in

the project area and increase storm water discharges to Bear Creek. Cumulative effects are therefore discussed below in terms of the regional effects on Bear Creek.

Both the Campus and the University Community would release storm water flows to the Fairfield Canal and some limited storm water into Cottonwood Creek, both of which are tributary to Bear Creek. As discussed in **Section 4.8, Hydrology and Water Quality**, the storm water control system for the Campus and University Community would include on-site detention facilities (designed to capture the entire 100-year, 24-hour storm event) that would be operated so that storm flows would be detained and discharged into the Fairfield Canal at rates that would be determined and controlled by Merced Irrigation District which would avoid discharge of site storm water to Bear Creek during peak flows. This would preclude downstream flooding.

Similarly, all other development in the watershed of Bear Creek, including the Campus Parkway Project, would also be required to detain additional storm water generated by new impervious surfaces. The City of Merced General Plan currently requires the construction of storm water detention facilities as part of new development. This requirement would continue under the Updated General Plan. Because additional storm water runoff will be controlled and discharged at rates that would reduce the potential for flooding, the cumulative impact related to flooding is therefore considered to be less than significant.

Alternatives 2 through 6

Similar to the Proposed Action, Alternatives 2, 3, 4, and 5 would also include detention of additional runoff produced by new impervious surfaces and the release of storm water into receiving waters at rates that would not result in downstream flooding. Runoff from other new development will similarly be controlled. The cumulative impact related to flooding would be less than significant for all alternatives.

Alternative 6, the No Build Alternative, would not contribute to any cumulative impact because it would not generate any additional storm water runoff.

Mitigation Measure: No mitigation measure is required.

Significance after Mitigation: Less than significant

Cumulative Impact HYD-2: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would cumulatively increase surface runoff but would not substantially degrade water quality. (*Less than Significant*)**

Stormwater runoff from the project site would be discharged into Fairfield Canal and Cottonwood Creek, which in turn would discharge into Bear Creek. Therefore, the study area for a potential cumulative impact related to water quality is the watershed of Bear Creek, which eventually discharges into the San Joaquin River.

As described in **Section 4.8**, the CWA Section 303(d) requires states to adopt water quality standards for all surface waters in the United States. Section 303 (d) establishes the Total Maximum Daily Load (TMDL) process to assist in guiding the application of state water quality standards, requiring states to identify streams whose water quality is "impaired" (affected by the presence of pollutants or contaminants) and to establish the TMDL or the maximum quantity of a particular constituent that a water body can assimilate without experiencing adverse effect. Bear Creek is not listed as an impaired water body at this time. The 303(d) list however includes the San Joaquin River as an impaired water body and Bear Creek is a tributary to the San Joaquin River. The river is broken up into four sections for 303(d) listing: Mendota Pool to Bear Creek, Bear Creek to Mud Slough, Mendota Pool to Bear Creek, Mud Slough to Merced River, and the Merced River to South Delta Boundary. The San Joaquin River is broken up into these sections for the ease of developing TMDLs. The Proposed Action will ultimately discharge into the section of the San Joaquin River from Bear Creek to Mud Slough. However, the tributary rule states that upstream discharges (impaired or not) shall not contribute to downstream water quality issues. As a result, the Proposed Action shall not contribute to water quality problems in the other downstream impaired sections of the San Joaquin River. The section of the river from Bear Creek to Mud Slough is listed for boron, chloropyrifos, diazinon, DDT, Group A pesticides, electromagnetic conductivity (EC), mercury, and unknown toxicity. The San Joaquin River from Mendota Pool to Bear Creek is listed for all the above except mercury (SWRCB 2002). Most of the listed pollutants are largely a result of agricultural return flows. However, urbanized landscapes also contribute to some of the pesticide impairments on a small scale. Diazinon has been phased out and will unlikely be sourced from urban environments. Chlorpyrifos is still in use though. DDT is no longer in use, and it is only an impairment due to its resilience in the environment and the fact that it is hydrophobic and clings to the river sediment. Group A pesticides are largely linked to affecting aquatic life and are linked to urbanized environments as well as agriculture.

Alternative 1, Proposed Action

As explained in **Section 4.8**, both the 2009 LRDP and UCP require implementation of a set of BMPs for controlling releases of sediment and urban pollutants in storm water that will reduce the potential for deterioration of storm water quality. Storm water runoff from the Campus and University Community would be directed to on-site detention ponds before it is pumped into the Fairfield Canal. Limitations on velocity of the inflow and the rate of release would ensure that sediments, heavy metals, and similar contaminants are not discharged into the canal. In addition, low impact development (LID) measures, grassy swales, and biofilters would be used throughout the stormwater conveyance system to remove pollutants from runoff. Furthermore, all new development in the Bear Creek watershed would be required to comply with NPDES Phase II regulations and control releases of sediment and urban pollutants in storm water, which will reduce the potential for deterioration of storm water quality. In summary, although a substantial amount of land development within the Bear Creek watershed is projected to occur in the next 15 to 20 years based on the City of Merced General Plan Update, as a Phase II community, the City is required by law to develop and implement a storm water management program that addresses not only existing development but also all new development and requires that controls be included in new development that would avoid or minimize discharge of pollutants into receiving waters. This cumulative impact is accordingly considered to be less than significant.

Alternatives 2 through 6

Similar to the Proposed Action, Alternatives 2, 3, 4, and 5 would also include LID measures, bioswales, and other BMPs to control the release of urban runoff pollutants into surface waters. The quality of runoff from other new development would similarly be controlled. The cumulative impact related to surface water quality would be less than significant for all alternatives.

Alternative 6, No Build Alternative, would not contribute to any cumulative impact because it would not generate any additional stormwater runoff.

Mitigation Measure: No mitigation is required.

Alt 1 – Impact HYD-3: Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not substantially interfere with groundwater recharge but would deplete groundwater supplies resulting in an overdraft of the regional groundwater aquifer. (*Significant; Significant and Unavoidable)*

The study area for a potential cumulative impact on groundwater is the Merced Groundwater Basin (MGWB), generally described as the eastern half of Merced County. The basin underlies an area of approximately 582,000 acres (CH2MHill 2001).

The MGWB is the primary source of water in eastern Merced County and serves the water demand of urban areas as well as agricultural areas, although agricultural land uses also use surface water delivered by the Merced Irrigation District (MID). Surface water is also being considered by the City for non-potable uses such as landscape irrigation in schools and City parks.

The MGWB is not adjudicated and therefore the City, as a municipal water supplier, and other users in the area have the right to extract the needed groundwater for beneficial uses. However, because the groundwater basin is the main source of water supply in the region, the City and MID, in conjunction with other members of Merced Area Groundwater Pool Interests (MAGPI) (see **Section 4.8, Hydrology and Water Quality,** for more information regarding MAGPI.) recognize the importance of maintaining water levels and have prepared a strategy to manage groundwater which is described below.

The City and MID, in conjunction with MAGPI, have recently completed an update to the 1997 Groundwater Management Plan for MGWB that was issued in July 2008 (hereinafter 2008 GWMP). This plan responds to AB 3030, which requires that local agencies work cooperatively to manage groundwater resources within their jurisdiction to ensure both its safe production and its quality. According to the 2008 GWMP, groundwater levels within the MGWB have been monitored by DWR, MID, City of Merced and other entities since the 1950s. Using the data gathered by these entities, long-term hydrographs were prepared for wells distributed evenly throughout the basin. Based on these hydrographs, the 2008 GWMP determined that groundwater elevations throughout the basin have been declining with time, and since 1980, average groundwater levels in the MGWB have declined approximately 14 feet. The GWMP also notes the presence of several major cones of depressions within the basin centered on localized pumping centers in Chowchilla, Merced, and Livingston. Subsidence is not known to be occurring within the basin although the GWMP notes that it has been observed in one area around two wells. There is high variability in the quality of groundwater, especially groundwater in the upper water-bearing zone due to soil conditions, irrigation practices, and irrigation water quality. The 2008

GWMP notes that as of 2007, the groundwater basin is in a state of mild long-term groundwater level decline or overdraft (MAGPI 2008).

Water demand within the MGWB consists of agriculture, municipal, industrial, and environmental uses. Although agricultural demand within the MGWB is served by both surface and groundwater, based on the most recent water demand numbers, a total of 608,000 acre-feet/year of agricultural water demand (which includes 13,000 acre-feet/year within the MID service area and 595,000 acre-feet/year outside the MID service area) is met with groundwater. By comparison, municipal and industrial users pumped approximately 50,000 acre-feet of groundwater in 2007. Groundwater is not used for environmental uses, which include water releases for fisheries. However, because additional surface water is being used for that purpose, environmental uses have resulted in a reduction in the availability of surface water for irrigation purposes, forcing MID to pump more groundwater from the MGWB (MAGPI 2008).

Alternative 1, Proposed Action

The cumulative impact on the MGWB is discussed below in terms of (1) changes in recharge due to changes in land use and increased impervious surfaces, and (2) reduction in the volume of groundwater from increased extraction of groundwater to serve new development in eastern Merced County.

Impact on Groundwater Recharge

In general, the existing groundwater recharge potential throughout eastern Merced County is low due to the relative impermeability of the underlying soils and presence of a clay hard pan that significantly interferes with percolation of rainwater into the underlying aquifer. This is also true for most of the site of the Campus and University Community. As discussed in **Section 4.8**, the Proposed Action would not interfere with recharge within stream channels and canals. However, some reduction would occur on account of new impervious surfaces within the Campus and the University Community. Furthermore, some portions of the Community North and Community South lands are flood-irrigated which also helps recharge the underlying aquifer. This practice would be discontinued under the Proposed Action, as other uses would replace the current land uses. To address the potential for the reduced recharge of the groundwater aquifer, development within the Campus and University Community would contain retention and detention basins, bioswales, and open space areas that would detain rainwater and allow percolation and infiltration into the underlying aquifer. Similarly, other new development in eastern Merced County would, as directed by the policies in the City's current general plan and proposed General Plan, also maximize on-site recharge and minimize any reductions in recharge due to land use changes and increased impervious surfaces. Because recharge under existing conditions is low due to

impermeable soils, and new development will include measures to maximize recharge, the cumulative impact on groundwater recharge from increased impervious surfaces would be less than significant.

Impact Related to Groundwater Extraction

As noted above, the MGWB is the primary source of water in eastern Merced County and serves the water demand of urban areas as well as agricultural areas. New development in eastern Merced County, especially the growth within the City of Merced's existing and proposed SOI (which includes the Proposed Action), will require the extraction of additional groundwater from the MGWB. The cumulative impact from increased extraction of groundwater is discussed below.

As described in **Section 4.8**, the total amount of water needed to support the Proposed Action (Campus and University Community) at buildout is approximately 7,166 acre-feet (Stantec 2008). Surface water from the existing MID canals may be used to provide non-potable water to the Campus or the University Community in the future. However, conservatively it is assumed that all of the water supply would come from groundwater wells located within the boundaries of the Campus and University Community with or without a pipeline connection to the rest of the City of Merced water distribution system for reliability.

