TABLES

FIGURES

SECTION 4.14

Traffic, Circulation, and Parking

This section of the EIR evaluates the potential traffic, circulation, and parking effects from campus development under the 2005 LRDP. The section describes potential impacts to access, local and regional vehicular circulation, parking, pedestrian and bicycle facilities, and transit service.

Comments regarding the scope of the transportation analysis were received in response to the Notice of Preparation. These comments, summarized below, requested that the EIR analyze traffic, parking, and traffic hazards on streets surrounding the campus, specifically:

- Analyze cumulative impacts to Highway 1 and major arterials using the Association of Monterey Bay Area Governments (AMBAG) traffic model's cumulative 2020 land use forecasts
- Evaluate impacts associated with proposed new on-campus roadways and intersections
- Evaluate the impact of new vehicles, accessibility and traffic hazards for bicycles and pedestrians on County, City roadways, and state highways
- Evaluate the suitability of Empire Grade Road to accommodate additional traffic, and the impacts of campus support vehicles and trucks accessing the proposed corporation yard from Empire Grade Road
- Evaluate impacts of UC Santa Cruz uses of 2300 Delaware Avenue
- Evaluate impacts from transit services and Campus Transit routes accessing the campus and circulating within the campus
- Discuss the continuation and potential expansion of Transportation Demand Management programs including transit, carpool, vanpool and bicycle shuttle programs
- Evaluate and recommend expansion of the on-campus pedestrian and bicycle system
- Evaluate an eastern access to the campus with a link to an eastern campus transit hub and parking collection point
- Evaluate an alternative, which does not include building more on-campus parking, and evaluate an alternative including one or more off-campus parking structures linked to campus via transit
- Develop feasible mitigation measures for potential impacts, and formulate the campus's fair-share contribution to mitigation

All of these scoping comments are addressed in this section.

This section evaluates the traffic impacts from the projected campus growth in combination with anticipated area-wide development in the year 2020 under a cumulative scenario, which includes anticipated growth in the city and county of Santa Cruz. The most recent version of the AMBAG travel demand model (AMBAG 2005) was used to predict cumulative traffic growth. Traffic level of service analysis was conducted at 42 signalized and unsignalized on- and off-campus city intersections using the

2000 Highway Capacity Manual operations method.[1,2] The analysis forecasts traffic volumes on streets in the neighborhoods that surround the campus, and assesses potential effects with respect to parking on residential streets. On-campus evaluation includes parking supply and demand, and evaluation of new roads, bicycle, and pedestrian and transit systems.

Volume III of this EIR includes project-specific analyses for the Family Student Housing Redevelopment Project on campus and for use of campus-owned facilities at 2300 Delaware Avenue.

4.14.1 Environmental Setting

4.14.1.1 Study Area

The focus of the analyses reported here is the transportation effects of development under the proposed 2005 LRDP of the UC Santa Cruz main campus, including the 2300 Delaware Avenue property, a University property located in the west side of Santa Cruz. The study area for traffic and transportation analyses includes the main campus and the City of Santa Cruz, including all roadways surrounding the campus.

The study area for the traffic analysis includes intersections along the following corridors:

- Campus Loop – Heller Drive, McLaughlin Drive, Hagar Drive, and Glenn Coolidge Drive
- Empire Grade Road – Bay Street to proposed new campus entrance
- Bay Street/Bay Drive– High Street to West Cliff Drive
- Mission Street – Western Drive to Front Street
- Chestnut Street – Mission Street to Laurel Street
- Lincoln Street / Soquel Avenue – Mission Street to Capitola Road
- Water Street – Mission Street to Morrissey Boulevard
- San Lorenzo Boulevard / East Cliff Drive / Murray Street
- Other city streets including Delaware Avenue and Western Drive

Figure 4.14-1, *Circulation Network and Roadway Classifications*, shows the existing circulation network within the study area and identifies the intersections analyzed in the study.

4.14.1.2 Roadway System

The roadway system in the vicinity of the campus is composed of arterial highways and streets, collector streets, and local streets. In addition, truck routes and visitor/coastal access routes have been designated.

[1] 2000 Highway Capacity Manual, Special Report 209, Transportation Research Board (Chapter 10).
[2] Three additional intersections that currently do not exist but would be built under the 2005 LRDP were evaluated under 2020 conditions, but not under existing conditions.

The functional roadway classifications described below are based on access, mobility, and design (City of Santa Cruz Public Works Department 1992).

Arterial Highways and Streets – Arterial highways and streets carry the heaviest traffic volumes and provide regional and inter-city access.

Collector Streets – Collector streets provide access to travel within and between residential neighborhoods and commercial areas. Collector streets provide connections between local streets and the arterial highways and streets.

Local Streets – Local streets provide access to nearby properties and connect to arterial and collector streets. Transit routes are not typically located on local streets.

Truck Routes – The City has designated truck routes to direct truck traffic away from the community areas where this type of traffic is undesirable.

Main Campus Roadway System

The main campus is served by two roadway entrances: the main entrance at Bay and High Street intersection and the west entrance at Empire Grade Road and Heller Drive. Internal circulation on the campus is provided by the following roadways, listed alphabetically:

- Glenn Coolidge Drive is a County-owned arterial road that extends north into the campus from the main entrance, forms a portion of the eastern perimeter of the campus and then curves west to terminate at McLaughlin Drive, a campus roadway. Glenn Coolidge Drive is a two-lane street with bike lanes on each side and no on-street parking. The speed limit near the central campus is 25 miles per hour (mph). Between Hagar Drive and McLaughlin Drive the speed limit is 40 mph.
- Hagar Drive is a north-south roadway from Glenn Coolidge Drive to McLaughlin Drive. Hagar Drive is a two-lane road with bike lanes from Glenn Coolidge Drive to the entrance to the East Remote parking lot, an adjacent pedestrian path for most of its length, and no on-street parking.
- Heller Drive is a two-lane street that extends north-northeast from the west campus entrance at the Empire Grade Road intersection. The street experiences high volumes of pedestrian crossings and transit vehicles in the vicinity of College Eight and Porter College. Heller Drive has discontinuous sidewalks in some areas, but is served by a series of off-street paths that parallel Heller Drive, or connect Heller Drive to other parts of the campus. On-street parking is not permitted on Heller Drive.
- McLaughlin Drive is the primary east-west street serving the central campus. It completes the campus loop, connecting with Heller Drive at its west end and Glenn Coolidge Drive at its east end. The north end of Hagar Drive also intersects McLaughlin Drive. It is a two-lane street that experiences high volumes of use by campus pedestrians, bicycles, and transit vehicles. McLaughlin Drive provides sidewalks on both sides of the street and crosswalks at intersections. There are currently no bike lanes on McLaughlin Drive.
- Meyer Drive is a two-lane east-west road from Heller Drive to the Music Facility and the McHenry Library. Meyer Drive does not presently provide a through connection between Heller Drive and Hagar Drive. Meyer Drive does not have bike lanes.

- Steinhardt Drive is a two-lane east-west controlled access service road extending through the central campus core from Hagar Drive to McLaughlin Drive that experiences high volumes of pedestrians, bicycles and transit vehicles.

Off-Campus Streets and Highways

The following text describes many of the key off-campus streets that are used by traffic associated with the main campus and 2300 Delaware Avenue. The streets are listed alphabetically, and include roadway classification. County roads near or within the campus have posted speed limits of 40 mph, while City of Santa Cruz roadways have posted speed limits of 25 mph or 30 mph.

- Almar Avenue is a two-lane collector street extending north-south from Mission Street to West Cliff Drive and primarily serving residential uses. On-street parking is permitted.
- Bay Street is a northwest/southeast, two-lane arterial street within the city. North of Mission Street, Bay Street is a two to four-lane road and serves as one of the primary access routes to and from the campus. The two-lane section between Mission Street and Escalona Drive serves residential land uses and has houses fronting on the street. North of Escalona Drive, Bay Street becomes Bay Drive, a four-lane divided street with limited access to adjacent properties. South of Mission Street, Bay Street serves primarily residential uses and allows on-street parking while also providing access to a public elementary school and several churches. Bicycle lanes are provided in both directions from High Street to West Cliff Drive.
- California Street is a two-lane, north-south collector serving primarily residential uses and Santa Cruz High School. On-street parking is permitted on some portions of the street.
- Chestnut Street extends north-south and is a primarily a two-lane collector street from Mission Street to south of Laurel Street. It serves a mix of residential and commercial uses and provides a primary access route to downtown. On-street parking and a bike lane are provided north of Laurel Street.
- Delaware Avenue is a two-lane east-west arterial street, with bicycle facilities and on-street parking, that connects Shaffer Road in the west to Bay Street in the east. Delaware Avenue serves a mix of residential and low-intensity commercial uses on the west end. It is a primary east-west alternative to Mission Street and the primary access to the University's property at 2300 Delaware Avenue.
- Empire Grade Road is an arterial County road that extends northwest-southeast from the campus entry at Bay and High Streets to Alba Road in the North Mountain area of the county. It provides access to small rural communities north of the campus including the Cave Gulch and Bonny Doon neighborhoods. Empire Grade Road is classified as an arterial street, and has bike lanes and shoulders, south of Heller Drive. North of Heller Drive, Empire Grade Road becomes a winding roadway with relatively steep grades on some sections. The posted speed limit is 40 mph.
- Escalona Drive is a two-lane residential collector street with on-street parking.
- High Street is an east-west two-lane arterial street with bike lanes and limited on-street parking. High Street, along with Bay Street, is one of the primary access routes to and from the campus. High Street also provides access to a public elementary school and numerous churches. Significant campus traffic

and through traffic utilize High Street to access Mission Street via Storey and King Streets, causing peak-period congestion along this corridor.

- King Street is a northeast-southwest two-lane collector street with on-street parking that serves primarily residential land uses and a local school. King Street parallels Mission Street and historically experienced cut-through traffic and speeding, until the City installed speed humps. The eastern end of King Street currently experiences congestion as traffic accessing Mission Street feeds onto King Street from Storey Street and High Street.
- Laurel Street is classified as a collector west of Mission Street and as an arterial street through downtown between Mission Street and Broadway. It is a two-lane east-west street, with speed humps and on-street parking within residential neighborhoods. South and east of Mission Street, Laurel Street serves a mix of uses and accommodates the most heavily traveled Santa Cruz Metropolitan Transit District (SCMTD) transit route that serves the campus.
- Mission Street (Highway 1) is an arterial highway under the jurisdiction of Caltrans. Highway 1 parallels the coast, curving north and then east through the City of Santa Cruz, around the shore of Monterey Bay. West and north of the city, Highway 1 is a two-lane rural highway. East of Swift Street, Highway 1 is four-lane street. East of the Highway 1/SR 17 interchange, the highway becomes a controlled access freeway. Mission Street was recently fully widened to four lanes from Swift Street to Chestnut Street, with turn bays at selected intersections. Many of the intersections on Mission Street within the study area are signalized. The traffic signals were interconnected during recent construction, but Caltrans has not identified a schedule for implementation of signal synchronization.
- River Street extends north-south through the City of Santa Cruz and becomes SR 9 at the Highway 1/Mission Street junction. South of Highway 1, River Street is a two- to four-lane arterial street with bike lanes and limited on-street parking. River Street serves primarily commercial and industrial uses both north and south of Highway 1, and is a primary access route to the downtown.
- SR 9 is a two-lane arterial street traveling north-south from Highway 1 at the River Street junction. This highway provides access to Henry Cowell Redwoods State Park and communities to the north, including Felton, Ben Lomond, and Boulder Creek.
- SR 17 travels north-south connecting to San Jose from the Highway 1 junction in Santa Cruz. It is a four-lane controlled access highway.
- Storey Street is a two-lane arterial street extending north-south from High Street to King Street. On-street parking serves a number of fronting residences. Storey Street currently experiences long peak-hour vehicle queues at its stop-controlled intersection with King Street.
- Swift Street is a four-lane collector extending north-south from Mission Street (Highway 1) to the beach. On-street parking is permitted and bike lanes are also present. Swift Street serves a mix of low-intensity commercial offices and residential uses and also functions as the primary access route from Mission Street / Highway 1 to the University's 2300 Delaware Avenue facility.
- Walnut Avenue is classified as a collector west of Mission Street and as an arterial street elsewhere. West of Mission Street, it is a two-lane residential street with speed humps and on-street parking. East

of Mission Street, Walnut Street has bike lanes and serves Santa Cruz High School and a mix of residential and commercial uses within the downtown.

- West Cliff Drive is a two-lane collector street south of Bay Street, and a three-lane (two southbound) collector street north of Bay Street. West Cliff Drive is one-way from Pacific Avenue to Beach Street. It is adjacent to the coastline and carries sightseeing traffic.
- Western Drive extends north-south from Mission Street to Empire Grade Road and the west entrance of the campus. It is a two-lane collector with adjacent residential land uses intermittent on street parking and a relatively steep grade adjacent to Mission Street

Figure 4.14-1 illustrates the City's circulation network and roadway classifications.

Truck Routes

City-designated truck routes in the study area include the following:

- Mission Street (Highway 1)
- Bay Street/Bay Drive, north of Mission Street
- Empire Grade Road
- River Street (SR 9), north of Highway 1

Regional and Local Access

Regional access to the City of Santa Cruz and the campus is extensive. Highway 1 travels through the city, providing access to Monterey to the south and San Francisco to the north. Highway 1 connects to SR 129 and SR 152 in Watsonville, providing a connection to Highway 101 to the east. SR 9 provides access to the North Mountain area of the county and the Santa Cruz Mountains. SR 17, a major access road to the area, connects Santa Cruz to San Jose and the San Francisco Bay Area.

Local access to the campus is provided on two primary routes: Mission Street to Bay Street and Mission Street to Highland to High Street to Bay Street. Mission Street is accessible by many of the regional access routes described above. High Street is accessed from Mission Street via King Street and Storey Street. Secondary access routes include Western Drive and Empire Grade Road.

4.14.1.3 Campus Traffic Generation and Mode Share

Existing Campus Traffic Generation

In 2003-04, UC Santa Cruz population totaled approximately 14,050 students and 4,075 faculty and staff. UC Santa Cruz Transportation and Parking Services (TAPS) conducts periodic traffic counts on campus roadways and at the main and west gates. In 2003/2004,[3] the campus generated approximately 1,450 trips traveling to and from the main campus in the morning peak hour and approximately 2,040 trips in the

[3] Traffic volumes cited are from traffic counts conducted in fall 2003 and winter 2004 by TAPS. The counts reflect the average of Monday/Wednesday/Friday and Tuesday/Thursday traffic, which varies due to class schedule.

afternoon peak hour. The campus generated approximately 24,800 total vehicle trips traveling to and from the campus on an average weekday, as shown in Table 4.14-1.

Table 4.14-1
2003-04 UC Santa Cruz Campus Traffic (Total of Main and West Gates)

AM Peak Hour Traffic			PM Peak Hour Traffic			Average Daily Traffic
Inbound	Outbound	Total	Inbound	Outbound	Total	
1,149	303	1,452	828	1,212	2,040	24,830

Source: UC Santa Cruz Transportation and Parking Services (TAPS) traffic counts (2003)

Existing Campus Mode Share

A 2004 count of persons accessing the campus at the two main entrances by mode (UCSC 2004) indicates that single occupant vehicle (SOV) travel accounts for only 37 percent of all passenger trips to and from the campus (Figure 4.14-2, *UC Santa Cruz Modal Mix*). Carpools and Campus Transit buses comprise 27 percent of passenger trips; regional buses comprise 24 percent; and bicycles, pedestrians, motorcycles, and service/construction vehicles comprise the remaining 12 percent of trips accessing the campus.

4.14.1.4 Transportation Demand Management

Transportation Demand Management (TDM) emphasizes the movement of people and goods, rather than motor vehicles, and gives priority to public transit, ridesharing and non-motorized travel, particularly under congested traffic conditions. Many different TDM strategies have been developed to serve a variety of outcomes, from improving the reliability of transportation options to changing trip travel times, routes or modes, to increasing vehicle occupancy and reducing parking demand. Each TDM strategy may change travel patterns of only a small number of people; however, on a larger scale, the effects with respect to congestion management and other benefits can be significant.

The City of Santa Cruz Master Transportation Study (MTS), approved by the City of Santa Cruz in October 2003, identifies TDM as an important strategy to change travel behavior and sustain the City's transportation system over the long term. The goals of TDM include:

- Reduce the number of peak-hour vehicle trips;
- Shift trips to non-peak times;
- Increase vehicle occupancy by promoting carpooling, vanpooling, ride sharing and transit; and
- Increase the percentage of people bicycling, walking, ride sharing, or using transit.

Existing UC Santa Cruz TDM Programs

UC Santa Cruz manages a variety of TDM programs, which are detailed below and elsewhere in this section.

Parking Management. Like all UC campuses, UC Santa Cruz has established a parking management program to control the use of campus parking facilities. The parking management program is composed of the following:

- Transportation Systems and Demand Management (TSM/TDM) – Measures that discourage single occupant vehicles, and encourage transit, walking, and bicycling to reduce parking demand. Measures and programs are described below and under the transit and bicycle sections of this report.
- Zoned Parking – The campus is divided into 13 zones (plus the West and East Remote parking lots and some un-zoned parking areas). Zoned parking is used to monitor and manage demand for specific geographic areas of the campus. Managing demand is achieved through variations in fees and the use of parking permits.
- Parking Permits – UC Santa Cruz manages parking demand through issuance of a variety of types of parking permits, for commuters, residential parking, faculty/staff, graduate students, undergraduate students, reserved and disabled parking. First- and second-year undergraduates residing on-campus are prohibited from obtaining parking permits.
- Use of Remote Lots – The East and West Remote Lots provide parking supply for commuters and reduce demand for close-in parking in the campus core. The remote lots are served by Campus Transit.
- As a rule, the construction of new parking is planned based on utilization of existing parking supply. With the exception of parking directly associated with housing no new parking is constructed until TSM/TDM measures have been implemented and promoted and the utilization of the lots within a zone averages greater than 90 percent.
- Special Events Planning – TAPS is preparing a parking management plan to address parking demand associated with special events on campus. This plan is anticipated to be completed in late 2005.

Transit Programs. Since 1972, UC Santa Cruz has maintained a service agreement with SCMTD that provides any registered student access to any regularly-scheduled transit route operating within Santa Cruz County without paying a fare. In 1989, this agreement was extended to include any UC Santa Cruz faculty or staff member displaying a UC Santa Cruz Bus Pass. Under this agreement, SCMTD bills the University on a per-ride basis each month with the 2004-05 billing rate equivalent to 88.9¢ per ride. UC Santa Cruz accounts for more than one-third of the total SCMTD ridership countywide, with average daily ridership during the 2004-05 academic year exceeding 9,200 students and 750 staff and faculty. UC Santa Cruz's payments to the SCMTD for 2004-05 will be approximately $1.8 million. The UC Santa Cruz Bus Pass Program with SCMTD is funded from a self-assessed quarterly Student Transit Fee (for student ridership billings) and Parking revenues (for faculty and staff ridership billings).

In addition to SCMTD service (METRO buses), UC Santa Cruz's Transportation and Parking Services (TAPS) department operates the "Campus Transit" services described in Section 4.14.1.5.

Bike Shuttle Program. Introduced in Spring 1999, the TAPS Bike Shuttle provides campus bicycle commuters a ride up the hill from the vicinity of the Mission/Bay Street intersection through the campus, Ridership on the bike shuttle varies with the season and weather conditions, but averaged more than 75 passengers per day during 2004-05. Besides promoting bicycle use among campus commuters, this program reduces on-campus parking demand and campus-related vehicle traffic.

Commuter Vanpool Program. This program provides a commute alternative for faculty, staff, and students. TAPS currently operates 16 vanpools originating from Aptos, Capitola, Felton, Live Oak, Los Gatos, San Lorenzo Valley, Scotts Valley, Soquel Drive at Paul Sweet Road, and Watsonville. Demand is higher than available capacity, as indicated by waiting lists on several routes. Grants from the Monterey Bay Unified Air Pollution Control District (MBUAPCD) have funded the acquisition of many TAPS Commuter Vanpool vehicles. Approximately a dozen parking spaces in heavily utilized parking areas have been reserved for vanpool drivers. As of Winter 2005, more than 220 individuals participate in the Commuter Vanpool Program. TAPS plans to expand this program and increase the fleet with new "dual fuel" vehicles (with engines that can run on compressed natural gas).

Emergency Ride Home Program. Because UC Santa Cruz is a member of the Santa Cruz Area Transportation Management Association (SCATMA), UC Santa Cruz faculty and staff who commute once or more per week via transportation alternatives — carpool, vanpool, transit, or bicycle — are eligible to participate in the Emergency Ride Home program. Commuters who enroll in this program receive a voucher for a free taxi ride home if an emergency requires the need to leave campus unexpectedly.

Reserved Carpool Parking. In addition to the discounted permits discussed above, more than 50 designated carpool parking spaces have been reserved in prime locations within heavily-utilized parking lots as an added incentive to carpool.

4.14.1.5 Transit System

On-Campus

TAPS operates Campus Transit buses that serve the main campus and other UC Santa Cruz facilities in the city of Santa Cruz. It also works closely with other regional transit agencies to coordinate services. Transit service to the main campus and other UC Santa Cruz facilities are described below.

UC Santa Cruz Campus Transit. Campus Transit is the campus shuttle bus system operated by TAPS to serve the entire main campus. All Campus Transit routes are wheelchair accessible. UC Santa Cruz Campus Transit provides two daytime routes on campus, the Loop and the Day Core. Both routes operate Monday through Friday from 7:30 AM to 6:00 PM. The Loop route runs buses on 7-minute frequencies in both directions through the main campus. The Day Core route provides access to the inner campus core.

Campus Transit also provides nighttime on-campus transit service with the Night Perimeter and the Night Core route. These routes operate on 10- to 30-minute frequencies, and nighttime service is provided throughout the main campus.

TAPS Long Marine Lab Shuttle. TAPS operates the UC Santa Cruz Long Marine Lab Shuttle during the academic year. The shuttle provides service from the main campus to the University Business Park on Mission Street extension, 2300 Delaware Avenue, and to the Marine Science Campus. The shuttle travels counter-clockwise through the main campus and stops at westbound METRO stops. The

shuttle does not carry bicycles and does not operate during Summer quarter or on holidays; service schedules are adjusted quarterly to reflect class schedules at the Marine Science Campus.

TAPS Disability Van Service. TAPS Disability Van Service provides off-route door-to-door on-campus paratransit services for those with permanent or temporary disabilities. This service is available to staff, faculty, students, and visitors. No fare is required for the service, but service must be arranged in advance.

METRO Bus Service to UC Santa Cruz. The METRO bus system provides regional transit access to and through the campus. The METRO is operated by SCMTD and is the public transit system for Santa Cruz County. METRO buses run both directions through the main campus. METRO buses serve the main campus 8 to 12 times per hour during the academic year. During the Summer quarter and weekends, buses serve the campus three to four times an hour.

Bus shelters are located at all transit stops on campus. METRO bus routes from off campus that serve the campus are described below.

Provided under the University's service contract with METRO, the Night Owl operates from midnight until 2 AM Monday through Friday, and until 3 AM Saturday and Sunday and serves an area bounded by the beach, the San Lorenzo River, Western Drive and the main campus. Four to six Night Owl buses operate along the Route 16 University Laurel corridor, but can also go off-route to accommodate phone requests for pick-ups at other locations within the service area.

Off-Campus

METRO. The SCMTD provides bus service throughout the county. All METRO routes are wheelchair accessible. Transfers are available at the Watsonville Transit Center for connecting to Monterey Salinas Transit (MST) in Monterey County. The following routes depart from the METRO Center in downtown Santa Cruz. The routes within the study area include the following:

- Route 3B – (Serves the Marine Science Campus and 2300 Delaware Avenue)
- Route 10 – University (main campus via High Street)
- Route 12 – University (main campus from East Side)
- Route 13 – University (main campus via Walnut)
- Route 15 – University (main campus via Laurel) (this is most heavily utilized SCMTD route in UC Santa Cruz)
- Route 16 – University (main campus via Laurel) (this route traverses campus in a counter-clockwise direction)
- Route 19 – University (main campus via Lower Bay)
- Route 20 – University (2300 Delaware Avenue and main campus via Delaware Avenue and Western Drive)

- Route 41 – Bonny Doon / West Santa Cruz (serves Bay Street corridor, and the main and west entrances to the main campus as it traverses Empire Grade Road to Bonny Doon)
- Route 42 – Davenport / Bonny Doon (serves Bay Street corridor, and the main and west entrances to the main campus as it traverses Empire Grade Road to Bonny Doon)

Figure 4.14-3, *Existing Transit Routes to UC Santa Cruz Campus*, shows existing transit routes in the study area. There is no direct transit service from the campus to San Jose. However, METRO runs a Highway 17 Express from the METRO Center to San Jose Caltrans Station and San Jose State University.

Greyhound Bus Lines and Fremont BART Connector. The Greyhound bus terminal is located at 425 Front Street in downtown Santa Cruz. Greyhound has daily services to more than 2,200 locations in the United States, Canada, and Mexico.

Bay Area Rapid Transit (BART) offers rail service to most parts of the San Francisco Bay Area including San Francisco, the San Francisco Airport, Berkeley, Concord, Pittsburg, Richmond, and Pleasanton/Dublin. UC Santa Cruz offers a weekend shuttle between the main campus and the Fremont BART station, the closest station to Santa Cruz. Students, faculty, and staff can use this service for a fee.

4.14.1.6 Parking

On-Campus Parking Supply and Demand

UC Santa Cruz's Transportation and Parking Services (TAPS) department plans, manages, maintains and monitors the campus parking supply with strategies designed to ensure that existing parking capacity is well-utilized before additional parking is constructed, and also to ensure that excess parking capacity does not encourage single-occupant vehicle use. Parking capacity is managed in an area-specific manner that distinguishes between close-in and remote parking. Information on parking capacity and utilization is updated annually, with the most recent information reflecting conditions observed during spring 2005. Table 4.14-2 shows the campus parking supply by zone.

The period of highest campus-wide parking demand (4,077 vehicles, representing 84.2 percent of capacity), was observed on a Tuesday afternoon. The lowest parking demand was observed in the evening. Mondays had the lowest demand of the surveyed weekdays. Parking demand was fairly constant during the daytime periods, with at least 74.5 percent of the spaces occupied on average.

Table 4.14-2
Existing Main Campus Parking Supply by Zone

Location - Zone	Zone	Parking Capacity
Central Campus	1	619
Science Hill	2	686
Cowell/Stevenson Colleges	3	269
Crown/Merrill Colleges	4	385
Kresge College	5	144
Porter College	6	120
Oakes/College 8	7	251

Table 4.14-2
Existing Main Campus Parking Supply by Zone

Location - Zone	Zone	Parking Capacity
North Remote	8	109
Colleges Nine and Ten	9	235
Family Student Housing	10	237
Hagar Court	11	80
Campus Facilities	12	273
Main Entrance	13	134
East Remote	N/A	963
West Remote	N/A	286
Unzoned	N/A	49
TOTAL		**4,840**

Source: UCSC TAPS 2004.

Of the total 4,840 auto parking spaces available on-campus, more than two-thirds are allocated to permit-controlled parking. These 3,524 spaces had an average daytime utilization of more than 76 percent. The remaining 1,316 spaces are reserved for special uses and show an average daytime utilization of only about 59 percent. Utilization among reserved parking categories varies dramatically, from only about 26 percent among Disabled and Medical spaces to more than 80 percent among metered parking spaces.

Similar variations in parking utilization appear in relation to location. For example, permit-controlled parking in the campus core (Zones 1 and 2, the central campus and Science Hill areas) averaged 75 percent utilization while Crown and Merrill Colleges (Zone 4) averaged about 56 percent. Overall, 15 of the 75 inventoried on-campus parking areas experienced average daytime utilization rates among permit-controlled parking spaces of 90 percent or greater. These included parking lots within Science Hill, at Colleges 9 and 10 and the Cowell Student Health Center, and at Cowell College. The most heavily-utilized facilities are the three Remote lots, which together average 54 percent utilization of permit-controlled spaces. Utilization of the East Remote parking lot averaged 95 percent during the survey period and frequently exceeds 100 percent utilization through the use of attendant-managed "stacked" parking.

In addition to these 4,840 auto parking spaces managed by TAPS, another 382 "non-inventoried" parking spaces are associated with on-campus employee housing at Cardiff Terrace, Hagar Meadow and Ranch View Terrace (approved under the 1988 LRDP). Since these spaces are outside the control of TAPS, utilization of these parking spaces is unknown.

Finally, a total of 332 motorcycle parking spaces are also available on campus. The utilization of motorcycle spaces is quite low. The TAPS Spring 2004 Parking Utilization Survey found less than 21 percent occupied, on average. This figure parallels the relatively low mode share of motorcycles on campus (less than 1 percent) observed during the Spring 2004 Modal Mix Study conducted by UC Santa Cruz TAPS (UCSC 2004).

Off-Campus Parking Supply

The City of Santa Cruz has 17 parking lots in the downtown area. Thirteen parking lots are free with time constraints, and the remaining four parking lots charge a fee. All downtown on-street parking is subject to the Downtown Parking Permit Program. Throughout the remainder of the city, public parking is provided on-street, while off-street parking is private. The City of Santa Cruz operates six separate parking permit programs throughout the city in the following areas: Downtown, West Side, Beach Area, Lighthouse/Cowell Beach, East Side and Seabright.

Downtown Parking Permit Program. The Downtown Parking Permit Program was implemented in January 2004 to manage the downtown on-street parking facilities. The permit program affects the area between Water Street, North Pacific Avenue, the San Lorenzo River, and Pacific Avenue/Washington Street. The program offers options for employees and households.

West Side Residential Parking Permit Program. In response to increased levels of short- and long-term parking on streets in the west side, the City established the West Side Residential Parking Permit Program (RPP). The program is designed to address the problem of non-residents, such as UC commuters, using residential street parking to avoid campus fees and restrictions, and then using public transit to access the campus. The program restricts parking on certain west side residential streets to residents or short-term non-residential parking through a permit-controlled program. The West Side RPP is enforced Monday through Friday during the academic year (September 15th - June 30th). Parking in the program area during restricted hours without a permit is subject to citation and a fine. The program area has expanded over time as campus commuters have parked farther from campus and used more distant transit stops. The program presently covers the area generally enclosed by Western Drive, Mission Street, California Street, and Meadow Road.

4.14.1.7 Bicycle System

Figure 4.14-4, *Existing Bicycle Circulation Network*, shows the on- and off-campus bicycle circulation network. The City of Santa Cruz has a comprehensive system of bike lanes and paths, but some of the routes are discontinuous. The sections below discuss the on- and off-campus bicycle systems and access to the main campus and 2300 Delaware Avenue.

Existing On-Campus Bicycle Facilities and Services

Bicycle Lanes and Routes. As shown in Figure 4.14-4, the campus provides bike lanes on two of the primary access roads serving the campus. Bicycle lanes, continuous from Bay Drive, are provided on Glenn Coolidge Drive from High Street to McLaughlin Drive, and on Hagar Drive from Glenn Coolidge Drive to the entrance of the East Field House Office of Physical Education, Recreation and Sports (OPERS). An off-street bicycle path connects Glenn Coolidge Drive south of Hagar Drive to Meyer Drive, through the Great Meadow. Additional off-street paths are located throughout the campus, including unpaved fire roads and the U-Con trail in the north part of the campus which are used recreationally. Once bicyclists reach the ends of the bike lanes on Glenn Coolidge and Hagar Drives, they are required to share the road with vehicles. At many locations, campus roadways have narrow or no

shoulders, and there are substantial uphill grades from both campus entrances. Bicyclists generally require more width riding uphill. The narrower roadway sections are difficult for bicyclists to negotiate.

Bicycle Parking. Bike racks are located at transit stops on campus and near most major buildings. The total capacity of on-campus bicycle parking exceeds 2,300 spaces, based on a TAPS survey conducted in 1999; however, bicycle parking has been added with the construction of new buildings since 1999.

Bike Trailer and Shuttle. Because there are steep uphill grades up to and through the campus, TAPS operates a bicycle trailer and shuttle service from Olive Street/Mission Street to the campus on weekday mornings to encourage bicycle use as an alternative to motorized vehicles. The shuttle van has a trailer on which 14 bicycles can be loaded. The shuttle has two drop-off points on campus: the Physical Plant transit stop near the main entrance and the Engineering 2 Circle on the central campus. During the Fall, Winter, and Spring quarters, the bike shuttle operates on 15-minute frequencies between 7:00 AM and 10:15 AM. During the Summer quarter and breaks, the shuttle operates on 30-minute frequencies between 7:15 AM and 9:45 AM.

Bicycles on Buses. Campus Transit allows bikes to be loaded onto front-loading bike racks that carry two bicycles at a time; bikes are not allowed inside buses. Bikes can be loaded on the shuttle at the main entrance and at the Physical Plant transit stops. Bikes can be unloaded on the central campus at Science Hill and the Porter/College Eight transit stops.

Bikes are allowed on the UC Santa Cruz BART Connector buses. The BART Connector buses can carry only two bikes per trip, and bike rack reservations are required. Bicycles can be loaded and unloaded at designated stops only, and bikes cannot be carried inside the bus.

Santa Cruz METRO buses have also front-loading bicycle racks that carry two bicycles at a time.

Campus Bicycle Programs

Bicycle Maintenance. A weekly bicycle maintenance clinic is provided on-campus by TAPS and OPERS to assist students, faculty, and staff with keeping their bikes safe and functional.

Bike and Shower. The Bike Commuter Shower Program is available for UC Santa Cruz faculty and staff who commute to campus. Bike commuters are provided free access to the shower facilities in East and West Field Houses on campus.

Zero Percent Interest Bike Loan Program. The zero percent Interest Bicycle Loan Program is offered to faculty and staff of UC Santa Cruz through the Santa Cruz Area Transportation Management Association (SCATMA). UC Santa Cruz employees can qualify for an interest-free loan of up to a $750 to purchase a bicycle and bicycle accessories.

Bike Licensing. TAPS provides California bike licenses or renewal stickers for $3, with fees supporting the UC Santa Cruz bike programs. Bike licenses may be obtained at the main entrance kiosk or at the OPERS Bike Maintenance Drop-In Clinic.

Bike-to-Work Week. TAPS is an on-going sponsor of the local Bike To Work Week promotional campaign held each May and October.

Existing Off-Campus Bicycle Facilities and Parking

As shown in Figure 4.14-4, the City of Santa Cruz has an extensive system of bicycle facilities. However, many of the routes are discontinuous, and many streets do not have bicycle lanes. Bicycle access to the main campus from the west side of Santa Cruz is via streets with a system of bike lanes. There are significant gaps, however, in the bike lane system, specifically on Bay Street, Delaware Avenue, and Laurel Street. There are several local streets with low traffic volumes that serve as alternative routes for bicyclists. One of the primary difficulties for bicyclists is traveling along, or crossing, Mission Street to access bike routes leading to the campus, because the street experiences heavy vehicle traffic volumes and does not include continuous bicycle lanes.

The east side of Santa Cruz provides a more complete bicycle system, with bike lanes on many streets, particularly for east-west travel accessing the campus. The most notable gap in the system is along Soquel Avenue between Morrissey Avenue and Capitola Road. The City of Santa Cruz has completed a plan for closing this gap with bike lanes, but has not yet implemented the plan.

The City of Santa Cruz has adopted these definitions for bicycle facility classification:

- Bikeway – all facilities that primarily provide for bicycle travel
- Class I Bikeway (Bike Path) – provides bicycle travel on a travelway completely separated from any street or highway travelway. Bike paths are usually intended to provide travel routes not provided by the road system
- Class II Bikeway (Bike Lane) – provides a striped lane for one-way travel along a street or highway auto travel lane. Bike lanes are intended to delineate the portion of the right of way assigned to bicycles and automobiles, and to provide for more predictable movements by each
- Class III Bikeway (Shared Roadway; Bike Route) - provides for shared use with pedestrian or motor vehicle traffic. These routes are delineated to provide continuity to other bicycle facilities or to designate preferred routes through high demand corridors

Short-term bicycle parking is available on bike racks located throughout the downtown area

The City of Santa Cruz has 124 enclosed bicycle lockers available for rent to employees and residents of the downtown area. Additional bike lockers are located next to the SCMTD (METRO) Bus Station. A bicycle cage is available for bike storage in the Soquel/Front parking garage with the capacity to store 100 bicycles

4.14.1.8 Pedestrian System

On-Campus Pedestrian Circulation and Level of Service

The campus provides a pedestrian circulation network of pathways through forests and grasslands, and on sidewalks attached to roadways. In February 2004 UC Santa Cruz collected counts of pedestrians at 10 locations on the main campus from 9:00 AM to 5:00 PM (Urbitran 2004b).