An adequate amount of water for the Campus has been included in all water planning documents prepared in Merced County since 1995. The 1995 Merced Water Supply Plan prepared by MID identified approximately 24,200 acre-feet/year for the Campus and University Community. In 2001, MID prepared an update to its Merced Water Supply Plan, which identified approximately 7,400 acre-feet/year to 11,700 acre-feet/year of water for the Campus and the University Community. This demand represents about 1 percent of the total future applied water demand for the region (CH2MHill 2001). The 2005 Urban Water Management Plan (UWMP) prepared by the City of Merced included the Campus in the City's water demand estimates, but did not include the associated community. The 2005 UWMP identified approximately 8,073 acre-feet/year at full buildout of the Campus, which was conservatively assumed to occur in 2025, the horizon year for the 2005 UWMP. The total amount of 7,166 acre-feet of water needed to support the Proposed Action is within the previous estimates and therefore would not involve extraction of more groundwater than previously planned by the local water purveyors.

The 2008 GWMP does not specifically include any projections of future groundwater demand. However, it references both the 2005 City of Merced Urban Water Management Plan (2005 UWMP) and the 2005 Merced Water Supply Plan Update prepared by MID. According to the 2005 UWMP, the average annual demand within the City of Merced service area will increase from 30,118 acre-feet/year in 2005 to 55,677 acre-feet/year in 2025 (this estimate includes 8,073 acre-feet/year for UC Merced). This represents an increase of about 85 percent from the 2005 demand. It should be noted that this demand estimate is based on the City of Merced housing, employment and residential population projections from 2004–2005

which projected that there would be a total of 37,067 dwelling units, a residential population of 114,867 persons, and an employment level of 51,383 employees within the SUDP in 2025 (excluding UC Merced). By comparison, as noted earlier at buildout (2030) of the General Plan Update that is currently underway, the City of Merced Plan Area would contain a total of 95,609 dwelling units, a total residential population of 280,666 residents and an employment level of 40,514 employees (these numbers include 36,000 residents associated with the Proposed Action). If the total water demand associated with the proposed General Plan Update is projected based solely on the change in residential population from the 2005 estimate to the current estimate (i.e., unadjusted for the proposed mix of housing, the change in employee population, or conservation and other demand management measures), the total water demand with the City's SOI in 2030 is estimated to be 136,000 acre-feet/year (this includes 8,073 acre-feet/year for UC Merced). This would represent a 350 percent increase over 2005 demand levels. Even if it is conservatively assumed that there would be minimal or modest increases in groundwater pumping by agricultural users and other urban communities in eastern Merced County, based on the adopted growth projections for the City of Merced alone, the total amount of groundwater withdrawal would increase substantially above existing conditions. If the yet to be adopted growth within the City were to be considered, the increase above existing conditions would be even more substantial. This increase has the potential to cause groundwater levels to decline within the MGWB, especially in the area of Merced. Some of the environmental and economic consequences of overdraft include land subsidence, degradation of water quality, well dewatering, and increased pumping costs.

The increase in groundwater demand based on the City's 2004/2005 growth projections is anticipated in the 2008 GWMP and even though the yet to be adopted growth projections are not included in the 2008 GWMP, the plan has been designed to manage and develop groundwater resources in a sustainable manner. As stated in the plan, "[t]he purpose of the GWMP is to identify and implement a number of actions using modern technology and sound science to preserve and/or increase the quantity of groundwater resources in the MGWB to ensure adequate groundwater resources for future generations." The GWMP is described as a living document and MAPGI notes that the progress in implementing the plan will be reviewed periodically with the current understanding of groundwater levels, quality, and trends. The GWMP includes four broad principles and Basin Management Goals (BMGs) to protect and maintain water quality; to protect and maintain water quantities and eliminate conditions of long-term overdraft; to protect and maintain groundwater recharge areas; and manage the basin with local control. The GWMP contains 14 elements focused towards the attainment of these goals. Key elements that focus on addressing the existing overdraft and ensuring that groundwater levels are maintained include the following:

- Element 5, Mitigation of Groundwater Overdraft
- Element 6, Replenishment of Groundwater Extracted by Producers

- Element 7, Monitoring and Controlling Groundwater Levels, Quality, and Storage
- Element 8, Facilitating Conjunctive Use Operations
- Element 10, Construction and Operation of Recharge, Storage, Conservation, Water Recycling, and Extraction Projects
- Element 12, Review of Land Use Plans and Coordination with Land Use Planning Agencies
- Element 13, Merced Groundwater Basin Groundwater Monitoring Program

The plan also outlines how these elements would be implemented and identifies the metrics that would be used to evaluate the effectiveness of implementation. In view of the fact that all local water purveyors have come together to address the issue of overdraft and to plan the supply of water in a sustainable manner, it is anticipated that all involved entities, including the City of Merced and UC Merced, would minimize the increase in groundwater extraction by minimizing water use through conservation and water recycling. Regional agencies such as MAGPI and MID will enhance conjunctive use operations by further improving recharge during years when surface water is available for this purpose, including in-lieu recharge, percolation of surface water in recharge basins, recharge through injection wells, and direct recharge through creeks. MAGPI will also pursue cooperative arrangements with state and local agencies for purposes of expanding the basin's conjunctive use capabilities (MAGPI 2008).

The implementation of the 2008 GWMP would reduce the potential for groundwater levels to decline further. However, the local water agencies are just commencing the implementation of the plan elements and the effectiveness of the plan remains to be demonstrated. Furthermore, because the groundwater basin is a mild state of overdraft and because a substantial increase in groundwater withdrawal is anticipated in the next 20 years due to regional growth, conservatively it is concluded that regional growth would result in a significant cumulative impact on the MGWB.

The Proposed Action includes numerous policies (both in the 2009 LRDP and in the adopted UCP) that are specifically designed to reduce the demand for potable water. While the water demand estimate for the Proposed Action reflects high levels of water conservation, the University and UCLC will continue to explore additional ways of reducing the use of potable water. The Campus will also evaluate the feasibility of a water recycling plant to further reduce the need for groundwater. Should the areas be annexed to the City, any additional water conservation measures that are developed by the City will be incorporated into both the Campus and the University Community. All of these measures would reduce the Proposed Action's contribution to the significant cumulative impact. However, even with these measures, the Proposed Action's contribution (both the Campus and University Community) to the significant cumulative impact would be considerable. **Cumulative Mitigation Measures HYD-3a** and **HYD-3b** are included to address this cumulative impact.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the size of the population and the land uses proposed under Alternatives 2, 3, and 4 would be the same as the Proposed Action. Alternative 5 would result in a lower but still substantial demand for groundwater due to the lower projected population compared to the Proposed Action. For the same reasons presented above for the Proposed Action, the cumulative impacts related to groundwater extraction would be significant for all of these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for groundwater and would therefore not contribute to a cumulative impact.

Cumulative MM HYD-3a: The University shall support MAGPI in pursuing and securing cooperative arrangements with state and local agencies for purposes of expanding the basin's conjunctive use capabilities.

Cumulative MM HYD-3b: The City of Merced should implement an aggressive water conservation program that will reduce water demand to levels that can be served on a long-term basis within the safe yield of the groundwater basin.

Significance after Mitigation: Significant and unavoidable

5.3.9 Land Use and Planning

Section 4.9, Land Use and Planning, includes an evaluation of land use impacts relative to three standards of significance: whether the Proposed Action (or the alternatives) would physically divide an established community; whether it would conflict with applicable land use plan, policy, or regulation; or whether it would conflict with any applicable habitat conservation plan (HCP) or natural community conservation plan (NCCP). As discussed in that section, the Proposed Action would not divide an established community or conflict with a HCP or NCCP, nor would it conflict with a land use plan applicable to the project. Because there would be no impacts related to an established community or an HCP/NCCP, the project would not contribute to a cumulative impact. With respect to the impact related to a conflict with an applicable plan or policy, given the nature of the issue, there is no potential for a cumulative impact. Further evaluation of cumulative land use impacts is not required.

5.3.10 Noise

Section 4.10, Noise, evaluates the potential noise impacts from the development of the Campus and University Community in terms of (1) permanent increases in noise that would stem from the increased

traffic along roadways used by the Campus and University Community-related population to access the site, (2) temporary increases in off-site noise from construction of off-site improvements associated with the Proposed Action, (3) temporary increases in on-site noise from construction activities, and (4) permanent increases in on-site noise levels from daily activities and traffic. To present the full impacts from the development of the entire Campus and the entire University Community, the analysis of noise impacts in **Section 4.10** evaluated the buildout of both areas which for purposes of the EIS/EIR was assumed to occur in 2030.

Therefore, Impact NOI-1 in **Section 4.10** evaluated the traffic noise that would result from growth in regional traffic through 2030 combined with the growth in traffic due to the Proposed Action at buildout. The analysis presents the cumulative traffic noise impact which was determined to be significant. **Section 4.10** also presents the cumulative traffic noise impacts for each of the other build alternatives. Mitigation measures are included to address the project's contribution to the cumulative traffic impacts.

With respect to cumulative construction noise and vibration impacts, those would occur only if the projects proposed by others were to be under construction the same time as the projects within the Campus or in the University Community and if these concurrent projects would be in close proximity of the same sensitive receptor. At this time, there are no other projects proposed that would be under construction the same time as the projects on the campus or the community. Similarly, in order for the on-site stationary noise (HVAC [heating, ventilating, and air conditioning], generators, pumps, etc.) associated with the Proposed Action to cumulate with noise from other stationary noise sources, the noise sources would need to be in close proximity of the same sensitive receptor. At this time, there are no other projects proposed that would be in the vicinity of the same sensitive receptors as the projects on the campus or the community. Further evaluation of cumulative noise impacts is not required

5.3.11 Public Services and Recreation

Cumulative Impact PUB-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in increased need for law enforcement services, the provision of which would not result in a significant cumulative environmental impact. (*Less than Significant*)**

The study area for a potential cumulative impact related to law enforcement includes the Campus, University Community, and the City of Merced.

The cumulative context for impacts on law enforcement services is the increased demand for law enforcement services as a result of residential and non-residential growth in north Merced under the adopted City of Merced General Plan as well as the General Plan Update that is in progress and is expected to be adopted in 2009 and the development of the Campus and University Community, along with existing development within the City. As noted earlier, little growth is expected to occur in this portion of unincorporated Merced County other than the growth within the University Community.

The projected growth in north Merced would be expected to result in the need for additional law enforcement services that would be provided by the City Police Department with assistance from the County Sheriff's office as needed. As stated in **Section 4.11, Public Services and Recreation**, the City Police Department plans to construct a new police station within the City of Merced in the next five years to serve the growth in north Merced. This police station could potentially be co-located with a fire station in the northern portion of the City of Merced.