The Urbitran study evaluated level of service (LOS) at four on-campus intersections to determine if crosswalk capacity is sufficient or the intersections require wider crosswalks. Level of service (LOS) for pedestrian conditions at intersections were estimated using a methodology from the 1994 Highway Capacity Manual (Transportation Research Board 1994). The study concluded that LOS A and B is sufficient to allow pedestrians to freely select walking speeds and avoid crossing conflicts, while LOS C results in minor conflicts and slightly lower walking speeds. Despite the delay for vehicles and transit, the crosswalk levels of service for the studied locations were LOS A and B for average conditions, and LOS B and C for swarm conditions. The study therefore did not recommend capacity improvements at the four studied intersections. Table 4.14-3 presents the UC Santa Cruz crosswalk capacity analysis. UC Santa Cruz does not have level of service standards for pedestrian conditions.

Table 4.14-3
Existing UC Santa Cruz Crosswalk Capacity Analysis

Location	Time	Crosswalk	Average LOS	"Swarm" LOS
Hagar Drive / Steinhart Way	10:45 AM-10:59 AM	West crosswalk	A	B
		West-south crosswalk	A	B
		North crosswalk	B	C
		South crosswalk	A	B
Hagar Drive / McLaughlin Drive	10:45 AM-10:59 AM	West crosswalk	A	B
		South crosswalk	A	B
College Ten / McLaughlin Drive	1:45 PM-1:59 PM	East crosswalk	A	B
		North crosswalk	A	B
		South crosswalk	A	B
Heller Drive / McLaughlin Drive	12:00 PM-12:14 PM	East-south crosswalk	A	B
		South crosswalk	A	B

Source: Urbitran Associates – UC Santa Cruz Pedestrian Data Collection and Analysis (Urbitran 2004a)

Notes:

"Average Conditions" assume pedestrians are evenly distributed for the 15-minute time period.

"Swarm Conditions" assume pedestrians travel in clusters, as may occur at class change times.

The Urbitran Study also evaluated vehicular delay caused by high levels of pedestrian crossings. At the 10 locations studied, most of the intersections experienced vehicular delays of less than 60 seconds, except the intersection at the College Eight/Porter bus stops which experiences average vehicular delays of more than a minute and a half. It was also determined that pedestrians were the main contributor to increased vehicular delay during class change times.

Off-Campus Pedestrian Circulation

While only 1 percent of the trips accessing the campus are made by walking, the provision of pedestrian facilities is important. The City of Santa Cruz contains 135 miles of streets. More than 65 percent of these miles of streets have sidewalks on both sides of the street. The City of Santa Cruz *Pedestrian Master Plan* (October 2003) identified 50 miles of missing sidewalks on one or both sides of the 135 miles of streets maintained by the City. On routes that provide access to the main campus, notable gaps in sidewalks are found on High Street and on local streets in the surrounding residential neighborhoods, and on Western

Drive. The remaining key streets accessing the campus and nearby bus stops (e.g., Bay Street/Bay Drive, Mission Street, California, King, etc.) have continuous sidewalks.

4.14.1.9 Transportation-Related Agencies in the Santa Cruz Region

Association of Monterey Bay Area Governments

Association of Monterey Bay Area Governments **(**AMBAG) is an organization composed of city governments in Monterey, San Benito, and Santa Cruz Counties. This organization addresses regional transportation and air quality issues. AMBAG facilitates and coordinates the programming and budgeting of all regional transportation planning and projects. In addition, AMBAG develops and maintains a travel demand model for use in Santa Cruz and the surrounding region.

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for the design, construction, maintenance, and operation of the California State Highway System and Interstate System in California. This agency's goals include roadway safety, minimization of traveler delays, make transit a more practical travel option and improve the efficiency of the California transportation system. In the project vicinity, Caltrans is responsible for Highway 1 (Mission Street), SR 9, and SR 17.

Monterey Bay Unified Air Pollution Control District

Monterey Bay Unified Air Pollution Control District (MBUAPCD) is an 11-member elected governing body responsible for the Air Quality Management Program under the California Clean Air Act. The MBUAPCD monitors air quality including emissions from mobile sources and adopts transportation control measures to reduce air emissions. The measures include expanding TDM programs, improving transit services, traffic-efficient operational improvements (e.g., signal synchronization), park and ride lots, and use of alternative fuels.

Santa Cruz Area Transportation Management Association

Santa Cruz Area Transportation Management Association (SCATMA) is composed of businesses and government agencies working to address transportation problems in the northern part of Santa Cruz County. One SCATMA goal is to encourage more efficient use of the transportation system.

Santa Cruz County Regional Transportation Commission

Santa Cruz County Regional Transportation Commission (SCCRTC) sets priorities for major capital improvements, allocates funding for the transportation system, adopts policies and plans future projects to improve mobility, access and air quality, and encourages the use of alternative transportation. This agency is responsible for preparing the County's Regional Transportation Plan and Transportation Improvement Program. In addition, SCCRTC also manages the Commute Solutions Program.

Santa Cruz Metropolitan Transit District

SCMTD provides the mass transit (METRO bus) system for Santa Cruz County. In addition, it is responsible for developing the Short Range Transit Plan for the area.

UC Santa Cruz Transportation and Parking Services

TAPS is responsible for transportation services for students, faculty, and staff. TAPS oversees transit services, parking permits, facilitates and implements TDM measures, and manages the campus bicycle, pedestrian and vehicle circulation systems and sources.

City of Santa Cruz

The City of Santa Cruz Department of Public Works manages parking and is responsible for engineering and maintenance of city streets. In April 2000, the City of Santa Cruz and the University of California at Santa Cruz initiated a partnership to jointly fund a community-based approach to planning the City's transportation future. The Master Transportation Study (MTS) integrates pedestrian, bicycle, transit and street transportation plans and programs as a foundation for updating the City's General Plan, City zoning ordinance, UC Santa Cruz's LRDP and other city and regional transportation planning documents.

The MTS recommends three actions:

- Adopt a series of 12 strategic initiatives concerning land use, transit, pedestrian systems, bicycles, Transportation Systems Management (TSM) measures, parking and TDM, regional planning, and education
- Adopt an aggressive multi-faceted campaign including TDM measures and short distance local transit services, to increase person-trip mobility by 19 percent over 2000's level, while increasing vehicle trips during the peak hour by only 7 percent
- Adopt 2020 target mode splits for internal and external travel

4.14.1.10 Planned Transportation System Improvements

This section describes planned transportation improvements not related to the implementation of the 2005 LRDP. Transportation improvements associated with the 2005 LRDP are described below in Section 4.14.2.1.

On-Campus and Campus Access Traffic Improvements

A new traffic signal was installed in March 2005 at the intersection of Glenn Coolidge Drive and Hagar Drive. The intersection of Empire Grade Road and Heller Drive has also met signal warrants and a signal is also planned for this location. No other traffic improvements are planned in the near term.

On-Campus Transit Improvements

UC Santa Cruz recently completed the UC Santa Cruz Comprehensive Transit Study (Urbitran 2004b). This report recommends a number of capital and service improvements to accommodate the short and

long-term estimated growth in transit ridership. These improvements are described in Section 4.14.1.11, below.

Off-Campus Transportation System Improvements

City of Santa Cruz. The following projects are identified in the City of Santa Cruz' five-year Capital Improvement Program (City of Santa Cruz Department of Public Works 2005) for near-term construction.

- High Street Bikeway Project – Installation of permanent contraflow bikeway on High Street from Highland Avenue to Storey Street
- Laurel Street Safety Improvements – Installation of left-turn protection at Chestnut Street, Center Street, and Pacific Avenue, and restricted left-turn and through movement from Cedar Street
- State Highway 1/Swift Street Intersection Improvements – Installation of a second left-turn lane from State Highway 1 to Swift Street. In addition, signal modification and median reconstruction is planned
- Swift Street/Delaware Avenue Intersection Improvements – Installation of a roundabout or other improvement is planned

The following future projects are anticipated to be funded through gas tax and grant funds, but are not included in the City's current Capital Improvement Program.

- Bay Street/Escalona traffic signal – Installation of a new traffic signal on Bay at Escalona to improve traffic safety. Expected to be funded through grant funds
- Mission Street/Bay Street improvements – Design and environmental review of intersection improvements to add a dedicated second left-turn lane and through/right turn lane on Bay Street, eliminate split-phasing (where each intersection approach moves separately), add a right-turn lane on Mission Street to northbound Bay Street. Signal modifications would be required, as well as relocation of a bus stop. Improvement includes widening on Bay Street to extend lanes

Planned Regional Improvements. The following projects are planned by the Santa Cruz County Regional Transportation Commission:

Highway 1/SR 17 Interchange. Caltrans, the Santa Cruz County Regional Transportation Commission, and the Federal Highway Administration (FHA) propose improvements to the Highway 1/SR 17 Interchange. The plans include adding lanes and reconstructing bridges. These improvements are identified in the 2005 RTP constrained project list; however, there is no specific timeline for this project and the project will be funded between 2005 and 2030.

Highway 1 High Occupancy Vehicle (HOV) Lanes. Caltrans plans include widening Highway 1 to six lanes from Morrissey Boulevard in Santa Cruz to Larkin Valley/San Andreas Road in Aptos. The additional lanes would serve as HOV lanes in the commute hours and would be available to carpools, express buses, and emergency vehicles.

4.14.1.11 Proposed Transit Improvements in the UC Santa Cruz Vicinity

The UC Santa Cruz Comprehensive Transit Study (Urbitran 2004b) analyzed existing and future conditions of the transit system available on campus, including modifications to both the UC Santa Cruz Campus Transit system and to the METRO bus system. The following summarizes the study's recommendations, some of which have already been implemented.

- UC Santa Cruz Loop Route Campus Transit – Implemented in fall 2004, the Loop Route replaced the Day Perimeter route on the main campus, thereby improving cross-campus travel times, eliminating layovers, and increasing overall operational capacity
- UC Santa Cruz Campus Transit – Larger buses have been recommended for the Loop route
- UC Santa Cruz revise routing of the Day Core and Core Campus Transit – Some route revisions have been instituted in relation to changing ridership demand patterns
- UC Santa Cruz Campus Bike Shuttle – Add third vehicle when demand warrants, and extend service hours
- Long Marine Lab Shuttle – Modify route to increase ridership
- METRO – Vary schedules by day of the week (as with Campus Transit) to better accommodate irregular class schedule
- METRO Routes 15/16/20 – Proposed changes to routes and headways based on utilization

In addition, the Urbitran Study proposes that SCMTD consider potential new services between the main campus and Aptos, Watsonville, and San Jose

4.14.1.12 Existing Operational Analysis

Intersection Study Locations

Existing conditions at 42 on- and off-campus study intersections were evaluated for the LRDP EIR. These intersections were selected based on either (1) their location in key corridors accessing the campus, (2) their location in key corridors serving a citywide function, or (3) because they were identified for evaluation in other UC Santa Cruz traffic studies or in scoping comments. The study intersections are shown in Figure 4.14-5, *Study Intersection Locations.*

On-Campus Intersections. The on-campus study intersections are listed in Table 4.14-4.

Table 4.14-4
On-Campus Intersections

#	Intersection
1	Glenn Coolidge Drive / Campus Facilities
2	Glenn Coolidge Drive / Hagar Drive
3	Hagar Drive / East Remote Lot Entrance
4	Hagar Drive / McLaughlin Drive
5	Heller Drive / McLaughlin Drive
6	Heller Drive / Meyer Drive
43	Glenn Coolidge Drive / East Remote Lot Entrance*
44	McLaughlin Drive / Chinquapin Road
45	Cave Gulch / Heller – North Loop*

Note:
*Intersection proposed in 2005 LRDP.

Off-Campus Intersections. The off-campus study intersections are listed in Table 4.14-5.

Table 4.14-5
Off-Campus Intersections

#	Intersection	#	Intersection
7	Highway 1 / Western Drive	25	Mission Street / Almar-Younglove Avenue
8	Empire Grade Road / Western Drive	26	Mission Street / Swift Street
9	Empire Grade Road / Heller Drive	27	Delaware Avenue / Almar Avenue
10	Bay Street / Glenn Coolidge Drive - High Street	28	Swift Street / Delaware Avenue
11	Bay Street / Nobel-Iowa Drive	29	Lincoln Street / Chestnut Street
12	Bay Street / Escalona Drive	30	Highland Avenue / High Street
13	Bay Street / King Street	31	Laurel Street / Chestnut Street
14	Mission Street / Bay Street	32	River Street / Water Street
15	Bay Street / California Street	33	Ocean Street / Water Street
16	West Cliff Drive / Bay Street	34	Branciforte Avenue / Water Street
17	Mission Street / Laurel Street	35	Morrissey Boulevard / Water Street
18	Mission Street / Walnut Avenue	36	Capitola Road / Soquel Avenue
19	Mission Street / King Street-Union Street	37	Ocean Street / Soquel Avenue
20	Mission Street / Chestnut Street	38	Seabright Avenue / Soquel Avenue
21	Highway 1 / River Street	39	Laurel Street / San Lorenzo Boulevard
22	High Street / Storey Street	40	Murray Street / Seabright Avenue
23	King Street / Storey Street	41	High Street / Laurent Street
24	Mission Street / King Street (West)	42	Empire Grade Road / Cave Gulch*

Note:
*Intersection proposed in 2005 LRDP.

Existing Traffic Counts

Peak-hour turning movement counts[4] for the study intersections were conducted in October/November of 2003 and May 2004 during the on-campus peak hours (data from Fehr & Peers 2003 and 2004). Figures 4.14-6a-6c, *Existing Conditions Intersection Geometry*, show the existing lane configurations at each study intersections, and Figures 4.14-7a–7c, *Existing Conditions Intersection Volumes*, show the peak hour volumes.

Level of Service Methodology

Level of service (LOS) is a measure of the quality of the overall operating characteristics of a street or highway. It is defined in terms of control delay, which considers vehicle waiting time in intersections and travel delays along streets as a gauge of travel time, traffic conflicts and interruptions, freedom to maneuver and driving convenience and comfort. Level of service is dependent upon traffic volume and composition of traffic.

LOS is a measure of congestion that ranges from LOS A (free-flow condition) to LOS F (highly congested condition). The LOS calculations utilize the 2000 Highway Capacity Manual methodology (Transportation Research Board 2000, Chapter 10) for signalized intersections. Table 4.14-6 summarizes the relationship between the level of service rating for signalized intersections and the average control delay per vehicle.

Table 4.14-6
Level of Service Definitions for Signalized Intersections

Level of Service	Average Control Delay Per Vehicle (Seconds)	Description
A	≤ 10.0	Operations with very low delay occurring with favorable progression and/or short cycle length.
B	10.1 to 20.0	Operations with low delay occurring with good progression and/or short cycle lengths.
C	20.1 to 35.0	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
D	35.1 to 55.0	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.
E	55.1 to 80.0	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	> 80.0	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

Source: Transportation Research Board, *Highway Capacity Manual* 2000.

Notes:

Cycle length refers to the time (in seconds) for traffic signal to complete a cycle of green indications for all movements.

Cycle failure refers to conditions when traffic congestion reaches a level where some vehicles cannot pass through the intersection in one or more cycles.

[4] Number of cars making various turns at an intersection during the traffic peak hours.

The evaluation of unsignalized intersections also relies on the operations method of the 2000 Highway Capacity Manual. For two-way stop-controlled intersections, the average control delay for the worst approach is reported. For all-way stop-controlled intersections, the weighted average delay[5] for the entire intersection is reported. The LOS definitions used for unsignalized intersections are summarized in Table 4.14-7.

The current City of Santa Cruz General Plan (General Plan Circulation Element, October 1994) has a policy to maintain intersections at a peak hour LOS of D or better (Policy 5.1.2). In 2005, the City prepared a Draft Traffic Impact Fee Study which recommends a LOS D at most intersections within the City. It also recommends LOS E during the PM peak hour as the acceptable level of service for City intersections in the Central Core Area, from Downtown to the Beach Area. This area is bordered by Highway 1, Chestnut Street, Ocean Street and the beach.

Table 4.14-7
Level of Service Definitions for Unsignalized Intersections

Level of Service	Average Control Delay Per Vehicle (Seconds)
A	≤ 10
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.0

Source: Transportation Research Board, *Highway Capacity Manual* 2000.

Caltrans, which has jurisdiction over Mission Street (Highway 1), SR 9 and SR 17, has established statewide guidelines for level of service. The guidelines strive to maintain a level of service at the threshold between LOS C and D, but acknowledge that this may not always be feasible. Caltrans recognizes the existing demands of the Mission Street corridor and its location in the urbanized portion of the City, and has historically acceded to the City's use of LOS D for the corridor.

The on-campus intersections are subject to the campus LOS standards. These standards reflect the different characters of the lower campus and central campus areas. The lower campus features traffic speeds between 25 and 35 mph or more, and minimal pedestrian activity. The central campus roadways feature numerous stop-controlled intersections, traffic speeds of 25 mph or less, and significant numbers of pedestrians. The lower campus is predominately rural in character, with roadways functioning like arterials connecting to the central campus. In contrast, the central campus is predominately pedestrian in character, with roadways serving to convey vehicles to parking lots and buildings. This difference in character supports the application of lower LOS standards in the central campus (Higgins Associates 1999). The campus standard is LOS D at the following intersections in the lower campus: Glenn Coolidge Drive/Campus Facilities, Glenn Coolidge Drive/Hagar Drive, and Hagar Drive/East Remote parking lot. In contrast, the standard is LOS E at the following intersections in the central campus: Heller

[5] Weighted average is defined as the average vehicle delay experienced at each intersection approach. The average is weighted by the volume of traffic using each approach.

Drive/McLaughlin Drive, Heller Drive/Meyer Drive, McLaughlin Drive/Chinquapin Drive and Hagar Drive/McLaughlin Drive.

Existing Intersection Levels of Service

Intersection LOS. Table 4.14-8 shows the existing LOS for the on-campus intersections based on traffic counts conducted in 2003 and 2004, and Table 4.14-9 show the LOS for the off-campus intersections, both under existing conditions.

Table 4.14-8
Existing Intersection Levels of Service – On-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	Fall 2003	
					Delay (sec)	LOS
1	Glenn Coolidge Drive / Campus Facilities	Signal	AM PM	D	9.4 8.7	A A
2	Glenn Coolidge Drive / Hagar Drive[a]	Signal	AM PM	D	15.0 26.9	B C
3	Hagar Drive / East Remote Lot Entrance	TWSC	AM PM	D	10.7 22.7	B C
4	Hagar Drive / McLaughlin Drive	AWSC	AM PM	E	14.7 31.3	B D
5	Heller Drive / McLaughlin Drive	AWSC	AM PM	E	10.0 15.0	A C
6	Heller Drive / Meyer Drive	AWSC	AM PM	E	14.4 21.7	B C
44	McLaughlin Drive / Chinquapin Drive	AWSC	AM PM	E	9.4 12.9	A B

Notes:

TWSC – Two-Way Stop-Controlled

AWSC – All-Way Stop-Controlled

(a) A traffic signal was installed at the intersection of Glenn Coolidge Drive and Hagar Drive in March 2005. The service levels reported assume the traffic signal in place, but use traffic counts collected prior to the installation of the signal.