Alternative 1, Proposed Action

The increased campus population associated with the Proposed Action would result in increased demand for law enforcement services on the campus, which would be handled by UC Merced Police Department. The Campus shall maintain a minimum ratio of 0.72 officer per 1,000 occupants. Development within the University Community would comply with UCP policies designed to ensure that adequate law enforcement service is provided to the University Community either by the County or by the City in the event that the University Community is annexed.

Other development in the City of Merced would increase the demand for law enforcement services and could potentially require the construction of a new police substation in north Merced. The City could construct the new police facility either within the University Community or off site at a nearby location. If the City builds the new police facility off site, it would follow a similar environmental review process. Although the review has not been done at this time, impacts from the development of a substation in general are expected to be less than significant because of the small footprint of such a facility (less than 1 acre) and the type of use that would occupy the built space. Furthermore, payment of developer impact fees for residential and non-residential development would be required by the City to fund the new police station. Impact fees would also address any environmental mitigation required in conjunction with the construction of the police facility. The cumulative impact from an increase in demand for law enforcement services would therefore be less than significant.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, 4, and 5 would also increase the demand for law enforcement services in a manner similar to the Proposed Action. Alternative 5 would result in a lower demand for law enforcement services than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, the cumulative impacts to the provision of law enforcement services would be less than significant for all of these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for law enforcement services and would therefore not contribute to a cumulative impact.

Mitigation Measure: No mitigation is required.

Cumulative Impact PUB-2: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would generate an increased demand for fire protection services, the provision of which would not result in a significant cumulative environmental impact. (*Less than Significant*)**

The study area for a potential cumulative impact related to fire protection services includes the Campus, University Community, and north Merced.

The cumulative context for impacts on fire protection services is the increased demand for these services as a result of residential and non-residential growth in north Merced under the adopted City of Merced General Plan as well as the General Plan Update that is in progress and is expected to be adopted in 2009 and the development of the Campus and University Community, and the existing development in the area. As noted earlier, little growth is expected to occur in this portion of unincorporated Merced County, other than the growth within the University Community.

The projected growth in north Merced would be expected to result in the need for additional fire protection services that would be provided by the City Fire Department with assistance from the California Department of Forestry (CDF) as needed. As stated in **Section 4.11**, the City of Merced has a Fire Protection Master Plan to accommodate growth in the Merced area, which includes the construction of nine new stations. A station is planned to be located within 1 mile of the proposed campus, near Bellevue Road and G Street. This station (Station 57 or 58) would be constructed when its services are determined to be needed based on the development levels in the City of Merced.

Alternative 1, Proposed Action

The increased population associated with the Proposed Action would result in an increased demand for fire protection services. A new fire station could be constructed in Community North to serve the Campus and University Community, or a new facility would be constructed in the vicinity of Bellevue and G Street to serve the Proposed Action and other growth in north Merced. Developer impact fees would fund the construction of new fire protection facilities, and would also pay for the cost of any environmental mitigation that is required in order to implement the fire station project. Given the small footprint (typically 0.5 to 1 acre) and the type of land use, the fire station project would not result in significant environmental impacts that would not be mitigated to a less than significant level. Therefore, the cumulative impact related to the provision of fire protection services would be less than significant.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, 4, and 5 would also increase the demand for fire protection services in a manner similar to the Proposed Action. Alternative 5 would result in a lower demand for fire protection services than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, cumulative impacts to related to the provision of fire protection services would be less than significant for all of these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for fire protection services and therefore would not contribute to a cumulative impact.

Mitigation Measure: No mitigation is required.

Cumulative Impact PUB-3: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would generate an increased demand for elementary and secondary school facilities, the provision of which would not result in a significant cumulative impact. (*Less than Significant*)**

The study area for a potential cumulative impact on schools is the service area of City School District, the Weaver Union School District, and the Merced Union High School District (MUHSD).

The cumulative context for impacts on school services is the increased demand for these services as a result of residential and non-residential growth in Merced under the adopted City of Merced General

Plan as well as the General Plan Update that is in progress and is expected to be adopted in 2009 and the development of the Campus and University Community. As noted earlier, little growth is expected to occur in this portion of unincorporated Merced County, other than the growth within the University Community in the event that the University Community is not added to the City's SOI or annexed to the City. The projected growth in Merced would be expected to result in the need for additional schools.

As stated in **Section 4.11**, some of the schools within the study area are at capacity, and at this time a new high school is planned. Enrollment growth projections through the life of the 2009 LRDP and the buildout of the University Community are not available. However, the MUHSD has a five-year facility plan, which is continually updated to monitor and project the growth in enrollment and to identify additional facilities needed to serve the growth in enrollment. Other school districts also have similar plans for the development of new facilities. Developer fees are collected in order to address the school impacts from new development. In addition, the school districts work with developers of large residential developments to provide land for the construction of new schools within the project site to serve the new population. The MUHSD is currently working with UCLC in this manner with respect to future schools within the University Community.

Alternative 1, Proposed Action

As discussed in **Section 4.11**, the increased population associated with the Proposed Action would result in an increased demand for educational services. The school capacity required to serve Campus-related households would be provided by the schools planned within the University Community. Adequate land has been assigned within the University Community for the construction of a high school and up to four K–8 schools. Similarly, new development within the City of Merced SOI would result in an increased need for elementary and secondary schools. All new development, including the development within the University Community, would be required to pay school impact fees, which are considered full and complete mitigation for school impacts. Therefore, the cumulative increase in demand for school facilities would be less than significant.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, 4, and 5 would also increase the demand for schools. Alternative 5 would result in a lower demand for schools than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, cumulative impacts to related to the provision of school services would be less than significant for all of these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for school services and would not contribute to a cumulative impact.

Mitigation Measure: No mitigation is required.

Cumulative Impact PUB-4: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in increased demand for library services, the provision of which would not result in a significant cumulative impact. (*Less than Significant*)**

Public library services are provided to the region by Merced County. Therefore, the study area for a potential cumulative impact on library services is eastern Merced County.

The cumulative context for impacts on library services is the increased demand for these services as a result of residential and non-residential growth in Merced under the adopted City of Merced General Plan as well as the General Plan Update that is in progress and is expected to be adopted in 2009 and the development of the Campus and University Community. As noted earlier, little growth is expected to occur in this portion of unincorporated Merced County, other than the growth within the University Community in the event that the University Community is not added to the City's SOI or annexed to the City. The projected growth in Merced would be expected to result in the need for additional library services.

The Merced County Library system includes the main library, which is located in Merced and regional branches located in Atwater, Dos Palos, Gustine, Livingston, and Los Banos. Library services in the County of Merced have been scaled back since 1993 due to lack of funding. In 1997, the City and County of Merced adopted a property tax sharing agreement in which the County would receive a share of the tax increment from Redevelopment Project Area #2 specifically for library purposes (Merced County 2004). The County library system still lacks the necessary funding to provide adequate circulation and staffing for existing libraries.

Alternative 1, Proposed Action

As discussed in **Section 4.11,** the increased population associated with the Proposed Action would result in an increased demand for public library services. However, the library system of the Campus, which would meet the needs of a modern research and teaching institution and provide a large array of library services, would be available to students, staff, and faculty of the campus, as well as the general public on a limited basis. The Campus library system would also contribute to Merced County's available library

resources, especially adult non-fiction and reference materials, which would permit the County public library system to reallocate resources toward other types of material, including resources for children. Other development within the City of Merced SOI and in unincorporated Merced County would increase the demand for library services. Therefore, the cumulative increase in demand for library services could require the construction of new library facilities or expansion of existing facilities. The environmental impacts from the construction of these facilities would generally be less than significant due to the small footprint of the project and the type of use that would occupy the built space. Therefore, the cumulative environmental impact from the construction of additional library facilities would be less than significant. Furthermore, the Proposed Action's contribution to this impact would not be cumulatively considerable given the library resources provided by the Campus.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, 4, and 5 would also increase the demand for library services. Alternative 5 would result in a lower demand for library services than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, cumulative impacts to related to the provision of library services would be less than significant for all of these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for library services and would not contribute to a cumulative impact.

Mitigation Measure: No mitigation is required.

Cumulative Impact PUB-5: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in a cumulative impact related to neighborhood and community parks, but would result in a cumulative impact associated with the deterioration of the Lake Yosemite Regional Park facilities from increased use. The Proposed Action's contribution would not be cumulatively considerable. (*Less than Significant*)**

Because Lake Yosemite Regional Park is a regional park, the study area for a potential cumulative impact on this facility is eastern Merced County.

The cumulative context for an impact on Lake Yosemite Regional Park is the increased use of the park facilities services as a result of residential and non-residential growth in Merced under the adopted City

of Merced General Plan as well as the General Plan Update that is in progress and is expected to be adopted in 2009, and the development of the Campus and University Community. As noted earlier, little growth is expected to occur in this portion of unincorporated Merced County, other than the growth within the University Community in the event that the University Community is not added to the City's SOI or annexed to the City. The projected growth in north Merced would be expected to result in the increased use of park facilities.

Lake Yosemite Regional Park is an important regional recreation facility serving thousands of area residents annually. The regional park is extensively used. The peak period begins on Easter Sunday and continues until mid-October. There are approximately 300,000 visits to the park annually. The park is currently at capacity during summer months.

Alternative 1, Proposed Action

As discussed in **Section 4.11,** the Campus and University Community include an adequate amount of parkland for the proposed increase in population of this area. Therefore, the development of these areas would not result in a cumulative impact on neighborhood and community park facilities in the region. To the extent that other development in north Merced results in an increased demand for neighborhood and community park facilities, the Proposed Action would not contribute to that demand.

As noted in **Section 4.11**, the one exception would be the Lake Yosemite Regional Park. As stated in Impact PUB-6, because the park is currently at capacity during summer months, this Draft EIS/EIR conservatively assumes that the use of the park by the Campus-related households could accelerate the physical deterioration of the park facilities and contribute to the need for new park facilities. Although new park facilities would be developed in the existing park and would not have significant environmental effects, and it is anticipated that most of the increase in park facility use associated with the campus (i.e., during periods in which the school is in session (i.e., fall until late spring) would generally not coincide with the current peak park use, nonetheless the deterioration of existing park facilities is considered a potentially significant impact associated with the Proposed Action.

Other development within eastern Merced County would also result in increased use of the regional park and would contribute to its deterioration and the cumulative impact would be potentially significant. However, the Proposed Action would implement **Mitigation Measures PUB-6a** through **PUB-6e**, which would render the project's contribution to the cumulative impact cumulatively less than considerable.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, 4, and 5 would also increase the demand for parks and recreational facilities. Alternative 5 would result in a lower demand for these services than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, the alternative's contribution to the cumulative impact on park facilities would be cumulatively not considerable for these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for parks and recreational facilities.

Mitigation Measure: No mitigation is required.