Table 4.14-9
Existing Intersection Levels of Service – Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	Fall 2003 / Spring 2004	
					Delay (sec)	LOS
7	Highway 1 / Western Drive	Signal	AM PM	D	22.4 21.0	C C
8	Empire Grade Road / Western Drive	TWSC	AM PM	D	26.7 **53.8**	D **F**
9	Empire Grade Road / Heller Drive[a]	TWSC	AM PM	D	16.2 29.0	C D
10	Bay Street / Glenn Coolidge Drive - High Street	Signal	AM PM	D	16.3 19.9	B B
11	Bay Street / Nobel-Iowa Drive	Signal	AM PM	D	11.8 10.8	B B
12	Bay Street / Escalona Drive [a]	TWSC	AM PM	D	**73.3** **60.3**	**F** **F**

Table 4.14-9
Existing Intersection Levels of Service – Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	Fall 2003 / Spring 2004	
					Delay (sec)	LOS
13	Bay Street / King Street	Signal	AM PM	D	10.0 15.3	A B
14	Mission Street / Bay Street	Signal	AM PM	D	38.6 **65.7**	D **E**
15	Bay Street / California Street	TWSC	AM PM	D	18.8 28.9	C D
16	West Cliff Drive / Bay Street	AWSC	AM PM	D	17.5 24.3	C C
17	Mission Street / Laurel Street	Signal	AM PM	D	29.8 35.6	C D
18	Mission Street / Walnut Avenue	Signal	AM PM	D	22.9 18.2	C B
19	Mission Street / King Street-Union Street	Signal	AM PM	D	**85.3** **57.2**	**F** **E**
20	Mission Street / Chestnut Street	Signal	AM PM	E	30.9 33.9	C C
21	Highway 1 / River Street	Signal	AM PM	E	42.3 50.5	D D
22	High Street / Storey Street	AWSC	AM PM	D	15.0 13.8	C B
23	King Street / Storey Street	AWSC	AM PM	D	25.3 32.3	D D
24	Mission Street / King Street (West)	TWSC	AM PM	D	16.3 17.7	C C
25	Mission Street / Almar-Younglove Avenue	Signal	AM PM	D	21.0 26.5	C C
26	Mission Street / Swift Street	Signal	AM PM	D	23.5 23.8	C C
27	Delaware Avenue / Almar Avenue	AWSC	AM PM	D	9.6 10.8	A B
28	Swift Street / Delaware Avenue	AWSC	AM PM	D	11.8 11.0	B B
29	Lincoln Street / Chestnut Street	AWSC	AM PM	D	11.9 10.5	B B
30	High Street / Highland Avenue*	AWSC	AM PM	D	30.0 **110.0**	D **F**
31	Laurel Street / Chestnut Street*	Signal	AM PM	D	11.9 10.3	B B
32	River Street / Water Street*	Signal	AM PM	D	27.9 38.5	C D
33	Ocean Street / Water Street*	Signal	AM PM	D	37.2 41.0	D D
34	Branciforte Avenue / Water Street*	Signal	AM PM	D	30.1 51.9	C D
35	Morrissey Boulevard / Water Street*	Signal	AM PM	D	33.9 29.8	C C

Table 4.14-9
Existing Intersection Levels of Service – Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	Fall 2003 / Spring 2004	
					Delay (sec)	LOS
36	Capitola Road / Soquel Avenue*	Signal	AM PM	D	26.1 38.5	C D
37	Ocean Street / Soquel Avenue*	Signal	AM PM	D	31.0 33.6	C C
38	Seabright Avenue / Soquel Avenue*	Signal	AM PM	D	24.2 29.9	C C
39	Laurel Street / San Lorenzo Boulevard*	Signal	AM PM	D	12.2 9.2	B A
40	Murray Street / Seabright Avenue*	Signal	AM PM	D	39.3 53.0	D D
41	High Street / Laurent Street	AWSC	AM PM	D	31.9 20.0	D C

Notes:

TWSC – Two-Way Stop-Controlled

AWSC – All-Way Stop-Controlled

* Counted in Spring 2004

(a) These intersections have been found to meet warrants for the installation of traffic signals, but signals have not yet been installed. The reported levels of service are based on unsignalized conditions.

(b) PM peak hour LOS reflect stop signs placed in support of a contra-flow bike lane.

Bold font in the last two columns indicates significant delay and unacceptable LOSs.

Signal Warrant Analysis. Signal warrant analyses, which are studies to determine whether a traffic signal is needed to improve intersection safety or congestion, were conducted for unsignalized intersections operating at LOS E or LOS F under existing conditions. The *Caltrans Manual on Uniform Traffic Control Devices for Streets and Highways* (2003 and 2004) signal warrant analysis methodology was used to evaluate unsignalized intersections at which traffic counts were conducted in fall 2003. The unsignalized off-campus intersections operating at LOS E or F include Empire Grade Road/Western Drive, Bay Street/Escalona Drive, and High Street/Highland Avenue. The results found that a traffic signal is warranted during the AM peak hour at Bay Street/Escalona Drive. The intersection of Empire Grade Road and Heller Drive meets the peak hour warrant for a traffic signal. The all-way stop-controlled intersection of High Street/Laurent Street does not meet warrants for installation of a traffic signal. This intersection does not meet Caltrans' warrants for all-way stop–control, indicating that conversion to two way stop control is justified (Higgins Associates 2005).

The fall 2003 study also included left-turn channelization warrant analysis at two-way stop-controlled intersections operating at LOS E or worse that did not include a left-turn lane. One intersection, Bay Street/Escalona Drive, met the criteria for a left-turn channelization warrant.

4.14.2 Impacts and Mitigation Measures

The 2005 LRDP allows for an enrollment of 21,000 full-time equivalent students, an increase of about 6,950 students over 2004-05 enrollment. Supporting this level of enrollment is a projected faculty and staff totaling about 5,594 plus an estimated 700 non-University employees, construction workers and

visitors that would be on the campus each day. The 2005 LRDP designates land to provide on-campus housing to accommodate 50 percent of undergraduate students, 25 percent of graduate students, 25 percent of faculty, and 3 percent of staff. The project as defined for the transportation analysis in this EIR comprises this growth in student, faculty and staff population and associated transportation and physical infrastructure, as described below.

Transportation Improvements Proposed Under 2005 LRDP

The 2005 LRDP includes proposed on-campus roadway, parking, pedestrian and bicycle, and transit facility improvements and modifications in support of the campus's growth. These improvements and modifications are described in the following sections.

New Roads. The following roadway extensions or improvements were included in the 1988 LRDP, but were not built. They are continued, with modifications, in the proposed 2005 LRDP:

- An extension of Chinquapin Road north to serve future developed areas north of the campus core. The extension would loop around the northern campus area and connect with a northerly extension of Heller Drive
- An extension of Heller Drive north to connect with the Chinquapin Road extension
- A new access road to Empire Grade Road, providing general, service, and emergency access to the campus's northern growth area. This new road would connect the Heller Drive and Chinquapin Road extensions on campus to Empire Grade Road, at the western edge of the north campus, and would require construction of a bridge over the ravine at Cave Gulch. This road would primarily serve employee housing located in the proposed northern growth area and proposed new campus support facilities, which would be located at the intersection of Empire Grade Road and the new connector road. The connector road to Empire Grade Road is referenced as Cave Gulch Road in the analytical tables in this section
- An extension of Meyer Drive from its existing terminus at the Music Facility to Hagar Drive. This extension, originally included in the 1988 LRDP but never constructed, has been modified to minimize visual impacts from the Great Meadow. Its alignment would bridge two ravines to connect to the Hahn peninsula, providing access to the Hahn Student Services building, McHenry Library, and associated parking areas. The design of the extension, through provision of a vehicular turnaround at the Hahn parking lot, has the flexibility to prohibit private vehicle access, allowing only bicycle and pedestrian, transit, service, and emergency access
- A new connection between Hagar Drive and Glenn Coolidge Drive adjacent to the south side of the East Collector Parking Facility, which was not included in the 1988 LRDP

Additional modifications may include restricting private vehicle use on some campus roadways in the campus core. Hagar Drive between the Meyer Drive extension and McLaughlin Drive may be restricted to transit, service and emergency vehicles, thereby improving the character of this roadway segment for pedestrians and bicyclists. This restriction would be viable only in conjunction with other road modifications noted above. The new east-west connections would improve east-west vehicle circulation

around the campus core, allowing McLaughlin Drive to become more pedestrian-, transit-, and bicycle-oriented and reduce pedestrian, transit and vehicle conflicts at the Quarry Plaza intersection.

For analysis of the impacts from 2005 LRDP-related traffic, future vehicle circulation was modeled with the assumption that the following roadway modifications proposed under the 2005 LRDP would be in place:

- Hagar Drive between the Meyer Drive extension and McLaughlin Drive is closed to public vehicular traffic (disabled access transit, bicyclists, service and emergency vehicles are allowed)
- A new east-west connector is constructed between Hagar Drive and Glenn Coolidge Drive to serve the East Collector Parking Facility
- Meyer Drive extension is closed to public vehicular traffic (transit, bicyclists, service and emergency vehicles are allowed) but allows public vehicular traffic to access the Hahn Peninsula
- North campus loop road is constructed connecting Chinquapin Drive and Heller Drive with a new connection to Empire Grade Road

Figure 3-6, *Transportation Network Improvements,* in Chapter 3, *Project Description* (Volume I) illustrates the campus roadway and circulation system with the 2005 LRDP improvements in place.

Restricting public vehicular traffic on Hagar Drive between Meyer Drive and McLaughlin Drive would redistribute all traffic traveling to and from the campus core and the north campus growth area that would normally use Hagar Drive, to McLaughlin Drive and Glenn Coolidge Drive. This would concentrate more traffic on the north end of Glenn Coolidge Drive and the east end of McLaughlin Drive than if Hagar Drive remained open to general traffic. However, it would not affect traffic levels on McLaughlin Drive west of the Hagar Drive intersection.

The Glenn Coolidge Drive/Hagar Drive connector would provide access to the proposed East Collector Parking Facility from both Hagar and Glenn Coolidge Drives. This would reduce the traffic volume concentration at the Hagar/East Collector Parking Facility intersection.

The north loop road would provide access to the buildings in the north campus growth area of the campus, and to the proposed new connection to Empire Grade Road. The loop road could reduce vehicular traffic on McLaughlin Drive in the campus core because it would divert some traffic before it reached the core. The proposed Empire Grade Road connection has the potential to reduce traffic volume on Heller Drive. It would serve primarily as access to the north campus growth area: for access to lower campus areas this would be a longer route, and would entail out-of-direction travel for those traveling between the campus core and destinations off campus, and thus would be a less desirable route.

During scoping, a commenter expressed concerns about the potential effects of increased campus traffic on Empire Grade Road as a result of construction of the new entrance to the north campus, and of the use of the road by campus vehicles and trucks accessing the proposed campus support facility on Empire Grade Road. In response to scoping comments, the potential effects of increased campus traffic on Empire Grade Road, and of the use of the road by campus vehicles and trucks accessing the campus

support facility at the proposed new campus entrance was specifically considered. The addition of campus trucks to this roads is consistent with its designation as a truck route.[6]

Proposed Parking Facilities

The 2005 LRDP proposes development of approximately 3,100 net new parking spaces. This number represents net growth in parking spaces through development of up to 5,600 new parking spaces and displacement of up to 2,500 existing parking spaces through infill development. With the approximately 5,200 existing parking spaces on campus, and the net new 3,100 spaces that could be added under the proposed 2005 LRDP, there would be up to about 8,300 total parking spaces on campus by 2020. Under the proposed 2005 LRDP, while limited parking would continue to be provided in the campus core for critical access needs (i.e. disabled access, service vehicles and deliveries), the number of close-in parking spaces likely would be reduced under the 2005 LRDP due to infill development. Over 1,000 of the new parking spaces proposed would be associated with on-campus housing, while the remainder would serve the general campus population and visitors.

The 2005 LRDP outlines a parking strategy based on "collector" parking facilities located at the periphery of the campus core. These consolidated parking facilities would be served by high-frequency intra-campus transit service and linked to the pedestrian circulation system by new pathways and sidewalks. The collector lot strategy provides a number of benefits including reducing traffic volumes (and conflicts) in the campus core, improving the integration of transit and parking resulting in a more efficient transit system, and consolidating numerous small parking lots into a single facility. This impact analysis assumes the following distribution of potential new parking facilities:

- The East Collector Parking Facility (currently called the East Remote parking lot) would serve as the primary on-campus parking facility and would be expanded. Improved access via the new Glenn Coolidge Drive/Hagar Drive connector road would serve to distribute vehicle traffic and improve peak-hour flows, while its location on the southeast edge of the campus core would serve to "capture" auto traffic outside the Academic Core
- A new parking structure would be constructed in the vicinity of Performing Arts, accessed from Heller or Meyer Drives
- A new parking facility would be located in the north campus growth area
- New parking spaces would be constructed in association with housing developments on the upper campus lands, with access via the extension of Heller Drive and Chinquapin Road
- New parking spaces would be constructed in association with the Family Student Housing Redevelopment Project planned for the existing FSH site, replacing and augmenting spaces presently available at the site

Transit/Shuttle Service. Existing on-campus circulation and the project's proposed parking strategy are dependent on a comprehensive high-frequency, high-capacity transit and shuttle system serving all

[6] Analysis of operations at existing and proposed Empire Grade Road intersections is included in Tables 4.14-16 and 4.14-17, below.

parts of the campus. The 2005 LRDP envisions one large collector parking facility (East Collector) serving as a transit hub where parking, regional transit, and Campus Transit would be linked. The Campus Transit system would be expanded to meet both the projected ridership demand and to utilize the new roadway system. Combining an improved Campus Transit system with a single large parking collection point would provide several benefits to transit:

- The transit staging area (layovers, driver shift changes, etc.) would be shifted away from the pedestrian-oriented Quarry Plaza
- Transit capacity would be concentrated at the location of the highest level of demand (the largest parking facility on the campus)
- Appropriately sized facilities would be provided for transfers between express METRO and Campus Transit services in close proximity to the transit improvements recommended for the lower campus roadway network (see below)

To improve transit movement on campus, the 2005 LRDP considers strategic implementation of bus queue-jump lanes (allowing buses to bypass vehicular backups at intersections) and transit priority signal systems (where buses can trigger a green light to reduce bus travel time). These improvements would occur primarily on the lower campus roadways (e.g., the Glenn Coolidge Drive/Hagar Drive intersection), but could also be implemented at key intersections on McLaughlin Drive.

Pedestrian and Bicycle Circulation. Pedestrian circulation improvements envisioned in the proposed 2005 LRDP are focused in the campus core on two primary pedestrian spines, the network of paths that connect individual colleges to each other and to academic buildings, and new paths connecting the campus core to new development on the north campus lands. Infill development of new facilities is intended to reinforce the pedestrian spines, and improve pedestrian connectivity and safety with the construction of new paths and new pedestrian bridges to cross roadways and steep terrain. Sidewalks and paths adjoining the new roadways described above would also provide new pedestrian connections.

The 2005 LRDP emphasizes the need to address pedestrian conflicts on McLaughlin Drive through a combination of traffic calming, pedestrian safety improvements, and potentially, grade-separated pedestrian crossings at critical locations. The closure of Hagar Drive to private motor vehicles between the Meyer Drive Extension and McLaughlin Drive, under the 2005 LRDP, would improve roadway conditions for bicycle and pedestrian traffic along this corridor.

The 2005 LRDP includes the provision of Class II bike lanes (striped bike lanes) on the new Chinquapin/Heller loop road extension in both directions; and in the uphill direction of Heller Drive from Empire Grade Road to McLaughlin Drive, and on Hagar Drive from the East Collector Facility entrance to McLaughlin Drive. Bike lanes are also proposed on the existing Meyer Drive, the Meyer Drive extension, and on the entire length of McLaughlin Drive, as width permits.

The sections that follow describe impacts that would result from campus growth under the 2020 LRDP. Because the 2005 LRDP is a long-range plan, programmatic impacts for the 2005 LRDP are evaluated for the year 2020, the planning horizon year by which the 2005 LRDP anticipates that the projected 21,000 student enrollment would be reached. Components of the 2020 LRDP (e.g., individual buildings and

facilities) would be implemented over time, and the potential environmental impacts of each of these individual projects will be evaluated separately. 2005 LRDP programmatic impacts are analyzed by adding traffic from the full development of the campus under the 2005 LRDP to projected future traffic volumes in the region in 2020, and determining the change in future traffic conditions as a result of the additional 2005 LRDP-related traffic.

4.14.2.1 Standards of Significance

The following standards of significance are based on Appendix G of the CEQA Guidelines. For the purposes of this EIR, an impact to transportation/traffic would be considered significant if the proposed project would:

- Cause an increase in the traffic that is substantial in relation to the existing traffic load and capacity of the street system (as indicated by LOS standards for congestion at intersections)
- Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways
- Substantially increase hazards due to a design feature or incompatible uses
- Result in inadequate parking capacity
- Conflict with applicable adopted policies, plans, or programs supporting alternative transportation

4.14.2.2 CEQA Checklist Items Not Applicable to the Project

- Result 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
- Result in inadequate emergency access

The proposed 2005 LRDP has no potential to affect air traffic patterns, and neither the main campus nor the 2300 Delaware Avenue property is within an air safety zone that would require restrictions on development. Potential impacts with respect to emergency access are addressed in Section 4.6.3, *Hazards and Hazardous Materials* (Volume I).

4.14.2.3 Significance Thresholds

The following thresholds were used in this section to evaluate whether the project would cause an increase in traffic that is substantial in relation to the traffic load and the capacity of the street system. Note that there are no designated congestion management program facilities in the project study area.

Campus Intersections. LOS D is the minimum acceptable LOS for UC Santa Cruz for intersections in the lower campus and LOS E is the minimum acceptable LOS for intersections in the central and north campus.

City of Santa Cruz Intersections. According to the City of Santa Cruz, a project would result in a significant adverse effect on traffic conditions at an intersection if any of the following criteria are met:

- The peak hour level of service (LOS) at a signalized intersection degrades from an acceptable level to an unacceptable level due to the increase in traffic generated by the proposed project and the project increases the traffic volume by more than three percent, or
- The project increases the traffic volume by more than three percent at a signalized intersection that already operates at an unacceptable level without the project, or
- An unsignalized intersection meets the Caltrans peak hour signal warrant with the addition of project-generated traffic and the project increases the traffic volume by more than 3 percent.

The minimum acceptable LOS for the City of Santa Cruz for most city streets and intersections during the PM peak hours is LOS D. The acceptable level of service for city streets and intersections in the city's Central Core Area from Downtown to the Beach Area during the PM peak hour is LOS E. This area is bordered by Highway 1, Chestnut Street, Ocean Street and the beach. The acceptable level of service for Mission Street, Ocean Street, Riverside Street, Beach Street, Front Street from Soquel Avenue to Beach Street, Soquel Avenue from Ocean Street to Front Street, Barson Street from Ocean Street to Riverside Street, and the intersections on those streets during weekend peak hours is LOS E.

Caltrans Facilities. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities. However, Caltrans acknowledges that this may not always be feasible, and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State Highway facility is operating at less than the appropriate target LOS, the existing level of service should be maintained (Caltrans 2002). As noted earlier, Caltrans has historically acceded to the City's use of LOS D for the SR-1 (Mission Street) corridor. Therefore, this EIR uses the City's threshold for Highway 1 / Mission Street intersections.[7]

4.14.2.4 Analytical Method

Project Trip Generation

Project trip generation consists of the growth in traffic on the main campus with implementation of the 2005 LRDP, including occupation of the 2300 Delaware Avenue site, which is caused by the increase in population and employment anticipated by the year 2020. Daily and peak hour trips for the 2020 LRDP conditions under the 2005 LRDP are calculated on the basis of trip generation rates derived from current traffic counts on the campus, adjusted as follows. Rates were derived separately for students, and faculty and staff. A 6 percent downward adjustment was applied to the existing campus trip generation rates for students to reflect the proposed 2005 LRDP's higher level of on-campus student housing compared to existing level (50 percent for undergraduates compared to 44 percent in 2003-04, and 25 percent for

[7] Caltrans has questioned the application of the City's standards to Mission Street (Highway 1) intersections in its comments on the Shaffer Road/Pacific Shores Apartments Draft EIR prepared for the City (2001). The City defended its standards in its responses to comments in the Final EIR. UC Santa Cruz contacted both parties and attempted to resolve the discrepancy in approach, but did not succeed. This report, therefore, uses the City threshold (as has been the historic practice in University planning documents)(UC Santa Cruz Marine Science Campus LRDP Draft EIR 2003).

graduate students). Trip generation estimates for the campus in 2020 conditions are shown in Table 4.14-10. In 2020, the campus is estimated to generate a total of 2,010 AM peak hour, 2,764 PM peak hour, and 34,173 daily trips. When existing trips (2003-04) are subtracted from this total, the growth in traffic due to implementation of the 2005 LRDP would be 558 AM peak hour, 724 PM peak hour, and 9,343 daily trips. This growth in trips reflects the project as analyzed in this EIR.

The project trip generation also includes the proposed occupancy of 2300 Delaware Avenue by University operations. The occupation of this existing facility is fully evaluated at a project level in Volume III of this EIR, and is also included in the 2020 analysis as a component of the 2005 LRDP. Trip estimates for the 2300 Delaware Avenue site are also shown in Table 4.14-10. Operations at this site are estimated to generate a total of 271 AM peak hour trips, 311 PM peak hour trips, and 1,782 daily trips.[8] The traffic analysis includes trips between the 2300 Delaware Avenue site and the main campus. About 30 percent of the peak hour trip generation of the 2300 Delaware Avenue site is conservatively attributed to travel to and from the main campus. The loading docks at the 2300 Delaware Avenue site are estimated to generate about 105 truck trips per day, with about 16 trips made between 2300 Delaware Avenue and the main campus by smaller single-unit delivery trucks. These trucks would be required under the proposed project to use Bay Street to access the main campus and traffic analysis is based on use of that route.

Trip generation estimates for the 2300 Delaware Avenue site use different rates for the site's different components. Rates that best reflect the type of use were selected for the estimates of trips. Trip generation for the administrative components of Buildings A and B are based on general office rates from the Institute of Transportation Engineers' *Trip Generation Manual* (2003). These rates are based on the building's square footage. Trip generation for the research labs in Building C are based on research and development center rates from the ITE trip generation manual, which use the assignable square footage of the lab space. Trip generation for the receiving docks and printing facility were derived based on the description of the facilities' operation and anticipated deliveries, customers, and employees, as provided in Chapter 4, *2300 Delaware Avenue Project* (see Volume III).

Project Trip Distribution

The trip distribution pattern for the proposed project was determined using the Association of Monterey Bay Area Governments (AMBAG) travel demand forecasting model developed in 2005. Project trips (generated by both the main campus and the 2300 Delaware Avenue site) were distributed to external gates (roadways at the perimeter of the study area such as Routes, 1 and 17, Empire Grade Road north, etc.) and to internal zones within the City of Santa Cruz. Figure 4.14-8, *Project Trip Distribution,* illustrates the distribution pattern assumed for on- and off-campus LRDP-related trips. As described above, 30 percent of the peak hour trips generated by the 2300 Delaware site are assumed to travel to and from the main campus. The remaining trips are assigned to the external "gates" (to the regional travel routes) and the internal Santa Cruz zones shown in Figure 4.14-8.

[8] The campus population totals include the employees who would work at 2300 Delaware Avenue, and therefore the trips associated with this site are included in the total reported in Table 4.14-10. The trips associated with 2300 Delaware Avenue are reported separately in Table 4.14-10 to allow for these trips to be distributed differently on the street network than the trips associated with the growth at the main campus.

Table 4.14-10
Estimated Project Trip Generation (Year 2020)

	Campus Population under the 2005 LRDP	AM Peak Trips			PM Peak Trips			Daily Trip
		In	Out	Total	In	Out	Total	Generation
Main Campus Trip Generation								
Actual Trip Counts in 2003-04		**1,149**	**303**	**1,452**	**828**	**1,212**	**2,040**	**24,830**
Students	21,000	1,232	347	1,579	869	1,303	2,172	26,846
UC employees	4,702	293	83	376	207	310	517	6,395
Non-UC Employees	250	16	4	20	11	17	28	340
Construction Workers	200	12	4	16	9	13	22	272
Visitors	250	15	4	19	10	16	26	320
Total Population/Trips in 2020	26,402	1,568	442	2,010	1,106	1,659	2,765	34,173
Main Campus Growth (2003/04 to 2020)		**419**	**139**	**558**	**278**	**447**	**725**	**9,343**
Trips from Main Campus to 2300 Delaware [a]		15	67	82	75	18	93	535
Adjusted Main Campus Growth (2003/04 to 2020) [a]		**404**	**72**	**476**	**203**	**429**	**632**	**8,808**
2300 Delaware Avenue Trip Generation								
		AM Peak Hour			PM Peak Hour			Daily Trip
Facility Use/Building	**Size**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Generation**
Admin Staff (Bldg. A & B)	57.0 KSF	78	11	89	14	71	85	630
Research Staff (Bldg. C)	92.0 KSF	95	19	114	15	84	99	746
Receiving Docks (Bldg. C)		20	15	34	15	20	34	145
Printing Facility (Bldg. C)	12.0 KSF	30	4	34	16	77	93	261
Total 2300 Delaware Avenue Trips		**223**	**49**	**271**	**60**	**252**	**311**	**1,782**
Trips from 2300 Delaware to Main Campus [a]	30%	67	15	82	18	75	93	535
Total Trip Generation (Main Campus + 2300 Delaware) [a]		**627**	**121**	**747**	**263**	**681**	**943**	**10,590**

Source: Main campus trip generation is from rates derived from existing campus gate counts. 2300 Delaware Avenue site trip generation derived from the following: administrative staff trip generation is based on Institute of Transportation Engineers' (ITE) rates for general office (7th Edition), research lab rates are from ITE Research and Development Center, and receiving dock and printing facility trip generation derived by Kimley-Horn and Associates, Inc.

Note:

(a) The total trip generation for the main campus and 2300 Delaware Avenue reflects the interchange of trips between the two sites. It is estimated that 30% of the 2300 Delaware Avenue trips are to/from the Main Campus; therefore, the Main Campus trips are adjusted to reflect this interaction. Trips "In" to the 2300 Delaware Avenue facility would be trips "Out" of the Campus and vice versa. These trips were assigned to the routes between the 2300 Delaware property and the main campus that they would affect, rather than being distributed over the City and regional road network. The total trip generation is the summation of the Adjusted Main Campus Growth and the Total 2300 Delaware Avenue Trips.

2020 Without LDRP Project Conditions

2020 without 2005 LRDP conditions (hereinafter 2020 Without LRDP Project scenario) represent traffic volumes and levels of service projected to exist in 2020 without the implementation of the 2005 LRDP. The AMBAG travel demand model was used to derive traffic volumes, which includes the roadway networks and land uses in Santa Cruz County, San Benito County, Monterey County, and portions of Santa Clara County. The AMBAG model also provides traffic volume forecasts for the years 2000, 2010, 2020, and 2030, based on population and employment forecasts developed by AMBAG.

In order to represent the 2020 Without LRDP Project scenario but maintain the 2020 non-campus projections, the 2020 UC Santa Cruz campus population, employment, and student enrollment projections were established at the model's 2000 level. This adjustment results in 2020 forecasts without any growth

on the campus, which is the 2020 Without LRDP Project scenario. Additional adjustments made to the model include reducing the employment at the 2300 Delaware Avenue site (which the model assumes contains non-university employment), and adding additional retail employment to reflect the proposed home improvement center in the west side of Santa Cruz.

Traffic volumes for 2020 Without LRDP Project scenario were estimated using growth factors derived from the AMBAG travel demand model. These growth factors were derived by Kimley-Horn by comparing traffic growth between the 2000 and modified 2020 model forecasts for each major roadway in the study area and calculating an annual growth rate. The annual growth rates (representing 17 years of growth) were applied to 2003 and 2004 traffic counts to derive 2020 intersection turning movement projections for 2020 Without LRDP Project scenario.

The 2020 Without LRDP Project scenario also includes the estimated traffic generated by the approved Coastal Long Range Development Plan (CLRDP) for the UC Santa Cruz Marine Science Campus. This traffic was manually added to the 2020 Without LRDP Project intersection volumes.

2020 Without LRDP Project Intersection Operational Analysis. Intersection LOS calculations were conducted to evaluate intersection operations in 2020 under the Without LRDP Project scenario. Figure 4.14-9a-c, *2020 Without Project Intersections Volumes*, shows the 2020 Without LRDP Project intersection turning movement volumes for the on- and off-campus intersections. Table 4.14-11 shows the on-campus intersection level of service and Table 4.14-12 shows the off-campus intersection level of service analysis for the 2020 Without LRDP Project scenario. The corresponding level of service worksheets are included in Appendix E, Volume II of this EIR.

Table 4.14-11
2020 Without LRDP Project – Levels of Service at On-Campus Intersections

#	Intersection	Type of Control	Peak Hour	Campus LOS Standard	2020 Without LRDP Project	
					Delay (sec)	LOS
1	Glenn Coolidge Drive / Campus Facilities	Signal	AM PM	D	9.4 8.7	A A
2	Glenn Coolidge Drive / Hagar Drive	TWSC	AM PM	D	9.9 10.8	A B
3	Hagar Drive / East Remote Lot	TWSC	AM PM	D	9.2 10.7	A B
4	Hagar Drive / McLaughlin Drive	AWSC	AM PM	E	11.1 19.1	B C
5	Heller Drive / McLaughlin Drive	AWSC	AM PM	E	8.4 9.8	A A
6	Heller Drive / Meyer Drive	AWSC	AM PM	E	9.2 10.4	A B
43	Glenn Coolidge Drive / East Collector	TWSC	AM PM	D	N/A	N/A
44	McLaughlin Drive / Chinquapin Drive	AWSC	AM PM	E	8.5 10.2	A B
45	Cave Gulch / Heller-North Loop	TWSC	AM PM	--	N/A	N/A

Notes: TWSC – Two-Way Stop-Controlled AWSC – All-Way Stop-Controlled N/A – Not Applicable.
Intersections have not been constructed and do not exist under the 2020 Without LRDP Project scenario.

Table 4.14-12
2020 Without LRDP Project– Levels of Service at Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	City LOS Standard	2020 Without LRDP Project	
					Delay (sec)[1]	LOS
7	Highway 1 / Western Drive	Signal	AM PM	D	25.1 29.5	C C
8	Empire Grade Road / Western Drive	TWSC	AM PM	D	**60.3** **215.4**	**F** **F**
9	Empire Grade Road / Heller Drive	TWSC	AM PM	D	18.6 46.7	C E
10	Bay Street / Glenn Coolidge Drive - High Street	Signal	AM PM	D	17.0 21.6	B C
11	Bay Street / Nobel-Iowa Drive	Signal	AM PM	D	12.2 11.6	B B
12	Bay Street / Escalona Drive [a]	Signal	AM PM	D	14.1 7.6	B A
13	Bay Street / King Street	Signal	AM PM	D	11.5 15.6	B B
14	Mission Street / Bay Street [b]	Signal	AM PM	D	**64.2** **111.6**	**E** **F**
15	Bay Street / California Street	TWSC	AM PM	D	33.8 **105.9**	D **F**
16	West Cliff Drive / Bay Street	AWSC	AM PM	D	30.5 **57.3**	D **F**
17	Mission Street / Laurel Street	Signal	AM PM	D	42.7 **79.4**	D **E**
18	Mission Street / Walnut Avenue	Signal	AM PM	D	41.0 21.8	D C
19	Mission Street / King Street-Union Street	Signal	AM PM	D	**158.2** **109.2**	**F** **F**
20	Mission Street / Chestnut Street	Signal	AM PM	E	76.3 72.8	E E
21	Highway 1 / River Street	Signal	AM PM	E	77.7 **107.2**	E **F**
22	High Street / Storey Street	AWSC	AM PM	D	17.3 15.4	C C
23	King Street / Storey Street	AWSC	AM PM	D	**45.8** **59.9**	**E** **F**
24	Mission Street / King Street (West)	TWSC	AM PM	D	26.4 **42.6**	D **E**
25	Mission Street / Almar-Younglove Avenue	Signal	AM PM	D	24.0 49.4	C D
26	Mission Street / Swift Street	Signal	AM PM	D	27.1 28.2	C C
27	Delaware Avenue / Almar Avenue	AWSC	AM PM	D	17.0 **43.2**	C **E**
28	Swift Street / Delaware Avenue	AWSC	AM PM	D	**114.0** **63.3**	**F** **F**

Table 4.14-12
2020 Without LRDP Project– Levels of Service at Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	City LOS Standard	2020 Without LRDP Project	
					Delay (sec)[1]	LOS
29	Lincoln Street / Chestnut Street	AWSC	AM PM	D	17.1 14.4	C B
30	High Street / Highland Avenue	AWSC	AM PM	D	**58.9** **183.1**	**F** **F**
31	Laurel Street / Chestnut Street	Signal	AM PM	D	20.9 16.8	C B
32	River Street / Water Street	Signal	AM PM	D	28.1 46.1	C D
33	Ocean Street / Water Street	Signal	AM PM	D	38.6 44.1	D D
34	Branciforte Avenue / Water Street	Signal	AM PM	D	33.2 **66.1**	C **E**
35	Morrissey Boulevard / Water Street	Signal	AM PM	D	**65.8** 48.0	**E** D
36	Capitola Road / Soquel Avenue	Signal	AM PM	D	27.9 **60.1**	C **E**
37	Ocean Street / Soquel Avenue	Signal	AM PM	D	31.4 35.5	C D
38	Seabright Avenue / Soquel Avenue	Signal	AM PM	D	27.2 55.0	C D
39	Laurel Street / San Lorenzo Boulevard	Signal	AM PM	D	13.1 10.7	B B
40	Murray Street / Seabright Avenue	Signal	AM PM	D	**108.3** **150.7**	**F** **F**
41	High Street / Laurent Street	AWSC	AM PM	D	28.0 31.0	D D
42	Empire Grade Road / Cave Gulch	TWSC	AM PM	D	N/A	N/A

Notes:

TWSC – Two-Way Stop-Controlled
AWSC – All-Way Stop-Controlled

N/A – Not Applicable. Intersections have not been constructed and do not exist under the 2020 Without LRDP Project scenario.
(a) This intersection has been found to meet warrants for the installation of a traffic signal. The City has included signalization of Bay/Escalona under its gas tax/grant funded planned improvements.
(b) The intersection of Mission/Bay Street is assumed to be improved per the City's gas tax/grant funded improvement list.

Bold font indicates that the intersection does not meet LOS standard.

Off-Campus Intersections

Under the 2020 Without LRDP Project scenario, many of the off-campus study intersections are projected to operate at acceptable levels of service. However, the intersections shown in Table 4.14-13 are projected to operate at unacceptable LOS E or F during at least one of the peak hours.

Table 4.14-13
2020 Without LRDP Project-Intersections with Unacceptable LOS

#	Intersection	Operation
8	Empire Grade Road / Western Drive	LOS F during both AM and PM peak hours
13	Bay Street / King Street	LOS E during PM peak hour
14	Mission Street / Bay Street	LOS F during PM peak hours and E during AM peak hours
15	Bay Street / California Street	LOS F during PM peak hour
16	West Cliff Drive / Bay Street	LOS F during PM peak hour
17	Mission Street / Laurel Street	LOS E during PM peak hour
19	Mission Street / King Street-Union Street	LOS E during AM peak hour and F during PM peak hours
21	Highway 1 / River Street	LOS F during PM peak hours
23	King Street / Storey Street	LOS E during AM peak hour and LOS F during PM peak hour
24	Mission Street / King Street	LOS E during PM peak hour
27	Delaware Avenue / Almar Avenue	LOS E during PM peak hour
28	Swift Street / Delaware Avenue	LOS F during both AM and PM peak hours
30	High Street / Highland Avenue	LOS F during both AM and PM peak hours
34	Branciforte Avenue / Water Street	LOS E during PM peak hour
35	Morrissey Boulevard / Water Street	LOS E during AM peak hour
36	Capitola Road / Soquel Avenue	LOS E during PM peak hour
40	Murray Street / Seabright Avenue	LOS F during both AM and PM peak hours

2020 with LRDP Project Intersection Operational Analysis. Analysis of the on-campus intersection conditions under the proposed 2005 LRDP (hereinafter 2020 with LRDP Project) required changes in the distribution and assignment of traffic relative to current patterns. The proposed 2005 LRDP includes changes to existing roads and would add new roads that would change on-campus travel patterns. These would include restricting general vehicular access on Hagar Drive between Meyer Drive and McLaughlin Drive (requiring traffic accessing the north campus to use either Heller Drive or Glenn Coolidge Drive), implementation of the Glenn Coolidge Drive/Hagar Drive connector providing multiple access points to the East Collector Parking Facility, implementation of the north campus loop road, and

implementation of the new access road to Empire Grade Road. These roadway changes would affect the distribution of campus traffic, which is reflected in the on-campus analysis.