5.3.12 Socioeconomics/Environmental Justice

Cumulative Impact SOC-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would substantially increase regional population. (*Significant; Significant and Unavoidable)***

The study area for a potential cumulative impact related to population growth is eastern Merced County.

As noted earlier, a substantial increase in regional population is projected as a result of residential and non-residential growth in north Merced under the adopted City of Merced General Plan as well as the General Plan Update that is in progress. Little growth is expected to occur in this portion of unincorporated Merced County, other than the growth within the University Community in the event that the University Community is not added to the City's SOI or annexed to the City.

The past and currently projected growth in the study area population is reflective of the general growth in population throughout the Central Valley. While population in all of California has been growing rapidly, the Central Valley recorded a growth of 20 percent between 1990 and 2000, with the region's population increasing by almost 0.8 million. During the same time period, Merced County population increased by about 18 percent. Based on Department of Finance population estimates for the period July 2000 through July 2007, the population of California in the last seven years has grown by about 10.3 percent. During the same time, the population of the Central Valley (11 counties) has grown by 16.7 percent and that of Merced County has grown by 18.0 percent (Department of Finance [DOF] 2007).

Alternative 1, Proposed Action

As discussed in **Section 4.12, Socioeconomics/Environmental Justice**, buildout of the Campus would induce population growth in the study area by drawing 38,044 students, faculty, staff, postdoctoral researchers and the dependents of each group to the campus and its vicinity. Based on MCAG population projections, this would represent a substantial population increase within Merced County and the City of Merced, in the event that the Campus and University Community are annexed into the City. In addition, jobs within the University Community may potentially induce additional population growth in the area. Other development in eastern Merced County would also increase the regional population substantially. Based on the City's General Plan Update, if the proposed land use plan and projections are adopted, by 2025, there would be 280,666 residents within the City, including residents of the Campus and University Community compared to the City's current population of approximately 81,000 persons. The cumulative impact from this population growth would be significant. The Proposed Action's contribution (both the Campus and University Community) would be cumulatively considerable. No mitigation is available to reduce the Proposed Action's direct impact or its contribution to the cumulative impact.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, and 4 are generally the same as those under the Proposed Action and would include similar levels of population growth. Since Alternative 5 would not result in the development of a Campus or Community North, the population impacts would be reduced compared to the Proposed Action. All alternatives in conjunction with other development would result in a significant impact related to population, and each alternative's contribution to the cumulative impact would be cumulatively considerable.

Alternative 6, the No Build Alternative, would not directly or indirectly induce population growth, and would not contribute to the cumulative impact related to population growth.

Mitigation Measure: No mitigation measure is available.

Significance after Mitigation: Significant and unavoidable

5.3.13 Transportation/Traffic

Section 4.13, Transportation and Traffic, evaluates the potential traffic impacts from the development of the Campus and University Community in terms of the increased traffic along roadways used by the Campus and University Community-related population to access the site, and the impacts of this traffic

on roadway segments and intersections. To present the full impacts from the development of the entire Campus and the entire University Community, the analysis of traffic impacts in **Section 4.13** evaluates the buildout of both areas, which, for purposes of the EIS/EIR, was assumed to occur in 2030.

Impacts TRANS-1 and TRANS-2 in **Section 4.13** evaluated the traffic that would result from growth in regional traffic through 2030 combined with the growth in traffic due to the Proposed Action at buildout. That analysis therefore presents the cumulative traffic impacts which were determined to be significant and the Proposed Action's contribution to the cumulative impact was found to be significant (cumulatively considerable). **Section 4.13** also presents the cumulative traffic impacts for each of the other build alternatives. Mitigation measures are included to address the Proposed Action's contribution to the cumulative traffic impacts. With respect to other effects such as impacts on parking, transit, bicycle and pedestrian facilities, the Proposed Action's effects (and those of the alternatives) are addressed in **Section 4.13** and determined to be less than significant. At this time, there are no projects proposed in the immediate vicinity of the Proposed Action and therefore there is no potential for cumulative impacts related to parking, transit, and other transportation facilities. Further evaluation of cumulative traffic impacts is not required.

5.3.14 Utilities and Service Systems

Cumulative Impact UTILS-1: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not require the construction of new water supply facilities that would result in significant environmental impacts. The cumulative development would result in a substantial increase in demand for water which potentially could result in significant environmental impacts.** ***(Potentially Significant; Potentially Significant and Unavoidable)***

The study area for a potential cumulative impact related to provision of water service to the Proposed Action is the City of Merced's service area.

Much of the water in Merced County is drawn from groundwater sources. There are 25 irrigation and urban water districts that serve most of Merced County. These districts pump groundwater and divert water from the Merced River and out-of-County sources, including the Central Valley Project (CVP) and the State Water Project (SWP). The largest district is the MID, which diverts water from the Merced River for agricultural purposes. MID currently serves some of the area near the Proposed Action site and some of the alternative sites. However, within the exception of the Community South area, the Proposed Action

site is not within the service area of MID. The City of Merced provides potable water service within the city limits of Merced.

Groundwater is the main source of potable water for urban use. Discussion of the size and status of the underground aquifer that provides this water is presented in **Section 4.8,** and is summarized above in Cumulative Impact HYD-3**.** As noted there, the Merced groundwater basin is in a mild state of overdraft at this time.

Alternative 1, Proposed Action

Impact from Construction of New Water Facilities

As discussed in **Section 4.14**, in the event that the Campus and University Community are annexed to the City, the Proposed Action would require the construction of off-site water mains. However, due to their location within street right-of-ways, the environmental impacts from the construction of those facilities would be less than significant. With respect to the water supply source, water for the Proposed Action would be obtained from on-site wells. As discussed in **Section 4.14**, impacts from construction of on-site wells would be avoided by carefully locating the required wells. Other development within the City's service area would also require installation of new groundwater wells and water distribution pipelines. Environmental impacts from construction of wells (a well site typically involves between 0.5 and 1 acre of land) and from placement of water distribution lines within street right-of-ways are expected to be minimal and less than significant. The effect of new water wells on existing adjacent wells would be avoided by careful placement of the new wells by the City and by following the protocols that the City implements routinely in this connection.

In the event that the University Community is not annexed into the City of Merced, an on-site water utility district would be established by the County to supply potable water to the residents, institutions, and businesses within the University Community. The utility district would be responsible for installing new on-site wells and a piped distribution system. Consistent with UCP policies, the wells would be located in a manner that avoids drawdown effects on adjacent off-site wells. Therefore, there would not be a localized cumulative impact on local wells. The basin-wide cumulative effect from the extraction of additional groundwater to serve the Proposed Action in conjunction with the regional growth is evaluated in Cumulative Impact HYD-3 and is conservatively determined to be a significant impact.

Impact related to Adequacy of Water Supply

The development of the Campus and University Community would create a demand for water. Impact UTILS-2 (in **Section 4.14**) shows that the total amount of water needed to serve the Campus and

University Community is well within the amount identified for the Campus in all water planning documents prepared by the local water purveyors, including the City and MID. Other development in eastern Merced County would also place a demand on the City's water supply system. Because groundwater is the main supply source and the groundwater basin is not adjudicated, adequate water would be available to serve the Proposed Action and other development in the region. This would especially be true if the future growth in the City of Merced water service area were limited to the growth envisioned in the adopted 2015 Vision General Plan. However, a substantial increase in water demand is now projected based on the growth in residential population included in the City's draft General Plan Update. Given this substantial increase in demand that would result if the proposed General Plan Update is adopted, and given the fact that the MGWB is mildly overdrawn at this time, it is possible that over time the total supply of water from MGWB may become inadequate to serve the cumulative demand. As discussed in Cumulative Impact HYD-3, the local water agencies have developed a groundwater management plan (2008 GWMP) to ensure that groundwater is withdrawn at sustainable rates and that the basin is available to serve future generations. The plan includes elements that not only require local water agencies to implement programs to reduce the use of groundwater but also require the agencies to explore alternate sources such as recycled water and a conjunctive use program that emphasizes recharge of the groundwater aquifer using surface water during wet years when that water is available. In the event that the 2008 GWMP is successfully implemented, there would be adequate groundwater to serve the projected cumulative demand. However, as noted in that impact, because the 2008 GWMP has recently been completed and the local water agencies are just commencing the implementation of the plan elements, the effectiveness of the plan remains to be demonstrated. It would be speculative of this Draft EIS/EIR to conjecture whether the groundwater reservoir would decline to a point that it would become incapable of serving future uses. However, conservatively, it is concluded that the cumulative impact would be potentially significant.

In addition, recent literature indicates that global changes in temperature and precipitation patterns, along with the state's greater uncertainty in water supply reliability and changes in sea level all have the potential to impact water sources, including groundwater (see **Section 4.16, Global Climate Change** for more detail regarding this issue). As discussed in **Section 4.16,** groundwater supplies could be impacted directly and/or indirectly from global climate change affecting the long-term sustainability of groundwater supplies. Although there is limited factual data on how groundwater could be affected by global warming and whether groundwater sources would be relied upon during periods of climate fluctuations, this uncertainty is considered for the long-water supply that would be available to the Proposed Action.

Given that there is some uncertainty in the long run with respect to the availability of water to serve the Proposed Action, consistent with the Supreme Court's direction in the Vineyards Area Citizens case, the University and USACE have identified alternate water supply sources that potentially could be developed in the future to serve the Campus and University Community. These include the following three options: (1) a water recycling plant, (2) procurement of irrigation water from MID, and (3) procurement of potable water from MID.

1. Water Recycling Plant. As described in **Section 2.0, Project Description**, modular, small-scale treatment systems have been developed that allow for the treatment and recycling of wastewater streams. The modular treatment systems that are available at this time consist of water intake and solids concentrating equipment, a modular digester unit with an integrated methane collection system, methane gas scrubbers and various filters and polishers as required by the recycled water system. The methane that is generated in the digester is collected and scrubbed and can be used to power on-site electrical generation equipment or sold to market using the natural gas distribution piping. The power generation equipment typically is designed to be able to burn both the methane from the digester as well as pipeline natural gas and is capable of meeting all of the local air emission regulations. Dual fuel capability is useful to maintain a constant electrical output with varying methane production rates. The recycled water in these applications is treated to better than potable water standards. Recent industrial-scale applications of these technologies (up to 3 million gallons per day [mgd]) show water recycle rates of up to 95 percent of the wastewater flow volume. With up to 95 percent of the recycled water used for irrigation and industrial water uses, the remaining 5 percent would be discharged to the sanitary sewer system and therefore unlike conventional wastewater treatment plants, such a system would require no land or stream discharge of treated effluent.