Existing lane geometry and traffic control, as illustrated in Figure 4.14-6a-c, were used in the 2020 with LRDP Project analysis. The 2020 With LRDP Project turning movement volumes for the on- and off-campus intersections are shown in Figure 4.14-10a-c, *2020 With Project Intersection Volumes*. The LOS calculations for the on-campus study intersections under 2020 with LRDP Project scenario are summarized in Table 4.14-14, and the off-campus intersection LOS analysis for the 2020 with LRDP Project scenario are shown in Table 4.14-15. Both tables compare the project conditions to 2020 without LRDP Project conditions. The corresponding LOS worksheets are included in Appendix E. Table 4.15-15 also identifies whether the project would cause a significant impact based on the standards of significance described above.

Table 4.14-14
2020 with LRDP Project – Levels of Service at On-Campus Intersections

#	Intersection	Type of Control	Peak Hour	Campus LOS Standard	2020 Without LRDP Project		2020 With LRDP Project	
					Delay (sec)	LOS	Delay (sec)	LOS
1	Glenn Coolidge Drive / Campus Facilities	Signal	AM PM	D	9.4 8.7	A A	19.2 13.1	B B
2	Glenn Coolidge Drive / Hagar Drive	Signal	AM PM	D	9.9 10.8	A B	11.5 14.5	B B
3	Hagar Drive / East Collector	TWSC	AM PM	D	9.2 10.7	A B	9.4 11.8	A B
4	Hagar Drive / McLaughlin Drive	AWSC	AM PM	E	11.1 19.1	B C	12.3 24.1	B C
5	Heller Drive / McLaughlin Drive	AWSC	AM PM	E	8.4 9.8	A A	8.6 10.5	A B
6	Heller Drive / Meyer Drive	AWSC	AM PM	E	9.2 10.4	A B	10.2 11.8	B B
43	Glenn Coolidge Drive / East Collector	TWSC	AM PM	D	N/A	N/A	12.3 16.4	B C
44	McLaughlin Drive / Chinquapin Drive	AWSC	AM PM	E	8.5 10.2	A B	9.1 11.4	A B
45	Empire Grade Road / New Campus Access	TWSC	AM PM	--	N/A	N/A	9.3 9.8	A A

Notes:
TWSC – Two-Way Stop-Controlled
AWSC – All-Way Stop-Controlled
N/A – Not Applicable. Intersections have not been constructed and do not exist under the 2020 Without LRDP Project scenario.

Table 4.14-15
2020 with LRDP Project – Levels of Service at Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	2020 Without Project		2020 With Project (LRDP)		Project % of Total Traffic	Met Signal Warrant Analysis	Significant Impact
					Delay (sec)	LOS	Delay (sec)	LOS			
7	Highway 1 / Western Dr	Signal	AM PM	D	25.1 29.5	C C	28.1 39.2	C D	- -		NO NO
8	Empire Grade Road / Western Dr	TWSC	AM PM	D	**60.3** **215.4**	**F** **F**	**198.2** **672.1**	**F** **F**	16% 17%	YES YES	YES YES
9	Empire Grade Rd / Heller Dr	TWSC	AM PM	D	18.6 46.7	C E	25.4 171.3	D F	 18%	NO YES	NO YES
10	Bay St-Glenn Coolidge Dr / High St	Signal	AM PM	D	17.0 21.6	B C	20.4 32.9	C C	- -		NO NO
11	Bay St / Nobel-Iowa Dr	Signal	AM PM	D	12.2 11.6	B B	11.5 11.7	B B	- -		NO NO
12	Bay St / Escalona Dr [a]	TWSC	AM PM	D	14.1 7.6	B A	21.6 11.1	C B	- -	- -	NO NO
13	Bay St / King St	Signal	AM PM	D	11.5 15.6	B B	13.8 30.6	B D	- -		NO NO
14	Mission St / Bay St [b]	Signal	AM PM	D	**64.2** **111.6**	**E** **F**	**92.0** **164.8**	**E** **F**	9% 10%		YES YES
15	Bay St / California St	TWSC	AM PM	D	33.8 **105.9**	D **F**	**39.4** **131.1**	**E** **F**	3% 4%	YES YES	NO YES
16	West Cliff Dr / Bay St	AWSC	AM PM	D	30.5 **57.3**	D **F**	32.3 **68.3**	D **F**	- 3%	- YES	NO NO
17	Mission St / Laurel St	Signal	AM PM	D	42.7 **79.4**	D **E**	54.8 **110.7**	D **F**	- 8%		NO YES
18	Mission St / Walnut Ave	Signal	AM PM	D	41.0 21.8	D C	43.2 23.3	D C	7% -		NO NO
19	Mission St / King St-Union St	Signal	AM PM	D	**158.2** **109.2**	**F** **F**	**187.4** **157.7**	**F** **F**	5% 9%		YES YES
20	Mission St / Chestnut St	Signal	AM PM	E	76.3 72.8	E E	**110.3** **97.6**	**F** **F**	6% 7%		YES YES
21	Highway 1 / River St	Signal	AM PM	E	77.7 **107.2**	E **F**	**81.6** **124.3**	**F** **F**	4% 5%		YES YES
22	High St / Storey St	AWSC	AM PM	D	17.3 15.4	C C	19.9 16.3	C C	- -	- -	NO NO
23	King St / Storey St	AWSC	AM PM	D	**45.8** **59.9**	**E** **F**	**55.6** **114.2**	**F** **F**	7% 14%	YES YES	YES YES
24	Mission St / King St (West)	TWSC	AM PM	D	26.4 **42.6**	D **E**	**35.3** **60.9**	**E** **F**	9% 9%	YES NO	YES NO
25	Mission St/ Almar-Younglove Ave	Signal	AM PM	D	24.0 49.4	C D	24.4 **63.5**	C **E**	- 7%		NO YES
26	Mission St / Swift St	Signal	AM PM	D	27.1 28.2	C C	28.0 31.6	C C	- -		NO NO

Table 4.14-15
2020 with LRDP Project – Levels of Service at Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	2020 Without Project		2020 With Project (LRDP)		Project % of Total Traffic	Met Signal Warrant Analysis	Significant Impact
					Delay (sec)	LOS	Delay (sec)	LOS			
27	Delaware Ave/ Almar Ave	AWSC	AM PM	D	17.0 **43.2**	C **E**	18.3 **50.5**	C **F**	- 2%	- -	NO NO
28	Delaware Ave / Swift St	AWSC	AM PM	D	**114.0** **63.3**	**F** **F**	**126.9** **76.6**	**F** **F**	2% 3%	YES YES	NO NO
29	Lincoln St / Chestnut St	AWSC	AM PM	D	17.1 14.4	C B	17.3 14.5	C B	- -	- -	NO NO
30	Highland Ave / High St	AWSC	AM PM	D	**58.9** **183.1**	**F** **F**	**104.1** **219.4**	**F** **F**	11% 5%	NO NO	NO NO
31	Laurel St / Chestnut St	Signal	AM PM	D	20.9 16.8	C B	32.3 21.0	C C	- -		NO NO
32	River St / Water St	Signal	AM PM	D	28.1 46.1	C D	28.0 47.9	C D	- -		NO NO
33	Ocean St / Water St	Signal	AM PM	D	38.6 44.1	D D	39.2 44.9	D D	- -		NO NO
34	Branciforte Ave / Water St	Signal	AM PM	D	33.2 **66.1**	C **E**	33.5 **66.6**	C **E**	- 1%		NO NO
35	Morrissey Blvd/ Water St	Signal	AM PM	D	**65.8** 48.0	**E** D	**67.8** 49.1	**E** D	0% -		NO NO
36	Capitola Road/ Soquel Ave	Signal	AM PM	D	27.9 **60.1**	C **E**	28.0 **60.0**	C **E**	- 0%		NO NO
37	Ocean St / Soquel Ave	Signal	AM PM	D	31.4 35.5	C D	31.4 35.6	C D	- -		NO NO
38	Seabright Ave/ Soquel Ave	Signal	AM PM	D	27.2 55.0	C D	27.3 **55.4**	C **E**	- 0%		NO NO
39	Laurel St / San Lorenzo Blvd	Signal	AM PM	D	13.1 10.7	B B	13.7 10.9	B B	- -		NO NO
40	Murray St / Seabright Ave	Signal	AM PM	D	**108.3** **150.7**	**F** **F**	**111.1** **153.2**	**F** **F**	1% 1%		NO NO
41	High Street / Laurent Street	AWSC	AM PM		28.0 31.0	D D	**52.6** **58.3**	**F** **F**	9% 11%	NO NO	NO NO
42	Empire Grade Road / Cave Gulch	TWSC	AM PM		N/A	N/A	11.4 10.5	B B	- -	- -	NO NO

Notes:

TWSC – Two-Way Stop-Controlled
AWSC – All-Way Stop-Controlled

N/A – Not Applicable. Intersections have not been constructed and do not exist under 2020 Without LRDP Project scenario. Signal Warrant Analysis was only performed on unsignalized intersections operating below the LOS standard with a project percent of total traffic greater than 3%.

(a) This intersection has been found to meet warrants for the installation of a traffic signal. The City has included signalization of Bay/Escalona under its gas tax/grant funded planned improvements.

(b) The intersection of Mission/Bay is assumed to be improved per the City's gas tax/grant funded improvement list.

Bold font indicates an unacceptable LOS.

4.14.2.5 2005 LRDP Impacts and Mitigation Measures

LRDP Impact TRA-1: Campus growth under the 2005 LRDP would cause an increase in on-campus traffic that could result in unacceptable levels of service at two on-campus intersections if the growth in traffic outpaces the modifications to the on-campus circulation system proposed under the 2005 LRDP.

Significance: Potentially significant

LRDP Mitigation TRA-1: The Campus shall monitor the level of service at two intersections (Hagar Drive/McLaughlin Drive and Heller Drive/Meyer Drive) every three years beginning in 2007, and implement intersection improvements or signalization as needed to maintain an acceptable level of service.

Residual Significance: Less than significant

With the growth in campus population under the 2005 LRDP, additional vehicle trips would be added to campus roadways. Furthermore, the 2005 LRDP includes new roads and changes to existing circulation patterns to adequately serve projected growth. As shown in Table 4.14-16, increases in traffic under the 2005 LRDP can be accommodated by the proposed on-campus circulation system without significantly affecting levels of service at on-campus intersections. Therefore, with the proposed roadway improvements included in the 2005 LRDP, campus growth would not degrade the level of service at the on-campus study intersections and the impact would be less than significant.

However, if the growth in campus traffic due to implementation of the 2005 LRDP occurs at a faster pace than the proposed improvements to the road network, the following three on-campus intersections are projected to operate at unacceptable levels (LOS E or F) with the addition of project traffic to the 2020 Without LRDP Project conditions:

- Intersection 3: Hagar Drive / East Collector Parking Facility (LOS F during PM peak hour)
- Intersection 4: Hagar Drive / McLaughlin Drive (LOS F during PM peak hour)
- Intersection 6: Heller Drive / Meyer Drive (LOS F during PM peak hour)

Note that LOS impact at the Hagar/East Collector Parking Facility intersection would result only if the proposed new connector road were not built at the time that the proposed expansion of the East Collector Lot occurs. TAPS envisions that this connector road would be built in conjunction with the East Collector Lot expansion and transit hub implementation; thus, it is unlikely that this intersection would degrade to an unacceptable level.

If the road and circulation improvements proposed under the 2005 LRDP were not implemented, signalization or other intersection improvements would be required at these intersections in order to maintain acceptable levels of service. Implementation of LRDP Mitigation TRA-1 would reduce potential intersection impacts to a less-than-significant level.

LRDP Impact TRA-2: Campus growth under the 2005 LRDP would cause unacceptable levels of service at 11 off-campus intersections.

Significance: Significant

LRDP Mitigation TRA-2A: UC Santa Cruz shall review capital projects proposed under the 2005 LRDP as part of the environmental clearance process to determine if the additional traffic generated by the proposed projects would trigger the need for the specific intersection improvements listed in Table 4.14-17, or other improvements to achieve the City's level of service standards. If the analysis indicates that, with the project's traffic contribution, the levels of service would degrade to unacceptable levels, the Campus shall inform the City of this conclusion, and contribute its "fair share" (as defined below) of the cost of the needed improvements.

LRDP Mitigation TRA-2B: UC Santa Cruz shall expand its existing Transportation Demand Management programs with the objectives of increasing sustainable transportation modes (use of modes other than single-occupant vehicles) above 55 percent during the planning horizon of the 2005 LRDP and reducing peak hour traffic volumes. Potential measures that the Campus will consider for achieving this objective are listed in Table 4.14-18.

Residual Significance: Significant and unavoidable

The implementation of the 2005 LRDP would add vehicle-trips to off-campus study intersections. Based on City of Santa Cruz's significance criteria, in order for a project's impact to be considered significant at a signalized intersection, project-level increases in traffic must be more than 3 percent of the total traffic at an intersection that is degraded to an unacceptable level of service or if an unsignalized intersection experiences project-level increase more than 3 percent and meets warrants for installation of a traffic signal. Table 4.14-16 presents all off-campus study intersections projected to operate at unacceptable levels of service (LOS E or F) under the 2020 With LRDP Project scenario. The third column identifies those intersections where the 2005 LRDP-related peak hour traffic would contribute more than 3 percent to the intersection traffic volumes, resulting in a significant impact at these intersections. The fourth column indicates the percentage of increased traffic that would be attributable to growth under the proposed 2005 LRDP.

Table 4.14-16
Off-Campus Intersections under 2020 With LRDP Project Scenario

#	Intersection	Operation	2005 LRDP Significant Impact	Project Contribution (%) at Significantly Affected Intersections
8	Empire Grade Road / Western Drive	LOS F during both AM and PM peak hours	YES	16% AM 17% PM
9	Empire Grade Road / Heller Drive	LOS F during the PM peak hour	YES	18% PM
14	Mission Street / Bay Street	LOS E during AM peak hour and LOS F during PM peak hour	YES	9% AM 10% PM
15	Bay Street / California Street	LOS E during AM peak hour and LOS F during PM peak hour	YES	3% AM 4% PM
16	West Cliff Drive / Bay Street	LOS F during PM peak hour	NO	
17	Laurel Street / Mission Street	LOS F during PM peak hour	YES	8% PM
19	King Street-Union Street / Mission Street	LOS F during both AM and PM peak hours	YES	5% AM 9% PM
20	Mission Street / Chestnut Street	LOS F during both AM and PM peak hours	YES	6% AM 7% PM
21	Highway 1 / River Street	LOS F during both AM and PM peak hours	YES	4% AM 5% PM
23	Storey Street / King Street	LOS F during both AM and PM peak hours	YES	7% AM 14% PM
24	King Street (west)/ Mission Street	LOS E during AM peak hour and LOS F during PM peak hour	YES	9% AM 9% PM
25	Mission Street / Almar-Younglove Avenue	LOS E during PM peak hour	YES	7% PM
27	Delaware Avenue / Almar Avenue	LOS F during PM peak hour	NO	
28	Delaware Avenue / Swift Street	LOS F during both AM and PM peak hours	NO	
30	High Street / Highland Avenue	LOS F during both AM and PM peak hours	NO	
34	Branciforte Avenue / Water Street	LOS E during PM peak hour	NO	
35	Morrissey Boulevard / Water Street	LOS E during AM peak hour	NO	
36	Capitola Road / Soquel Avenue	LOS E during PM peak hour	NO	
38	Seabright Avenue / Soquel Avenue	LOS E during PM peak hour	NO	
40	Murray Street / Seabright Avenue	LOS F during both AM and PM peak hours	NO	
41	High Street / Laurent Street	LOS F during both AM and PM peak hours	NO	

Notes: Table lists all intersections that would operate at unacceptable levels of service under 2020 with LRDP Project scenario. Fourth column indicates a significant impact due to the project, and last column shows the project's traffic as percent of total traffic volumes at the significantly affected intersections.

See Appendix E for traffic counts and other data related to intersection LOS.

The evaluation above is based on the projected increase in the three-quarter-average enrollment from about 14,050 FTE students in 2003 to about 21,000 FTE students in 2020, and associated increase in campus employees and other populations. The Campus is also proposing to expand its summer programs and anticipates that the summer quarter enrollment will increase from about 1,650 students in 2003 to a maximum of 8,100 students by 2020, an increase of about 6,450 students over current summer program levels. This increase of about 6,450 students during the summer quarter is lower than the average increase during the school year quarter (about 6,950 students). The employee population of the campus in the summer quarter would be slightly lower than the three-quarter average. Therefore, even with the expanded summer programs, the total daily and peak-hour traffic associated with the campus during the summer quarter would actually be lower than the daily and peak-hour traffic in the school year quarters, and the traffic impacts would be expected to be lower than the impacts during the rest of the year that are reported above in Table 4.14-16.

However, Santa Cruz is a summer destination for tourists, and summer time traffic volumes in some portions of the city can be considerably higher than the volumes during other times of the year. To determine whether the traffic associated with the additional summer quarter students could result in a level of service impact because campus traffic would cumulate with the summer visitor traffic, data on current summer time intersection volumes were obtained from the City of Santa Cruz for the study intersections. These summer time intersection volumes were compared to the average intersection volumes used in the analysis above. The comparison revealed that the summer time volumes exceeded the average volumes at 14 of the 45 study intersections. Of the 14 intersections where the summer traffic volumes were higher, only four intersections (Intersection Numbers 21, 33, 36, and 37) had summer traffic volumes that were more than 5 percent higher than the average volumes. Because the difference in volumes at 10 intersections is less than 5 percent and the increase in student population during the summer months is less than the increase during the rest of the year by about 500 students, the addition of project-related traffic at these intersections would not result in a significant impact.

With respect to the four intersections where the summer traffic volumes were substantially greater than the average, the ratio of summer time traffic volumes to the average traffic volumes was used to increase the 2020 Without LRDP Project traffic volumes to reflect 2020 summer time conditions. These increased volumes were then used to calculate the LOS under both With the LRDP and Without the LRDP Project conditions. The results of the analysis are reported in Table 4.14-17 below.

Table 4.14-17
2020 With LRDP Project – Levels of Service at Off-Campus Intersections (Summer Quarter)

#	Intersection	Type of Control	Peak Hour	LOS Standard	2020 Summer Without Project		2020 Summer Plus Project (LRDP)		Project % of Total Traffic	Significant Impact
					Delay	LOS	Delay	LOS		
21	Highway 1/River St	Signal	PM	E	147.4	F	167.8	F	5%	YES
33	Ocean St / Water St	Signal	PM	D	109.6	F	113.7	F	1%	NO
36	Capitola Road/ Soquel Ave	Signal	PM	D	98.2	F	98.1	F	0%	NO
37	Ocean St / Soquel Ave	Signal	PM	D	51.8	D	52.1	D	-	NO

A comparison of the table above with Table 4.14-13 shows that, during the summertime, the LOS at Intersection Numbers 21, 33, and 36 would degrade to a lower level, compared to the LOS during the rest of the year. However, the LRDP-related traffic would form more than 3 percent of the total traffic at only one of the three intersections, Intersection 21. This is one of the 11 intersections that would be significantly affected by the growth under the 2005 LRDP during the rest of the year, as well. Therefore, the summer quarter enrollment increase would not result in a new LOS impact that would not occur from LRDP-related traffic during the school year.