Depending on the level of treatment, the Campus and University Community could use the recycled water for irrigation, industrial water (e.g., cooling tower water makeup) or as an additional potable water supply. Further studies of the technology will be conducted by the University and future cost/benefit analyses will determine the optimum configuration of any such on-site water treatment and recycling system. Note that one 3-mgd industrial-scale facility would be adequate to handle the total estimated wastewater (2.86 mgd) that would be generated under the Proposed Action. A 3-mgd facility would require approximately 3 acres of land. Adequate land is available within the Campus and University Community for locating such a facility.

If and when this option is pursued, additional environmental review will be conducted by the University and UCLC depending on the location of the facility. Preliminarily, environmental impacts associated with such a facility would be emissions from the power generation system using both methane from the water recycling system and piped natural gas. The primary pollutants would be nitrogen oxide (NOx) and

carbon monoxide (CO). The emissions could be controlled using common mitigation strategies including selective catalytic reduction (SCR) and CO catalysts. There would also be some limited PM_{10} (particulate matter 10 microns or less in diameter) and $PM_{2.5}$ (particulate matter 2.5 microns or less in diameter) emissions from the cooling tower that would be part of the power generation equipment. The digester would produce sludge material that would be similar to the sludge produced at a regular wastewater treatment plant and would require disposal in a landfill. The effluent that would be discharged to the sewer would be concentrated with salts and could require some dilution with potable water to allow for the City's wastewater treatment plant to accept and process that effluent. The polishers would use some treatment chemicals similar to those in a typical industrial water treatment system. The system would use energy to run the pumps, blowers and other equipment, but there potentially could be enough methane that there will be a net excess of electricity from the cogeneration equipment

2. Procurement of Irrigation Water from MID. The University and UCLC will evaluate obtaining irrigation water from MID via Fairfield and Le Grand canals. A "Sphere of Influence (SOI)" agreement between the University and UCLC and MID would provide non-potable water to the Campus and Community North during the irrigation season, which typically occurs from April to July, depending on seasonal Merced River conditions. UC Merced is already equipped with non-potable irrigation infrastructure, i.e., purple pipe, so implementation would be streamlined.

If and when this option is pursued, additional environmental review will be conducted by the University and MID. Preliminarily, it appears that there would be no environmental impacts associated with this option because MID would supply water to the Campus and Community North from the water it is allowed to withdraw from Merced River based on its water rights.

3. Procurement of Potable Water from MID. The University and UCLC will pursue the option of obtaining surface water for potable use from MID via the Le Grand Canal. MID maintains the future use of the Le Grand Canal for the conveyance of potable water by not allowing the discharge of any storm or wastewater into the canal. It is feasible that MID could construct a water purification system and sell potable water.

If and when this option is pursued, additional environmental review will be conducted by the University and MID. Preliminarily, the environmental impacts of this option could include reduced supply of surface water to agricultural users, which in turn could result in increased groundwater pumping.

In summary, the local water agencies will implement the strategies contained in the 2008 GWMP to avoid or minimize any further declines in groundwater levels so that groundwater remains a viable source in the long run. However, because of the substantial increase in groundwater withdrawal that is

projected based on regional cumulative population growth, it cannot be stated with any certainty whether or not the groundwater reservoir would decline to a point that it would become incapable of serving future uses. Therefore, conservatively, the cumulative effect is identified as a potentially significant impact and the Proposed Action's contribution (both the Campus and University Community) is considered cumulatively considerable. **Cumulative Mitigation Measures UTILS-1a** and **UTILS-1b** are included to address this cumulative impact. Should groundwater become a nonviable source, the University and UCLC has identified other potential sources of water supply that they will develop to meet the water needs of the Campus and Community North.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, and 4 are generally the same as those under the Proposed Action and would include similar levels of population growth. Since Alternative 5 would not result in the development of a Campus or Community North, the population would be reduced compared to the Proposed Action. As a result, all of the alternatives in conjunction with other development would result in a similar cumulative impact related to water supply.

Alternative 6, the No Build Alternative, would not directly or indirectly cause population growth and would not contribute to the cumulative impact.

Cumulative MM UTILS-1a: The University shall implement **Cumulative Mitigation Measure HYD-3a**.

Cumulative MM UTILS-1b: The City of Merced and MID should implement **Cumulative Mitigation Measure HYD-3b.**

Significance after Mitigation: Significant and unavoidable

Cumulative Impact UTILS-2: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would result in a significant cumulative impact on wastewater collection and treatment facilities. (*Significant; Significant and Unavoidable*)**

As discussed in **Section 4.14**, the Campus is currently connected to and served by the City of Merced wastewater collection and treatment system. It is anticipated that either with additional extra-territorial agreements or with annexation, the Campus would continue to be served by the City system. With

respect to the University Community, in the event that the area is also annexed to the City of Merced, wastewater service would be provided by the City's system. However, if the area is not annexed to the City, as required by UCP policies, adequate facilities to treat wastewater locally would be developed.

For purposes of cumulative impact analysis, the study area for a potential cumulative impact related to provision of wastewater service to the Proposed Action is the City of Merced's service area.

In 2006, an EIR was certified by the City that evaluated the environmental impacts from expanding the capacity of the City's WWTP to 20 mgd. Following the certification of the EIR, the WWTP expansion project was approved and the project is expected to be built in phases. This WWTP expansion will be implemented, to serve regional population growth with and without the campus. However, in developing its plans to expand the WWTP, the City anticipated that development of the campus would generate about 2.25 mgd and provided for this daily flow in its planned expansion.

Alternative 1, Proposed Action

As discussed in **Section 4.14**, although the increase in wastewater flows due to the Proposed Action would require the construction of sewer mains, the environmental impacts from the construction of those facilities would be less than significant. With respect to the treatment and disposal of wastewater, as discussed in Impact UTILS-3 (in **Section 4.14**), if 3.09 mgd associated with the Proposed Action were added to the existing flows and the City's WWTP were expanded per previously approved EIR, the Proposed Action would not result in the need for new or expanded wastewater treatment facilities. However, if the total daily flows from the Proposed Action (3.09 mgd) were to be combined with the flows (17.1 mgd) from the full development of the rest of the City of Merced SUDP under the current City General Plan, the total flows would be 20.19 mgd, just slightly over the capacity of the City's wastewater treatment plant (WWTP) (20 mgd) following expansion. Therefore, assuming no more growth in the Merced SUDP beyond the level included in the City's adopted General Plan (updated through 2005) and the approved WWTP expansion plan, wastewater flows from the cumulative growth would be largely accommodated by the City's WWTP.

However, as discussed in the beginning of this section, the City is in the midst of a General Plan Update which proposes a change in the City's SOI and projects a substantial increase in the total population within the revised SOI. Based on these revised growth projections, it appears that an expansion of the City's WWTP or the construction of a new wastewater treatment plant in the area of new growth will be required. No plans for the next phase of WWTP expansion or a new WWTP have been prepared at this time and therefore the nature and significance of the environmental impacts from the improvement project cannot be determined. Conservatively, it is assumed that any such improvement project would

result in one or more significant environmental effects that would not be reduced to a less than significant level by mitigation. By contributing to the need for this improvement project, the Proposed Action would also contribute to future significant unavoidable impacts and its contribution (both the Campus and University Community) would be cumulatively considerable. The University would implement **Cumulative Mitigation Measures UTILS-1a** and **-1b** to reduce the Proposed Action's contribution to the cumulative impact but not to a less than significant level.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, and 4 are generally the same as those under the Proposed Action and would include similar levels of population growth. Since Alternative 5 would not result in the development of a Campus or Community North, the population would be reduced compared to the Proposed Action. As a result, all of the alternatives in conjunction with other development would result in a significant impact related to WWTP capacity, and each alternative's contribution to the cumulative impact would be cumulatively considerable.

Alternative 6, the No Build Alternative, would not directly or indirectly cause population growth and would not contribute to the cumulative impact on WWTP capacity.

Cumulative MM UTILS-1a: The University shall continue to monitor and minimize the total amount of wastewater discharged from the site.

Cumulative MM UTILS-1b: The University shall evaluate the feasibility of developing a recycled water plant on the Campus or in Community North to further reduce wastewater flows discharged to the City's sewer system.

Significance after Mitigation: The proposed mitigation measures would reduce but would not render the Proposed Action's contribution cumulatively less than considerable. The impact would be significant and unavoidable.

Cumulative Impact UTILS-3: Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, could result in a significant cumulative impact on the regional landfill capacity. (*Significant; Significant and Unavoidable*)

The study area for a potential cumulative impact related to landfill capacity is eastern Merced County. The regional municipal solid waste disposal needs are served by the Highway 59 landfill, which is currently projected to reach capacity in 2035.

Alternative 1, Proposed Action

Implementation of the Proposed Action along with other development in eastern Merced County would increase the total amount of municipal solid waste that would require disposal at the Highway 59 landfill. As discussed in **Section 4.14**, it is anticipated that the Highway 59 landfill capacity will be reached in approximately 2035. While full development of the campus would generate more solid waste than existing conditions, it is anticipated that the Campus will attain its zero waste goal and eventually no solid waste would be disposed of in a landfill. In the event that the Campus does not meet its zero-waste goal, based on the existing diversion rate of 69 percent, the Campus would dispose of 2,611 tons of waste in the landfill at buildout. With respect to the University Community, implementation of UCP Policies ISW 1.1 would ensure provision of solid waste collection in accordance with state law and County policy. Implementation of UCP Policies ISW 1.2 and 2.1 through 2.7 would promote recycling opportunities as an integral part of the University Community. These measures would reduce the amount of waste disposed by the University Community.

Given the relatively small amount of municipal solid waste that would be generated by the Proposed Action, it is anticipated that Highway 59 Landfill would be able to accommodate the solid waste disposal needs of eastern Merced County through 2035. However, additional landfill capacity would need to be developed to serve the growth after 2035. Furthermore, the City is in the midst of a General Plan Update which proposes a change in the City's SOI and projects a substantial increase in the total population within the revised SOI. As a result of the revised growth projections, an expansion of the existing landfill or the construction of a new landfill could potentially be required even earlier than 2035. The nature and significance of the environmental impacts from the expansion of the landfill or the establishment of a new landfill cannot be determined at this time. However, given the characteristics of all landfills and the nature of resources present within Merced County, the environmental impacts would likely include loss of wetland and other habitats, air emissions, and water quality impacts. Conservatively, it is assumed that any landfill improvement project that is implemented to serve future growth will result in one or

more significant environmental effects that would not be reduced to a less than significant level by mitigation. By contributing to the need for this improvement project, the Proposed Action would also contribute to future potentially significant unavoidable impacts, and its contribution (both the Campus and University Community) is conservatively considered to be cumulatively considerable.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, and 4 and the size of the population is same and therefore the amount of solid waste generated under these alternatives would be comparable to that expected to result from the Proposed Action. Alternative 5 would result in a lower volume of solid waste than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, the contribution to the cumulative impact on the regional landfill would be cumulatively considerable for these alternatives.

Alternative 6, the No Build Alternative, would not result in any increased demand for landfill capacity and therefore would not contribute to a cumulative impact.