To address the significant impacts on off-campus intersections, in compliance with LRDP Mitigation TRA-2A, the Campus shall evaluate the effect of each capital construction project proposed under the 2005 LRDP that would add new trips on the affected off-campus intersections to determine whether the project would trigger the need for an improvement at any of these intersections. If an improvement is triggered, the University shall inform the City of the conclusion that a need for the improvement has been triggered, and contribute its fair share towards the cost of improvements.

In this EIR, "Fair Share" is defined to mean that the University has agreed to negotiate for a contribution to the identified improvement pursuant to procedures similar to those described in Government Code Sections 54999 et seq. for contributions to utilities. In addition, in each case a fair-share payment is agreed upon, the University will pay its fair share only if the applicable jurisdiction has established and implemented a mechanism for collecting funds from any other developers and entities contributing to the identified impacts, and providing that the jurisdiction builds the identified improvements. It should be noted that because of the City of Marina versus California State University lawsuit that is currently pending in the California Supreme Court, there is uncertainty regarding whether the University can legally fund certain off-campus infrastructure improvements that are not within the jurisdiction of the University. Therefore, it is possible the fair share mitigation measures proposed herein may need to be modified in response to the ultimate decision in that case.

Table 4.14-18 below presents the traffic improvements that could be implemented at the affected intersections and the improvement in the levels of service that would be achieved by these traffic improvements. For the unsignalized intersections that would operate at unacceptable levels of service in 2020 under the 2020 With LRDP Project scenario, a signal warrant analysis was prepared based on the peak hour volume warrant, Warrant 3. In most cases, significant impacts at the affected off-campus intersections can be mitigated with improvements, most often by installing a traffic signal. However, these off-campus improvements are outside the jurisdiction of the University.

Table 4.14-18
Potential Improvements

#	Intersection	Improvement	LOS after Improvement	
8	Empire Grade Road / Western Drive	Install traffic signal	AM PM	LOS B LOS B
9	Empire Grade Road / Heller Drive	Install traffic signal	AM PM	LOS B LOS D

Table 4.14-18
Potential Improvements

#	Intersection	Improvement	LOS after Improvement
14	Bay Street / Mission Street	Planned City improvement assumed under 2020 Without LRDP Project and 2020 With LRDP Project scenarios: Re-stripe southbound approach of Bay St. to include a right-turn lane, shared though-left and a dedicated left-turn lane and modify the signal timing as part of implementation of a signal coordination plan.	AM **LOS F** PM **LOS F**
15	Bay Street / California Street	Install traffic signal or a modern roundabout.	AM LOS A PM LOS B
17	Laurel Street / Mission Street	Add a southbound right-turn lane (Mission to Laurel) and modify the signal timing as part of implementation of a signal coordination plan. This improvement requires property acquisition and relocation of the existing sidewalk.	AM LOS D PM LOS D
19	King Street-Union Street / Mission Street	Re-stripe the southbound approach of King Street to include dual left-turn lanes and a shared through-right lane and modify the signal timing of the intersection as part of implementation of a signal coordination plan.	AM **LOS F** PM **LOS F**
20	Mission Street / Chestnut Street	Convert southbound dual right-turn lanes on Mission Street to a single-lane "free" right-turn lane and widen the westbound departure leg of the intersection to accommodate a new 500-foot long third lane for merging, or; Install a triple southbound right-turn lane on Mission Street, which would also require the new merging lane as described above). In both cases, the modifications would require major reconstruction of the intersection, and possibly right-of-way acquisition and building modification/relocation.	AM **LOS F** PM **LOS F**
21	Highway 1 / River Street	Add an eastbound left-turn lane on Highway 1 and modify the signal time, part of implementation of a signal coordination plan.	AM LOS D PM **LOS E**
23	King Street / Storey Street	Install traffic signal and reconfigure southbound approach to provide a left and a right-turn lane.	AM LOS B PM LOS B
24	King Street / Mission Street West	Install traffic signal and modify the signal timing as part of implementation of a signal coordination plan along Mission Street.	AM LOS A PM LOS A
25	Mission Street / Almar-Younglove Avenue	Modify signal timing and phasing, as part of implementation of signal coordination plan.	PM LOS D
28	Swift Street / Delaware Avenue	Install traffic signal or a modern roundabout.	PM LOS B

Note:
(a) Potential off-campus improvements are outside University jurisdiction by may be carried out by others.

The last column in Table 4.14-18 shows that the proposed improvements would improve the level of service to LOS D or better at most of the affected intersections. However at four intersections, Intersection Numbers 14, 19, 20, and 21, even with mitigation the levels of service would remain at E or F during the AM peak hours or PM peak hour or both. In addition, while at Intersection Numbers 19 and 21, with the proposed improvements the remaining delay under the 2020 With LRDP Project scenario would be reduced to be less than the delay under the 2020 Without LRDP Project scenario, at Intersection Numbers 14 and 20, even with the listed improvements the remaining delay under the 2020 With LRDP Project scenario would be greater than the delay under the 2020 Without LRDP Project scenario. Therefore, the impact would be significant and unavoidable at these four intersections. In addition, the feasibility and/or implementation of all of these improvements at the 11 affected intersections cannot be

guaranteed by UC Santa Cruz because the improvements are the responsibility of other jurisdictions, and detailed planning, environmental review, and engineering have not yet been completed. Therefore, UC Santa Cruz must consider this impact significant and unavoidable.

Nonetheless, the Campus will continue to work to address the significant impact of the proposed project on off-campus intersections through implementation of LRDP Mitigation TRA-2B. Pursuant to LRDP Mitigation TRA-2B, UC Santa Cruz shall continue to actively pursue transportation demand management strategies to reduce vehicle trips to and from the campus. Examples of strategies that will be pursued are listed in Table 4.14-19. Implementation Level 1 measures either are ongoing programs or can be implemented in the near term by the Campus. Implementation Level 2 includes some longer-range measures that require major acquisitions of land or partnerships with local or regional agencies. The Campus will continue to pursue these measures and to work with other jurisdictions as needed, and will implement those measures that are feasible within the term of the 2005 LRDP.

Table 4.14-19
Potential Transportation Demand Management Measures

Implementation Level 1	Implementation Level 2
Continue to expand Commuter Vanpool Program.	Replace monthly/annual parking fee with "pay at exit" use-based parking fees that encourage off-peak travel.
Expand Bike Shuttle hours of operation and increase frequency of service, as needed.	Implement reduced on-campus parking fees for arrivals and departures occurring during off-peak hours.
Institute regular shuttle service between Marine Science Campus, 2300 Delaware Avenue and the main campus.	Work with local agencies to implement a series of off-campus bike circulation improvements (bike boulevards, secure bike parking at major transit stops, etc.)
Introduce Carsharing program for staff, faculty and students 21 years of age or older.	Extend Carsharing program to include students 18 years of age or older.
Work with local agencies to provide additional secure bike parking and/or "bike stations" at or near off-campus transit stops.	Consolidate campus meeting facilities in high-access areas of the campus, or establish secondary off-campus meeting facilities.
Institute rideshare campaign to promote carpooling among campus commuters, including UCSC-specific ride-matching program provided by Commute Solutions.	Work with appropriate agencies to identify and develop a Westside Santa Cruz multi-modal hub, to connect Westside shuttle service with expanded automobile and bike parking and (ultimately) regional access via the adjoining rail right-of-way.
Institute "Commuter Counseling" services through the TAPS Sales Office.	Work with appropriate agencies to identify and develop Westside and Eastside Santa Cruz remote Park & Ride facilities with transit service.
Where feasible, implement a 4-day/10 hour or 9-day/80 hour work schedule for staff.	Explore opportunities to construct new student/staff housing along off-campus transit corridors.
Where feasible, promote increased use of telecommuting options for students, staff and faculty.	Work with appropriate agencies to implement ITS program for the Campus Transit system to provide real-time vehicle location and time-to-arrival information at major on-campus bus stops.
	Encourage SCMTD to implement ITS program for the Campus Transit system to provide real-time vehicle location and time-to-arrival information at major bus stops on- and off-campus.

The TDM measures described above would be beneficial with respect to reducing local intersection impacts, and would support technologies and goals of sustainable transportation, consistent with the sustainable transportation guidelines recently adopted by The Regents (2005).

In addition to the mitigation measures proposed above, an alternative "Eastern Access" route to the campus was also evaluated as a potential mitigation measure to address LOS impacts to off-campus intersections. This route would begin at River Street in the vicinity of the Highway 1/17/9 junction, and extend northwest through the Pogonip City Park to a new eastern entrance to the UC Santa Cruz campus on Glenn Coolidge Drive. The Eastern Access could serve either as a general access roadway or as a dedicated transitway. Both options were evaluated for their ability to avoid or reduce LOS impacts of campus growth at study area intersections.

Traffic modeling indicates that an Eastern Access would most benefit those traveling to/from the campus from southern Santa Cruz County (Highway 1), from Highway 17, and from some parts of the east side of Santa Cruz. The Eastern Access would divert between 25 percent and 40 percent of the projected total main campus traffic (depending on peak period and direction) away from Mission Street, High Street, and Bay Streets, primarily onto River Street (Highway 9) where the Eastern Access would connect.

Out of the 11 intersections that would be significantly affected by campus growth under the 2005 LRDP, traffic at seven intersections would change as a result of diversion of traffic to the Eastern Access. Table 4.14-20 presents the changes in LOS and average vehicular delay that would result under the two Eastern Access options at the seven intersections within the Mission, High, and Bay Street corridors.

Table 4.14-20
2020 With Project Intersection Levels of Service With and Without Eastern Access

#	Intersection	Control	Peak Hour	2020 Without LRDP Project		2020 With LRDP Project		2020 LRDP With General Vehicular Eastern Access		2020 LRDP With Eastern Access Transitway	
				Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
14	Mission St / Bay St [a]	Signal	AM	64.2	**E**	92.0	**E**	64.3	**E**	86.4	**F**
			PM	111.6	**F**	164.8	**F**	106.1	**F**	158.1	**F**
15	Bay St / California St	TWSC	AM	33.8	D	39.4	**E**	35.6	**E**	39.5	**E**
			PM	105.9	**F**	131.1	**F**	109.4	**F**	131.6	**F**
17	Mission St / Laurel St	Signal	AM	42.7	D	54.8	D	43.5	D	53.2	D
			PM	79.4	**E**	110.7	**F**	78.5	**E**	107.2	**F**
19	Mission St / King St-Union St	Signal	AM	158.2	**F**	187.4	**F**	145.1	**F**	171.3	**F**
			PM	109.2	**F**	157.7	**F**	92.6	**F**	140.5	**F**
20	Mission St / Chestnut St	Signal	AM	76.3	**E**	110.3	**F**	64.1	**E**	90.4	**F**
			PM	72.8	**E**	97.6	**F**	56.1	**E**	87.5	**F**
21	Highway 1 / River St	Signal	AM	77.7	**E**	81.6	**F**	146.5	**F**	96.9	**F**
			PM	107.2	**F**	124.3	**F**	163.8	**F**	134	**F**
23	King St / Storey St	AWSC	AM	45.8	**E**	55.6	**F**	38	**E**	47.6	**E**
			PM	59.9	**F**	114.2	**F**	24.2	C	79.4	**F**

Notes:

TWSC – Two-Way Stop-Controlled
AWSC – All-Way Stop-Controlled
(a) The intersection of Bay/Mission is assumed to be improved per the City's gas tax/grant funded improvement list.

Bold font indicates substandard LOS.

The analysis shows that as a general access roadway, the Eastern Access would eliminate the increased traffic that would be added to the affected study intersections by campus growth under the 2005 LRDP. As Table 4.14-20 shows, it would divert enough traffic to improve intersection average delay at four of the intersections to a level better than 2020 Without LRDP Project conditions, effectively eliminating the significant impact of the LRDP-related traffic. At the remaining three intersections, it would reduce the delay compared to the 2020 with LRDP Project condition, but would not divert enough traffic to remove all the delay added by the proposed LRDP. However, except at one intersection (King Street/Storey Street where the LOS would improve from F to C in the PM peak hour), the Eastern Access as a general access roadway would not improve intersection LOS from unacceptable to acceptable at the affected intersections. As expected, shifting traffic to the Eastern Access would exacerbate intersection operations at the intersection of Highway 1/River Street and result in substantial degradation of intersection delay and LOS.

An Eastern Access transitway would be a roadway exclusively for use by public transit and would provide a new access point to UC Santa Cruz at the campus's eastern boundary, traversing a steep grade to connect with Glenn Coolidge Drive near the East Collector Parking Facility. The transitway would be accessed from Highway 9 (River Street) in the vicinity of Vernon Street. As an exclusive transit facility, the transitway would likely require an accompanying park and-ride facility for users who would arrive by car. Previous studies (Daisa 2005) indicated that the Eastern Access would include a 150-space surface park-and-ride lot near the River Street terminus of the route. A multi-level structure on a lot of this size would provide about 450 parking spaces. This larger number of spaces would provide better capacity to feed a transitway system. A transfer center might also be needed at the site for those who arrive by bus, if the transitway were served by a fixed guideway system.

A traffic analysis of an Eastern Access transitway assessed the benefits of shifting LRDP-related traffic that would ordinarily access the campus via Mission, Bay or High Streets to the Eastern Access park-and ride-facility. The amount of traffic that would be shifted is assumed to be equal to the trip generation of the potential 450-space parking facility serving the transitway. The estimated trip generation of the conceptual park and ride facility is derived from the existing trip generation of the existing East Remote parking lot on campus. The envisioned park and ride facility, thus is estimated to generate about 240 trips in the AM peak hour, 200 trips in the PM peak hour, and about 3,900 trips daily. This traffic would be diverted away from the Mission, Bay, and High Street corridors by an Eastern Access transitway.

As shown in Table 4.14-19, a transitway on the Eastern Access route would be less effective in reducing traffic on significantly affected intersections than would a general vehicular roadway. The transitway would provide some noticeable improvements to intersection delay when compared to the 2020 With LRDP condition, but would not eliminate any significant impacts by improving the LOSs to acceptable levels. Like the general access roadway option, the transitway option would exacerbate congestion at the intersection of Highway 1/River Street.

In summary, an Eastern Access general access roadway would eliminate the traffic contribution of the proposed 2005 LRDP at several key intersections and would result in improvements to key corridors, including Mission Street, High Street, and Bay Street. However, it would not divert enough traffic to result in an improvement to intersection LOS, and nearly all of the affected intersections would still

continue to operate at a LOS E or F. As a transitway, an Eastern Access would benefit campus traffic and transit users between south County and Highway 17, and reduce the LRDP's traffic contribution at the affected intersections, but would not divert enough traffic to result in an improvement to the levels of service of key intersections.

Based on these assessments of an Eastern Access as an alternative mitigation measure, it is concluded that the Eastern Access would provide only marginal benefits within the 2005 LRDP planning horizon. While an Eastern Access would decrease seconds of delay at several intersections, it would not improve levels of service at intersections affected by 2020 traffic, irrespective of the addition of traffic that would be contributed by implementation of the 2005 LRDP. Furthermore, the Eastern Access would require construction through a city park, which would require approval from the City. Because the Eastern Access would provide only minimal traffic improvements, and these improvements would not reduce traffic impacts to below City of Santa Cruz standards of significance, and because implementation would be outside of the jurisdiction of the University, an Eastern Access is not recommended as a mitigation measure at this time. However, the Campus would work cooperatively with the City should there be a desire to pursue this option in the future.

LRDP Impact TRA-3: If the development of planned parking does not keep pace with other growth on campus, or if parking supply is reduced as a result of development on existing parking lots, campus growth under the 2005 LRDP could generate demand for parking in excess of on-campus parking capacity.

Significance: Potentially significant

LRDP Mitigation TRA-3A: The Campus shall implement LRDP Mitigation TRA-2B TDM measures to reduce on-campus parking demand associated with single-occupant vehicle commuters and with long-term storage of infrequently used vehicles.

LRDP Mitigation TRA-3B: The Campus shall monitor on-campus parking utilization rates annually, and will construct additional parking when demand approaches capacity. The Campus will use projected average daytime utilization rate in excess of 90 percent in a given parking zone as a measure of parking capacity.

LRDP Mitigation TRA-3C: The Campus shall continue to enhance existing parking management systems to maximize utilization of existing parking capacity. Parking capacity enhancements may include real-time monitoring of lot utilization, changeable message signs identifying available parking spaces, use-based parking permits, zoned parking permits, or other measures.

Residual Significance: Less than significant

Currently, the main campus has 5,222 automobile parking spaces. This includes 4,840 spaces under the control of the TAPS parking management program and 382 "non-inventoried" spaces, associated with on-campus family student and employee housing that are not managed by TAPS. These spaces are distributed among permit spaces (65 percent), reserved spaces for critical close-in parking such as disabled, service, loading and visitor parking (17 percent), housing (9 percent), and unimproved automobile spaces (2 percent). Current utilization among inventoried parking spaces (based on 2004 surveys[9]) shows an average daily occupancy of 3,702 spaces, which represent a 76 percent occupancy rate, or a parking ratio of 0.211 occupied spaces per campus population (students, faculty, and staff). The current ratio of supply of parking spaces to campus population is 0.297 spaces.

As described above, the 2005 LRDP identifies a number of possible locations for parking facilities and includes land adequate in area for the construction of up to 5,600 new spaces, with the assumption that up to 2,500 existing spaces would be displaced through infill development. There would therefore be an increase of up to 3,100 net new spaces under the proposed 2005 LRDP. The additional net new parking developed under the proposed 2005 LRDP, added to the existing parking inventory on campus, thus, would provide up to about 8,300 total parking spaces on campus.