Cumulative MM UTILS-3: The City and the County should implement programs to minimize the generation of solid waste and further improve recycling and resource recovery efforts so as to reduce the need for new landfill capacity.

Significance after Mitigation: Significant and unavoidable

Cumulative Impact UTILS-4: **Development of the Campus and University Community, in conjunction with other past, present, and reasonably foreseeable future development in the project area, would not result in a significant cumulative impact related to electrical and natural gas facilities. (*Less than Significant)***

The study area for a potential cumulative impact related to provision of electrical and natural gas service to the Proposed Action is eastern Merced County.

As discussed in **Section 4.14**, the Campus and University Community sites are a part of the California Independent System Operator's Fresno local area. PG&E provides electricity to the City of Merced and to the Phase 1 Campus. There are three PG&E transmission lines near the campus site: the 230-kilovolt (kV) Belotta-Herndon line that originates at the Wilson Substation south of Childs Avenue and terminates north of Bellevue and west of Highway 59; the 115-kV Wilson-Atwater line; and the 70-kV Merced-

Merced Falls line. PG&E currently supplies Merced County, including the existing UC Merced Phase 1 Campus, with natural gas. The main pipeline serving the City of Merced is an 8-inch-diameter transmission pipeline that parallels Highway 99 through Merced. Phase 1 Campus is connected to the regional natural gas distribution system via a pipeline aligned along Lake Road. Additional distribution lines and hookups are generally constructed on an as-needed basis.

Alternative 1, Proposed Action

As discussed in **Section 4.14**, extension of a power line and a natural gas pipeline would potentially be needed in order to serve the Campus and University Community at buildout. Because these facilities would be located within already disturbed street right-of-ways, the environmental impacts from the construction of these facilities (which could also support other development in the area) would not be significant.

With respect to environmental impacts from the off-site generation of electricity that would be used by the Campus, University Community, and other development in eastern Merced County, there is no evidence that the demand would result in the construction of new electric and/or natural gas generating facility, such as a power plant. Because electricity and natural gas can be transmitted for long distances, these can be obtained from a wide range of sources, both in and out of California. As a result of this characteristic, it would be speculative to assume cumulative development would generate the need for a new electric generating facility, or where new facilities would be located, or to evaluate environmental impacts resulting from the construction and operation of new facilities in California. In addition, before new power plants are approved in California, an environmental document would be prepared that analyzes and discloses environmental impacts from the construction and operation of any new power plants and imposes mitigation measures as conditions of project approval to address significant impacts (UC Merced 2002). Therefore, the cumulative impact on electricity generating facilities is not considered further in this Draft EIS/EIR.

Alternatives 2 through 6

Although the precise location and footprint vary among the alternatives, the uses proposed under Alternatives 2, 3, and 4 and the size of the population is same and therefore the amount of electricity and natural gas demand generated under these alternatives would be comparable to that expected to result from the Proposed Action. Alternative 5 would result in a lower demand than the Proposed Action due to the lower projected population. For the same reasons presented above for the Proposed Action, the contribution to the cumulative impact on electric generating facilities cannot be evaluated.

Alternative 6, the No Build Alternative, would not result in any increased demand for electricity and natural gas and therefore would not contribute to a cumulative impact.

Mitigation Measure: No mitigation measure is required.

5.3.15 Other Resource Topics

Alternative 1, Proposed Action

As discussed in **Section 4.15, Other Resource Topics**, the Proposed Action and its alternatives would result in no impact to mineral resources or navigation. Therefore, the Proposed Action and its alternatives would not contribute to any cumulative impacts related to mineral resources or navigation.

Alternatives 2 through 6

Alternatives 1, 2, 3, 4, and 5 similarly would not result in a cumulative impact relative to mineral resources or navigation.

Mitigation Measure: No mitigation measure is required.

5.3.16 Global Climate Change

Given the nature of global climate change, generally an individual project of any size is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global inventory of greenhouse gases (GHG). Thus, GHG impacts are recognized as exclusively cumulative impacts (CAPCOA 2008). Accordingly, discussion of the Proposed Action's GHG emissions and their impact on global climate are addressed in terms of the Proposed Action's contribution to a cumulative impact on global climate. That analysis is presented in **Section 4.16**. As that analysis shows, the Proposed Action's contribution to the significant cumulative impact on global climate would be cumulatively considerable. The impact would be significant and unavoidable.

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6.0 GROWTH-INDUCING IMPACTS

6.1 INTRODUCTION

This section evaluates the potential for the Proposed Action to induce growth in eastern Merced County. Section 15126.2(d) of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* requires that an Environmental Impact Report (EIR) include a discussion of the potential for a proposed project to foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The National Environmental Protection Act (NEPA) identifies growth-inducing effects in the context of indirect effects and notes that the indirect effects of a Proposed Action may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, and other natural systems or ecosystems (40 CFR 1508(b)).

The *State CEQA Guidelines* do not provide specific criteria for evaluating growth inducement and state that it must not be assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment. Growth inducement is generally not quantified, but is instead evaluated as either occurring, or not occurring, with implementation of a project. The identification of growth-inducing impacts is generally informational, and mitigation of growth inducement is not required by CEQA. It must be emphasized that the *State CEQA Guidelines* require an EIR to "discuss the ways" that a project could be growth inducing and to, "discuss the characteristics of some projects that may encourage…activities that could significantly affect the environment." However, the *State CEQA Guidelines* do not require an EIR to predict or speculate specifically where such growth would occur, in what form it would occur, or when it would occur. NEPA does not provide any specific guidance as to the manner in which growth-inducing effects of a Proposed Action should be evaluated, although as noted above, it suggests that growth-inducing effects of the Proposed Action be examined for their related effects on air, water, and other natural systems or ecosystems.

For the purposes of this analysis, the Proposed Action would be considered growth inducing if it meets either of the following criteria:

- The Proposed Action causes economic expansion and population growth through employment expansion and/or the construction of new housing, or
- The Proposed Action removes an obstacle to population growth (for example, through the expansion of public services or utilities into an area that does not presently receive these services), or through the provision of new access to an area, or a change in a restrictive zoning or General Plan land use designation.

An evaluation of the Proposed Action compared against these criteria is provided below. In addition, because local land use plans provide for land use development patterns and growth policies allow for the orderly expansion of development supported by adequate public services, (e.g., water supply, roadway infrastructure, sewer service and solid waste service), growth induced by the Proposed Action would be considered adverse only if the growth is not consistent with the land use plans and growth management plans and policies for the area affected.

6.1.1 Growth Induced by Employment Expansion and Provision of Housing

Campus-related Direct Growth

The establishment of a large institution such as a major research university and associated development could result in a substantial growth in a region's population and employment. A new UC Merced Campus plus associated development within the University Community would draw students, faculty, and employees from both the surrounding region and other parts of the state and country. In addition to the direct population changes that would result from any nonlocal students, faculty, staff, employees, and their dependents relocating to Merced County, additional increases in employment and population could result as campus-serving businesses or other population-serving businesses move or expand in the area in response to increased demand.

The proposed Campus is projected to reach an enrollment of 25,000 full-time equivalent (FTE) students at full development and a total population of 32,185, including staff, faculty, and researchers. The analysis in this EIS/EIR assumes that about 10 percent of the total number of students would be existing residents of the area, and the remaining students would be non-local and would move into the area in order to study at UC Merced. Based on data from other university campuses, this analysis also assumes that 30 percent of all faculty and staff would be already living in the Merced area at the time that they are hired by the University and 70 percent would be non-local or "new" to the Merced area (see **Section 4.0** for demographic data and assumptions used in this EIS/EIR). Some of the non-local students, faculty, and staff would also be accompanied by dependents. Therefore by providing opportunities for education and employment, the Proposed Action would directly increase the population of Merced County by about 38,044 persons (**Table 6.0-1, Total Campus Related Population**).

Table 6.0-1
Total Campus Related Population

Population	Number of Persons (2008-09)	Number of Persons (2014-15)	Number of Persons (Full Development)
Total On-Campus Population[2]	**1,368**	**3,315**	**14,375**
Students in Off-Campus Housing			
Total Off-Campus Students	1,368	3,275	12,500
Commuters	274	655	2,500
Single Students	985	2,358	9,000
Students with families	109	262	1,000
Dependents	164	393	1,500
Subtotal	**1,258**	**3,013**	**11,500**
Faculty and Staff in Off-Campus Housing			
Total Faculty, Staff and Post Doctoral Researchers	822	1,968	6,560
Commuters	247	590	1,968
Non Local Faculty and Staff	575	1,378	4,592
Dependents	949	2273	7,577
Subtotal	**1,524**	**3,651**	**12,169**
Total Off-Campus Population[1]	**2,782**	**6,661**	**23,669**
Total Campus-Related Nonlocal Population[1]	**4,150**	**9,979**	**38,044**
Total Campus-Related Population[3]	**4,671**	**11,224**	**42,512**

[1] *Does not include commuters (students, staff and faculty already living in the Merced area)*
[2] *Numbers from* ***Table 4.0-1, On-Campus Population Estimates***
[3] *Includes commuters (students, faculty and staff already living in the Merced area)*

To address this direct growth, the 2009 Long Range Development Plan (LRDP) includes land area to house half of the campus's student population at full development. Also to address this direct growth and avoid environmental impacts from urban sprawl and unplanned development, the University Community is planned adjacent to the campus and includes an adequate amount of land for the development of 11,616 dwelling units for the campus-related non-local population that would be attracted to Merced County by the Campus. As discussed in **Section 4.12, Socioeconomics /Environmental Justice,** with half the students housed on the campus, the remainder of the students and all of the non-local faculty and staff would require a total of 8,175 dwelling units. Since the University

Community would include 11,616 dwelling units, there would be adequate housing for these non-local households.

In summary, the direct growth impacts of the new Campus would be captured within the Campus and the University Community. The environmental consequences of this direct growth are evaluated in relevant technical sections of this environmental impact statement (EIS)/EIR, including the effects of this growth on air, water, and ecosystems, as well as in the analysis of cumulative impacts. Specifically, the demand for housing associated with this direct growth is estimated and reported in **Section 4.12**, and the environmental effects from developing this housing within the Campus and University Community are evaluated in the other sections of this EIS/EIR and addressed by the mitigation measures included in this EIS/EIR.

Campus-Related Indirect and Induced Growth

The development of the Campus would not only result in the direct growth in County population as described above but would be expected to generate additional indirect and induced growth (hereinafter induced growth) within the regional economy through the workings of the income multiplier and the magnet effect of a major research university. The nature and magnitude of this induced growth is first discussed below, followed by a discussion of its environmental consequences.

In 2000, when the Campus was first proposed in Merced County, a study of the multiplier effect of the new campus was commissioned by Merced County. That study conducted by EPS analyzed the projected expenditures of campus students and employees and the expenditures made by the Campus within the regional economy and estimated the number of the induced jobs that would be supported by this spending (EPS 2000). That study concluded that the direct jobs at the Campus and the spending by the students and the University would generate approximately 6,000 additional jobs in the regional economy. Although several years have lapsed since that study, the basic assumptions and data upon which that study was based are still valid in that the Campus size is unchanged with an enrollment level of 25,000 FTE students at full development and the number of employees projected at full development are almost the same as the number used in that previous study. Therefore, the Campus is expected to result in approximately 6,000 induced jobs.

The results of that economic analysis formed the programmatic basis for the planning of the University Community. Based on that analysis, Merced County developed the size of the University Community and estimated that in addition to providing housing for campus-related non-local population that would live off campus; the University Community would provide commercial services, research and development space, and public services to the Campus population. The University Community was sized

to include adequate acreage for the development of space that would capture all of these 6,000 campus-related induced jobs. Because the size of the Campus (in terms of its population) and the size of the University Community (in terms of its population, land acreage, and housing) are largely the same as before, the University Community as planned would capture the entire indirect and induced growth effects of UC Merced. Thus, the University Community would be considered "growth accommodating." All of the secondary effects from developing the University Community to accommodate these 6,000 induced jobs, including the effects on air, water, and ecosystems, are evaluated in the various sections of the EIS/EIR.

The proposed revised University Community Plan (UCP) allocates approximately the same amount of land to locate these indirect and induced businesses and public services as was previously proposed in the 2004 UCP. The one area where the proposed revised plan differs from the previous plan relates to the amount of land allocated in the Community North for research and development uses. Compared to the adopted UCP which allocated 22 acres for research and development, the proposed revised UCP allocates about 75 acres for this use. This higher acreage included in the Community North is to allow the community to absorb the spin-off growth in research and development that would be expected to result from campus development, especially in light of the fact that a medical school may be developed at the campus in the near future. As shown in **Table 6.0-2, University Community Employee Population** below, based on the proposed revised plan for Community North, all of the indirect and induced uses (retail, public services, and research and development), when fully developed, are estimated to employ approximately 10,330 people within the University Community, above and beyond Campus employment. Note that this number is greater than the 6,000 indirect and induced jobs that were previously estimated to be accommodated by the University Community.

Table 6.0-2
University Community Employee Population

	University Community			Square Feet per Employee	Employees
	Community North	Community South	Total Square Footage		
Retail	392,100	250,000	642,100	400	1,605
Office	606,300	140,000	746,300	350	2,132
Research and Development	2,308,300	0	2,308,300	350	6,595
				Total Employees	**10,332**

The retail and office jobs that would be located in the University Community are not expected to result in substantial additional growth impacts of their own. A large influx of non-local population into Merced County in response to these indirect jobs and induced jobs in the University Community is not expected for several reasons. Merced County has a large number of employed residents who commute out of the county for work. According to the 2000 Census, approximately 18,300 Merced County workers commuted out of the county to work in neighboring counties in 2000. It is anticipated that some of these persons would take up the new jobs created in the University Community to change their commute patterns and work locally. The average annual unemployment rate in the county has also historically been high and has ranged between 9.5 percent and 15.2 percent in the last 10 years (Employment Developmental Department [EDD] 2008). Therefore, a pool of local labor should also be available to fill new positions associated with the proposed development. Furthermore, it should be noted that a large number of these indirect and induced jobs would be in the retail and services sectors and would not require special skills. Therefore, it would be reasonable to assume that the majority of these jobs would be filled by persons already residing in the area that either are unemployed or would like to change their commute, or by students at the campus, or dependents and spouses of the persons who move into the area in response to the new direct jobs.

While the above would be true for retail and service jobs, it would not be true for 6,595 research and development jobs located in the University Community as those jobs could result in the influx of non-local persons to the Merced area. Conservatively, assuming all of these 6,595 employees are non-local, and assuming 1.1 employees per dwelling unit, these jobs would create a demand for approximately 6,000 dwelling units. As discussed above, the University Community is planned to include 11,616 dwelling units and the students, faculty, and staff that would live off campus are expected to require approximately 8,145 dwelling units. Therefore, an estimated 3,440 dwelling units would be available within the University Community to house about half the households associated with these research and development jobs. The rest of these employee households (approximately 2,560) would seek housing in the greater Merced area.

As discussed in **Section 4.12**, a substantial amount of housing has been already been developed and additional housing is planned for this portion of Merced County. This housing growth would mostly be concentrated in the City of Merced, because developable lands that are already served by infrastructure are currently available. Planned/approved development projects within the City at present include up to 10,368 additional residential units within subdivision projects. Per the City of Merced General Plan Update growth projections, the City of Merced has planned for the development of 95,689 (Note that this number includes the housing for 12,500 students within the Campus and the 11,616 dwelling units within the University Community) additional housing units by 2030, which is calculated to be able to

accommodate a population growth of 280,666. Therefore, according to the General Plan Update and currently approved housing for the City, Merced would have ample housing to accommodate the households associated with these research and development jobs in the University Community. In addition, the number of dwelling units in Merced County is projected to grow to 131,725 by 2030.

In summary, the induced employee population that cannot be accommodated within the University Community would be easily accommodated by housing and services that are already developed or planned within the City and Merced County.

Notwithstanding the University's efforts to accommodate all of the growth generated by the Campus through the University Community planning process, it is recognized that some potential remains for induced growth to occur, particularly in geographic areas that are proximate to the Campus. The pressure to develop would be the greatest along the Bellevue corridor because of its location between the Campus and Castle Airport development area and its proximity to the Campus. Lands to the north and east of the campus could not be developed any way because they are conservation lands. Lands to the south of the campus would be developed as part of the University Community. Lands to the south of Yosemite Avenue would be too distant to experience the same growth pressure as lands along Bellevue corridor and besides those lands are prime farmlands and conversion of that land to urban uses would not be allowed under the County policies that control the conversion of prime farmlands.

The City's adopted General Plan already identifies development of lands on either side of Bellevue Road near Lake Road and the General Plan Update which is in progress also shows that this area as an area slated for development. It is reasonable to expect that the intensity and type of development that is eventually proposed in this area will be related to the land uses on the campus and the development of the campus would influence the pace at which this area develops. Given its relationship geographically and potentially programmatically as well as to the Campus, some of the growth in the Bellevue corridor would be considered campus-induced growth. However, by planning for this potential spin-off growth, the City is reducing the potential for haphazard and unplanned growth in the wider area in a manner that captures the residual growth that may otherwise occur as a result of the Campus. Much of the area in the Bellevue corridor is already included in the City's existing Sphere of Influence (SOI) and is anticipated for development in the City's adopted general plan. Therefore growth of this area is already accounted for in the City's previous planning efforts. The City plans to incorporate any new plans that are proposed for this area into its updated general plan and will evaluate the environmental effects of its development in the General Plan Update EIR currently under preparation. Additional environmental review would also be conducted when specific projects within the Bellevue corridor are proposed.

The significant environmental effects from the development of housing, retail and urban services in other parts of the City of Merced that are slated for development are evaluated in the 2015 General Plan EIR and include the conversion of farmland to urban uses; impacts on archaeological and historical properties; impacts on biological resources, including wetlands; effects on air, noise and water; and traffic impacts. Environmental impacts from the expansion of the City's SOI as proposed by the City at this time (including the Bellevue corridor) and the development of the City under the updated General Plan will be evaluated in conjunction with the development of the City's General Plan Update and are expected to also include conversion of farmland to urban uses, biological resource and cultural resources impacts, traffic, air quality, and water impacts. Development projects constructed within the City would be required to mitigate their significant environmental impacts in accordance with adopted General Plan policies.

The cumulative impacts of the Proposed Action combined with the effects from growth under the existing adopted City General Plan and the proposed General Plan Update are evaluated in **Section 5.0**. That section presents the complete range of the environmental impacts from all of the foreseeable growth in eastern Merced County. The cumulative impact analysis finds that the Proposed Action in conjunction with other past, present, and reasonably foreseeable growth in eastern Merced County would result in significant impacts on visual resources, important farmland, air quality, water supply, wastewater treatment capacity, traffic, and landfill capacity.

6.1.2 Removal of an Impediment to Growth

In addition to population growth from the provision of housing or employment, population growth in an area may also result from the removal of physical impediments (non-existent or inadequate access to an area or the lack of essential public services and utilities (e.g., water supply), or restrictions to growth, as well as the removal of planning impediments resulting from land use plans and policies, including restrictive zoning and/or general plan designations.

The proposed UC Merced Campus and University Community would require the expansion of the existing infrastructure systems to provide water supply, electricity, natural gas, wastewater collection and treatment, storm drainage, and other utilities and roadways. The potential for the envisioned utility extensions to induce growth is discussed below.

As described in **Section 2.0, Project Description** and analyzed in **Section 4.14, Utilities and Service Systems**, the water supply for the Proposed Action would likely consist of new on-site wells, water storage tanks, and an on-site water distribution system that would be connected to the City of Merced system. For wastewater, under one of two scenarios, UC Merced and the University Community would

be connected to the City's wastewater collection and conveyance system with treatment of the wastewater at the City's wastewater treatment plant. This hookup would require the construction of a wastewater main from one of three existing mains in the City to a point in the University Community. The stormwater conveyance system would incorporate detention basins as well as various sized conveyance pipelines and numerous pump stations to regulate the flow of stormwater. Other infrastructure improvements anticipated to be needed for the proposed Campus and University Community include: the designation of a site for a new fire station; the dedication of parcels of land for new elementary, middle, and high schools in the area; the construction of a pump station in the area; extension of power lines and natural gas service; development of Campus Parkway in the western portion of the University Community; and the development of new roadways throughout the Campus and University Community area.

Although the expansion of the existing infrastructure could effectively remove obstacles to growth in the area by allowing the provision of utilities and services to a new area, the new infrastructure would be designed for the primary purpose of serving the Campus and the University Community and no excess capacity would be provided. Therefore, the Proposed Action would not trigger any additional growth beyond that described in the analysis above. The Rural Residential Center (RRC) area along Lake and Bellevue Roads in the project vicinity currently relies on on-site septic systems and wells for potable and irrigation water. If excess water and wastewater capacity and points of connection for proposed project facilities were provided by the City along these roads, the provision of infrastructure to the Campus and University Community could trigger growth in the RRC area. However, a wastewater line to serve the Campus through full development has already been installed along Bellevue Road and the City has not allowed any connections to that sewer main from the rural residences along that roadway. Similarly, any additional extensions along Lake Road, Yosemite Avenue, or other local roads would not allow for connections to the rural residences until such time that the RRC area is included in the City's SOI/ Specific Urban Development Plan (SUDP) (It is acknowledged that all or a portion of the RRC area may be included within the City's revised SOI/SUDP and if and when that happens, any utility extensions that are proposed to serve the Campus and the community would likely be sized to also serve this area.). Furthermore, the County would continue to implement a Revenue Sharing Agreement with the City of Merced that limits development density of the RRC area to be no greater than one dwelling unit per acre. Because no infrastructure would be provided to these residences, the provision of infrastructure to the Campus and University Community would not induce growth in the project vicinity.

Furthermore, the Land Use, Agriculture, and Infrastructure policies of the UCP are specifically intended to eliminate the possibility that the provision of infrastructure to the University Community would induce growth on nearby lands where infrastructure limitations currently exist. Infrastructure

improvements would be sized according to the UCP requirements for fire protection, police protection, schools, water, wastewater, drainage, and streets. However, development of some infrastructure could precede development of certain phases of the University Community and, as a result, some UCP infrastructure would be sized to accommodate excess demand. However, in these instances, the excess demand would eventually be required for later phases of the UCP, which would already have been considered and approved under the General Plan. UCP Policy AA 2.1 would establish the SUDP boundary as an urban limit line, eliminating the possibility of incremental growth beyond the boundary. UCP Policies LU 2.9 and AA 2.4 prohibit the provision of infrastructure capacity to areas outside of the University Community and the Campus. Specifically, Policy LU 2.9 states:

> *Extend infrastructure and related services and utilities to urbanizing areas only following the adoption of a Specific Plan and pursuant to its specification for such infrastructure and services. No extraterritorial services shall be extended except where necessary to independently or jointly serve the University Community and UC Merced.*

For these reasons, the Proposed Action would not induce growth through the extension of infrastructure.

As noted above, growth can also be induced if restrictions to growth and other planning impediments resulting from land use plans and policies, including restrictive zoning and/or general plan designations are removed. The Proposed Action would require changes to the UC Merced/University Community SUDP boundary, changes to land use designations within the SUDP, a revision to the City's SOI to include all of the proposed Campus and University Community, and potentially eventual annexation of the entire project site to the City of Merced. The environmental effects of all of these changes are analyzed in the technical sections of this EIS/EIR.

6.1.3 Conclusion

Implementation of the Proposed Action would induce growth within Merced County. However, the University Community would accommodate almost the entirety of the growth induced by the Campus. Although some of the University Community employees would require housing that would not be provided by the Proposed Action, there is an adequate amount of housing that has been developed and planned, and additional housing is being planned at this time. The University acknowledges that there could be some residual growth that is not captured within the University Community. The University also acknowledges that there could be growth pressures on lands adjacent to the campus, especially along the Bellevue corridor and that this area would be most likely to absorb any residual growth. However, the City is planning to encompass the Bellevue corridor within its revised SOI/SUDP to guide the development of this area. Therefore, the induced growth due to the Campus would be adequately

accommodated by the land use planning that is underway. This land use planning would help reduce the environmental effects associated with the induced growth.

6.2 REFERENCES

California Department of Finance. 2008. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2008, with 2000 Benchmark.

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EPS. 2000. Merced County University Community Plan, UC Merced. Economic Background Report (EPS #9703). March.

Merced County. 2004. University Community Plan Final EIR. Prepared by EIP Associates.

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UC Merced. 2002. Long Range Development Plan Final EIR. Prepared by URS Corporation.

7.0 OTHER CEQA CONSIDERATIONS

7.1 INTRODUCTION

Section 15126 of the *2008 California Environmental Quality Act (CEQA) Statutes and Guidelines* states that an EIR must include a discussion of the following two topics:

- Significant environmental effects which cannot be avoided if the proposed project is implemented;
- Significant irreversible environmental changes which would be involved in the proposed project should it be implemented

In addition, Section 15128 of the *State CEQA Guidelines* requires a brief statement of the reasons that various possible effects of a project have been determined not to be significant and, therefore, are not evaluated in the EIR.

The following sections address each of these types of impacts based on the analyses included in **Section 4.0, Affected Environment and Environmental Consequences.**

7.2 SIGNIFICANT AND UNAVOIDABLE EFFECTS

This section identifies significant impacts associated with implementation of the Proposed Action that would not be mitigated to a less than significant level. As part of the certification process, The Regents of the University of California will make a final decision as to the significance of impacts and the feasibility of mitigation measures in this EIS/EIR. As detailed in **Section 4.0**, implementation of the Proposed Action would result in the following significant impacts that would not be mitigated to a less than significant level:

7.2.1 Aesthetics

Impact AES-1: **The Proposed Action would affect scenic vistas.**

Impact AES-3: **The Proposed Action would substantially alter the visual quality and character of the site and its surroundings.**

Impact AES-4: **The Proposed Action would create a new source of nighttime light and glare in the vicinity.**

7.2.2 Agricultural Resources

Impact AG-1: **The Proposed Action would convert Important Farmland (including Prime Farmland) to non-agricultural uses.**

7.2.3 Air Quality

Impact AQ-1: **The Proposed Action would result in construction emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.**

Impact AQ-2: **The Proposed Action would result in operational emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation.**

Impact AQ-4: **The Proposed Action would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).**

7.2.4 Noise

Impact NOI-1: **Implementation of the Proposed Action would result in increased vehicular traffic on the regional road network, which would increase ambient traffic noise levels at existing off-site noise sensitive uses.**

Impact NOI-2: **Daily operations within the Campus and University Community and special events at the Campus could expose existing off-site and future on-site noise sensitive receptors to elevated noise levels.**

7.2.5 Socioeconomics/Environmental Justice/Population and Housing

Impact SOC-1: **The Proposed Action would directly induce substantial population growth in Merced City and Merced County.**

7.3 ANALYSIS OF IRREVERSIBLE CHANGES

An EIR must identify any significant irreversible environmental changes that could be caused by implementing a project. These may include current or future uses of non-renewable resources, primary and secondary impacts that commit future generations to similar uses, and environmental accidents

associated with a project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified (*State CEQA Guidelines* Section 15126.2(c)). Development of the Proposed Action would result in or contribute to the following irreversible environmental changes:

- Conversion of 2,766 acres of undeveloped land and open vistas to urban and suburban land uses
- Conversion of 1,152 acres of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to urban and suburban development
- Increased air emissions
- Conversion of habitat and loss of endangered species
- Degradation of water quality from urban and suburban runoff
- Commitment of non-renewable energy resources for the operation of automobiles and construction equipment
- Consumption of other non-renewable and slowly renewable resources such as water, lumber, asphalt, metals, sand, and gravel
- Consumption of energy, natural resources, and goods and services associated with the future population

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9.0 ACRONYMS AND ABBREVIATIONS

AC	Academic Core
af	acre-feet
afy	acre-feet per year
AM	weekday morning
ASC	Agricultural Service Center
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
BAT	Best Available Technology
BMPs	best management practices
C	Celsius
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CBSC	California Building Standards Code
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFDs	Community Facilities District
CGS	California Geological Survey
CIWMB	California Integrated Waste Management Board
CKH	Cortese-Knox Hertzberg Local Government Reorganization
CLR	Campus Land Reserve
CNDDB	California Natural Diversity Database
CNR	Campus Natural Reserve
CO	carbon monoxide
CPEC	California Post Secondary Education Commission
CST	Cyril Smith Trust
CUPA	Certified Unified Program Agency
CVP	Central Valley Project
CVRWQCB	List of Water Quality Limited Segments
CWA	Clean Water Act
Delta	Sacramento Delta
DHS	The Department of Health Services
DOC	The California Department of Conservation
DOF	Department of Finance
DSOD	Division of Safety of Dams
DWR	Department of Water Resources

EC	electromagnetic conductivity
EDD	Employment Development Department
EH&S	The Campus Department of Environmental Health & Safety
EIR	Environmental Impact Report
EIS/EIR	Environmental Initial Statement and Environmental Impact Report
F	Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
fire department	City of Merced Fire Department
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FTF	full-time equivalent
G	Gateway District
GHG	greenhouse gases
gpm	gallons per minute
GSF	
GWP	Global Warming Potential
HCP	habitat conservation plan
HIC	Highway Interchange Center
hp	horsepower pump
IACUC	investigator and approved by the Campus Animal Care and Use Committee
ISO	Insurance Services Office
kV	kilovolt
kW	Kilowatt
LAFCO	Local Agency Formation Commission
LCC	Land Capability Classification Rating
LEED	Leadership in Energy and Environmental Design
LESA	Land Evaluation and Site Assessment
LID	Low Impact Development
LLDs	Landscaping and Lighting Districts
LOS	level of service
LRDP	2002 Long-Range Development Plan
MAGPI	Merced Area Groundwater Pool Interests
MCAG	Merced County Association of Governments
MCE	maximum credible earthquake
MCLs	maximum concentration levels
MCSD	Merced City School District
Merced County 2004	2004 University Campus Plan EIR
Merced PD	Merced Police Department
mg/L	milligram per liter

mgd	million gallons per day
MGWB	Merced Groundwater Basin
MID	Merced Irrigation District
MMBtu/hr	million British thermal units per hour
MOU	Memorandum of Understanding
MRZ	mineral resource zone
MS4	Municipal Separate Storm Sewer System
msl	mean sea level
MUHSD	Merced Union High School District
NCAA	National Collegiate Athletics Association
NCCP	natural community conservation plan
NEPA	National Environmental Protection Agency
NFIP	National Flood Insurance Program
NHD	University Community Neighborhood
NOP	Notice of Preparation
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PG&E	Pacific Gas & Electric
PM	weekday evening
PM_{10}	particulate matter 10 microns or less in diameter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
R&D	research and development
ROD	Record of Decision
ROG	organic gases
RRC	Rural Residential Center
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SCR	selective catalytic reduction
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SN	Student Neighborhoods
SOI	Sphere of Influence
SPCCP	speill prevention, control, and countermeasure program
SRA	State Responsibility Area
SUDP	Specific Urban Development Plan
SWP	State Water Project
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC/ALC	Technical Advisory Committee for Agricultural Land Conservation
TC	Town Center

TDM	transportation demand management
TDS	total dissolved solids
TES	thermal energy storage
the Regents	the Board of Regents of the University of California
TMDL	Total Maximum Daily Load
TZC	triple zero commitment
UBC	International Code Council 1997
UC Merced 2002	2002 Long Range Development Plan EIR
UC Merced	University California Merced
UC	University of California
UCB	Uniform Building Code
UCLC	University Community Land Company
UCM/CN	UC Merced/Community North
UCP	2004 University Campus Plan
umhos/cm	microsiemens per centimeter
US DOT	US Department of Transportation
US EPA	The US Environmental Protection Agency
US	United States
USACE	US Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	US Fish & Wildlife Service
USGS	United States Geological Survey
USPS	
UWA	Unified Watershed Assessment
UWMP	Urban Water Management Plan
VST	Virginia Smith Trust
WDRs	Waste Discharge Requirements
WUSD	Weaver Union School District
WWTP	wastewater treatment plant
ZLD	Zero Liquid Discharge
ZOI	Zone of Influence