The LRDP-projected parking need was based on the assumption that these parking ratios would be applied to all on-campus student apartments and employee housing sites, and that additional parking would be provided for existing housing sites currently operating with lower parking ratios, based on an analysis of parking ratios for individual types of parking (e.g., reserved, critical close-in, visitor, housing, etc.). Although a scoping comment was received that requested consideration of a development alternative that did not include new parking, no such alternative for campus development has been proposed. Existing parking ratios on campus are already quite low (about 0.297 spaces per person), in part because Campus parking has been managed deliberately to encourage the use of alternative transportation. Further reductions in parking ratios could result in inadequate parking supply for the proposed population and development on campus. However, since the 2005 Draft LRDP was published, Campus Housing and TAPS have reassessed the parking need for existing housing based on actual parking utilization rates and concluded that, with implementation of the proposed 2005 LRDP, additional new parking would not be needed for existing housing developments. The current projections indicate the need for a total of 7,868 auto parking spaces on campus in 2020,[10] which represents an increase of about 2,700 net new spaces beyond the current parking supply, rather than the 3,100 net new spaces projected in the proposed 2005 LRDP. Nonetheless, up to 3,100 net new automobiles parking spaces could be built, if needed, under the proposed 2005 LRDP, and this is the number used for environmental impacts analyses in this EIR

In addition to the auto spaces available on campus, the campus provides approximately 330 motorcycle parking spaces distributed throughout campus parking areas. Many of these motorcycle spaces are located at the end of a row of auto spaces where the pavement area is inadequate to accommodate an auto parking space. The scattered distribution of these motorcycle parking spaces, combined with relatively low motorcycle use at UC Santa Cruz (the Spring 2004 Modal Mix Study indicates less than 1 percent

[9] Based on parking space inventory conducted during the Spring 2004 Parking Utilization Survey. Parking utilization determined as daytime average occupancy measured Monday-Thursday at mid-morning and mid-afternoon.
[10] 7,868 parking spaces on campus would result in an overall parking ratio of 0.301 provided spaces per person on campus.

motorcycle mode share) has led to relatively low utilization of existing designated motorcycle parking. The 2004 parking utilization survey found less than 21 percent of all motorcycle parking spaces occupied. Based on these low utilization rates, the projected supply of on-campus motorcycle parking spaces may be reduced over time to approximately half the current number. However, spaces maintained in the inventory would be better designed and located in future parking areas, to improve motorcycle parking on campus relative to existing conditions.

Parking on campus is strictly controlled and enforced through the distribution of permits and restrictions. Ongoing transportation demand management programs have been effective, and future measures are expected to further reduce single occupant vehicle parking demand. Therefore, the total parking supply under the 2005 LRDP will be adequate to meet demand in 2020 and, in fact, the number of spaces included in the Draft 2005 LRDP may not be needed in 2020, as noted above. However, because additional parking might not be constructed with each new building project, and because building projects may displace existing parking, demand could exceed supply at some time during the term of the 2005 LRDP. The implementation of LRDP Mitigations TRA-3A and TRA-3B would provide for management of on-campus parking supply to ensure that the supply keeps pace with demand during campus growth. Consideration of a multi-modal transit hub in the City of Santa Cruz was requested during scoping for this EIR. As part of the implementation of augmented TDM measures referenced under LRDP Mitigation TRA-2B, and to further the reduction of parking demand, as noted above, the Campus would continue to work with appropriate off-campus agencies to identify a location for and develop a Santa Cruz Westside multi-modal hub, which would provide off-campus parking with transit links to campus.

Apart from the concern related to temporary shortfalls in parking, several other existing problems with campus parking are expected to continue and potentially could increase as the campus population increases under the 2005 LRDP. Students, and visitors to the campus who are not familiar with the location of campus parking facilities, may circulate throughout the campus unnecessarily as they search for parking. This utilizes campus roadway capacity and potentially increases conflicts with other modes of transportation. To address this issue, the Campus will implement LRDP Mitigation TRA-3C to improve the management of the parking supply allowed under the 2005 LRDP.

Another ongoing parking problem on campus, which may be exacerbated by growth under the 2005 LRDP, is that students, faculty and staff who live on campus may park infrequently-used private vehicles on campus lots. These long-term parked vehicles (“stored vehicles”) utilize parking spaces that could be used by daily commuters, and thus increase the need for on-campus parking. LRDP Mitigation TRA-2B includes TDM measures such as a Carshare program that may reduce the need for campus residents to bring a personal vehicle to Santa Cruz, and an initiative for the University to work with other jurisdictions to explore development of long and short-term off-campus parking lots. These measures would help to ensure that parking is not built unnecessarily to meet an artificially inflated demand. The implementation of these measures would reduce this potential parking impact to a less-than-significant level.

In addition to these identified impacts of the proposed 2005 LRDP, the Campus also recognizes that students, faculty and staff may park on the residential streets surrounding the campus, and the demand for parking on these streets may result in inconvenience for local residents. This parking demand has numerous sources. In addition to campus commuters who may park on nearby streets in order to avoid

parking fees or campus residents who may at times "store" their vehicles on these streets, the demand for neighborhood parking by local residents themselves may be high, particularly because many households have multiple cars and limited off-street parking. The proposed 2005 LRDP includes adequate parking supply on campus to meet the demand from the campus and visitor population, as described above, so growth under the LRDP will not place new parking demands on surrounding streets. The City of Santa Cruz operates a Residential Parking Permit program for the neighborhoods in the vicinity of the campus, and has expanded and would be expected to continue to expand this program as needed to ensure that residents have access to parking in their neighborhoods. LRDP Mitigation TRA-2B, which is aimed at reducing single-occupant vehicle use and would also address parking storage demand associated with the campus, would also contribute toward diminishing parking inconvenience for neighborhood residents.

LRDP Impact TRA-4: Campus growth under the 2005 LRDP would result in increases in circulation volumes (numbers of pedestrians, bicycles, and transit and other motor vehicles) that would conflict with and reduce the effectiveness of alternative modes of transportation, including transit, bicycle and pedestrian travel.

Significance: Potentially significant

LRDP Mitigation TRA-4A: UC Santa Cruz shall monitor on- and off-campus transit service and other alternative modes of transportation on an annual basis, to assess the need for improvements in campus circulation to accommodate changes in campus-related circulation demands.

LRDP Mitigation TRA-4B: Based on results of LRDP Mitigation TRA-4A, the Campus shall improve the operational efficiency and capacity of the campus transit system as needed to maintain transit cycle time, and shall work with SCMTD and other agencies to maintain and improve efficiency and capacity of the public transit system serving University facilities.

LRDP Mitigation TRA-4C: Based on the results of LRDP Mitigation TRA-4A, the Campus shall implement measures that reduce transit delay associated with pedestrian crosswalks on campus roadways.

LRDP Mitigation TRA-4D: The Campus shall coordinate implementation of needed campus roadway and circulation improvements identified in the 2005 LRDP with the pace of campus development, to the extent feasible.

LRDP Mitigation TRA-4E: Based on the results of LRDP Mitigation TRA-4A, the Campus shall implement the bicycle circulation elements of the 2005 LRDP as needed to maintain and enhance the effectiveness of bicycles as a transportation mode.

LRDP Mitigation TRA-4F: The Campus shall implement integrated transit, bicycle and pedestrian way-finding systems on the main campus.

Residual Significance: Less than significant

Since its inception, UC Santa Cruz has focused on a vision of development on a human, walkable scale. An important goal, under the proposed 2005 LRDP, is to ensure that the campus remains user friendly and walkable and all areas are well connected throughout the campus and the community of Santa Cruz, by effective transit, pedestrian and bicycle networks. An important element of the proposed 2005 LRDP is maintenance and improvement of TDM programs that have been highly successful in reducing the number of single-occupant vehicles used to access the campus, and encouraging and facilitating the use of transit and pedestrian and bicycle travel. The University of California recently adopted guidelines to advance sustainable transportation initiatives across the UC system (The Regents 2005). The transportation program described in the proposed 2005 LRDP supports those initiatives.

Campus growth under the 2005 LRDP would result in increased numbers of motor vehicles, bicycles and pedestrians on campus. Increased circulation volumes could exceed the capacity of existing circulation networks on campus, reduce the efficiency of these circulation networks, diminish the efficiency of transit services, and exacerbate incompatibilities between the various travel modes, which could reduce the effectiveness of programs supporting alternative modes of transportation, including transit, bicycle and pedestrian travel.

The Urbitran transit study recently completed for UC Santa Cruz (Urbitran 2004b) projects a potential to increase on-campus transit ridership 43 percent to 73 percent by 2020. This increase is anticipated to result in transit demands on campus that would exceed the capacity of the existing campus transit system. In addition, the proposed 2005 LRDP is expected to result in an increase in roadway and intersection congestion. The increase in delays at individual intersections and along roadways could aggregate to cause an increase in transit travel times, which could also diminish the competitiveness of transit travel in comparison to automobile travel. Diminished transit efficiency could undermine the effectiveness of and result in conflicts with campus and regional alternative transportation programs. Further, congestion and safety issues, and difficulty in reaching destinations on foot or by bicycle due to inconvenient routing or lack of designated routes, may discourage pedestrian and bicycle travel modes, which would undermine TDM programs.

In addition to issues related to transit delays, the growth in campus population and construction of new facilities and roads would increase the number of pedestrians and bicycles on campus and increase the potential for pedestrian, bicycle and vehicle conflicts. Currently, 3 percent of the population travels to the main campus travels by bicycle; additionally, an undetermined number of campus residents make intra-campus trips by bicycle. Even if this mode share remains constant, the increase in campus population would result in an increase in bicycles accessing the main campus and 2300 Delaware Avenue and using the internal main campus roadways. Because of the absence of designated bicycle and pedestrian facilities on many of the main campus roads, increases in bicycle, pedestrian, and vehicular travel under the proposed 2005 LRDP would result in an increase in potential conflicts among these modes, particularly along Hagar and Heller Drives and on internal streets within the campus core, including McLaughlin

Drive and Steinhart Way. Campus development that is not well served with pedestrian and bicycle improvements would be inconsistent with campus, City and regional programs supporting alternative transportation. The Campus would implement a range of mitigation measures to address these issues.

Under LRDP Mitigation TRA-4A, the Campus would monitor transit travel times, which are a key measure of TDM effectiveness. In addition to travel times, the Campus would monitor and collect data on cycle times, overall ridership trends, pass-by statistics, on-time performance and other factors that affect transit efficiency. There are numerous contributors to transit delay, including traffic control devices, vehicular traffic volumes, pedestrian crossings, and bus traffic. The highest contributors to transit travel time delay include traffic control devices and pedestrian crossings at intersections (75 percent), followed by traffic volumes (19 percent), and other bus traffic (6 percent) (Urbitran 2004a). The greatest delay on campus is experienced during class change times, when large numbers of pedestrians circulate between classes. During class change times, a transit trip around the campus takes about 3.5 minutes longer than a trip made during non-class change times. It is anticipated that as the campus population increases under the 2005 LRDP, transit travel time delay would increase.

If monitoring conducted under LRDP Mitigation TRA-4A indicates that transit delays are increasing, under LRDP Mitigation TRA-4B, the Campus would institute measures to improve the character and operations of the Campus transit system as needed to improve capacity and efficiency. These may include measures recommended in the Urbitran report with respect to transit vehicle size and frequency (Urbitran 2004b). In addition, the Campus would continue to coordinate and collaborate with transit agencies whose routes serve the campus, in order to maintain and improve efficiency and capacity of the transit systems serving the campus, in support of TDM programs both on- and off-campus. The feasibility of on- and off-campus roadway modifications that would allow transit vehicles to bypass other traffic at intersections and on congested roadways is presently being analyzed by Urbitran Associates on behalf of SCMTD, the City of Santa Cruz and UC Santa Cruz as part of a Bus Rapid Transit (BRT) feasibility study. If such improvements are determined to be feasible, they would be incorporated in future improvement projects. For example, the LRDP-proposed Glenn Coolidge Drive/Hagar Drive connector could be designed to accommodate dedicated bus lanes, transit queue-jump lanes, and/or use of transit-priority signals at intersections as traffic signals become warranted.

LRDP Mitigation TRA-4C provides for the implementation of improvements to separate pedestrians from transit crossing points, which would diminish transit congestion and facilitate maintenance or reduction of travel times. This would improve transit capacity, which is in part a function of the length of time a given bus requires to circulate through the campus. Some pedestrian separation measures that could be implemented concurrently with development to improve campus circulation include:

- Grade-separated pedestrian crossings could be developed in conjunction with construction of new facilities adjoining roadways in the central campus, such as new academic buildings along McLaughlin Drive, new Student Life facilities along Hagar Drive, and new parking facilities and other buildings near the Performing Arts area.
- A major pedestrian corridor could be extended through a large existing culvert beneath McLaughlin Drive immediately west of Chinquapin Drive, in conjunction with new development in the vicinity of Quarry Plaza, Colleges Nine and Ten, and the north campus lands.

- Where grade-separated pedestrian crossings are impractical, installation of channelized, signal-controlled pedestrian crossings could be considered in conjunction with development in the vicinity of transit stops at Porter/College Eight, Science Hill, Colleges Nine/Ten and the Health Center, and Cowell College/Quarry Plaza.

Additional or other pedestrian measures could be identified and implemented over the course of time to meet changing conditions on campus and to incorporate new technologies as they are developed.

Under the proposed 2005 LRDP, pedestrian/bicycle/motor vehicle conflicts are expected to increase at locations on campus where there are already high levels of pedestrian and bicycle movements. These locations include, but are not limited to, Hagar Drive/McLaughlin Drive; McLaughlin Drive/Chinquapin Drive; McLaughlin Drive/College Ten; the bus stops at Science Hill; McLaughlin Drive/Steinhart Way; Heller Drive/McLaughlin Drive; Heller Drive/Kresge and Kerr Hall pedestrian bridges; and the College 8/Porter College bus stops. New on-campus roadways proposed in the 2005 LRDP would include sidewalks and/or parallel pedestrian pathways and Class II bike lanes to separate pedestrians and bicycles from motor vehicle traffic, and to provide convenient and direct pedestrian and bicycle routes. The proposed LRDP also includes the construction of Class II bike lanes along existing campus roadways. These elements of the 2005 LRDP will help to diminish the potential for increased conflicts between pedestrians, bicycles and motor vehicles on campus.

The proposed 2005 LRDP includes elements, policies and design features to improve vehicular circulation and transit efficiency on campus. BRT improvements that could substantially improve transit efficiency also have been identified, and the feasibility of these improvements is under study, as noted above. Depending on the timing of implementation of vehicular and transit route design improvements relative to the rate of population and related traffic increases, development could result in interim traffic congestion and transit efficiency impacts that would result in diminished transit capacity and increased delays. Under LRDP Mitigation TRA-4D, the Campus would coordinate the timing of circulation improvements identified in the 2005 LRDP with other development on campus, to support the maintenance of effective TDM programs by improving transit efficiency and overall circulation on campus. Circulation improvements identified in the proposed 2005 LRDP are:

- Construction of the envisioned Glenn Coolidge Drive/Hagar Drive Connector road and a new Transit Hub (to include large sheltered transit loading and passenger queuing areas) at the East Collector Parking Facility
- Construction of the eastern bridge of the Meyer Drive Extension between Hagar Drive and the Hahn parking lot
- Construction of the western bridge of the Meyer Drive Extension between the Hahn parking lot and the Library Access Road

Under LRDP Mitigation TRA-4E, the Campus would implement the bicycle circulation elements of the proposed 2005 LRDP as needed to maintain and enhance the effectiveness of bicycles as a transportation mode as development under the LRDP proceeds. This measure would assist in the extension of TDM programs to the areas proposed for new development under the 2005 LRDP.

Under LRDP Mitigation TRA-4F, the Campus would improve and coordinate pedestrian, bicycle and motor vehicle way-finding on campus, to identify the most direct routes and encourage use of separated pedestrian and bicycle routes. This would reduce the potential for conflicts between bicyclists, pedestrians and motor vehicles and further support alternative modes.

LRDP Mitigations TRA-4A through TRA-4F would reduce conflicts and improve transit, pedestrian and bicycle circulation through the campus in coordination with the campus development proposed under the 2005 LRDP, and would provide for collaboration with off-campus transit providers. The implementation of these measures would support Campus, City and regional TDM programs and would reduce potential conflicts of development under the proposed 2005 LRDP with these TDM programs. With the implementation of these mitigation measures, the impact of the proposed 2005 LRDP with respect to conflicts with alternative transportation programs would be less than significant.

LRDP Impact TRA-5:	Traffic generated by simultaneous full-capacity special events on campus would cause the off-campus intersections listed in Table 4.14-22 to operate at LOS E or F during event-related peak hours. On-campus, the special event traffic could cause congestion related to visitors searching for parking.
Significance:	Less than significant
LRDP Mitigation TRA-5A:	The Campus shall implement LRDP Mitigations TRA-2A, TRA-2B, TRA-3B, TRA-3C, and TRA-4A through -4E.
LRDP Mitigation TRA-5B:	The Campus shall improve parking management for special events, through appropriate expansion of on-campus parking enforcement at nights and on weekends in order to better manage parking resources to accommodate campus needs.
LRDP Mitigation TRA-5C:	The Campus shall provide on-line parking permit sales and way-finding information for visitors in order to reduce back-ups of vehicles at the main entrance kiosk.
LRDP Mitigation TRA-5D:	The Campus shall continue to promote use of the on-line Campus Events Calendar system to improve coordination between campus units, and to coordinate traffic and parking management for traffic-producing events.
Residual Significance:	Not applicable

The following special events analysis evaluates traffic and parking conditions under a "reasonable worst-case" scenario, consisting of simultaneous full capacity on-campus events at existing campus venues, and at the Performing Arts Auditorium and the Event Center, two new venues that are proposed under the 2005 LRDP. Table 4.14-21 presents the assumptions used to derive the estimated trips associated with the events. Existing venues on campus have a capacity of about 1,500 persons. The Event Center would have a capacity of 5,000 persons, and the Performing Arts Auditorium would have a capacity of 1,500 persons. Full capacity reasonable worst-case events are assumed to occur on weekday evenings between 8:00 PM

and 10:30 PM. Arrival times for simultaneous events are assumed to be spread over a two-hour period. Attendees of events at existing venues and the Performing Arts Auditorium with general seating would typically start arriving earlier than Event Center attendees with ticketed seating. Departure time would occur immediately after the events at 10:30 PM. Therefore, the inbound peak hour would generate fewer trips than the outbound peak hour at 2,160 automobile trips. The outbound peak hour would generate 3,150 trips.

Table 4.14-21
Estimated Special Events Trip Generation

	Existing Events Facilities	**Event Center**	**Arts Auditorium**
Primary Parking Location	New Performing Arts Lot	East Collector	New Performing Arts Structure
	West Collector		West Collector
	Core West Structure		Core West Structure
Facility Occupancy (persons)	1,500	5,000	1,500
Event Start/End	8:00 PM - 10:30 PM	8:00 PM - 10:30 PM	8:00 PM - 10:30 PM
Arrival Times			
6:00 - 6:30 PM	30%	10%	30%
6:30 - 7:00 PM	25%	40%	25%
7:00 - 7:30 PM	35%	35%	35%
7:30 - 8:00 PM	10%	15%	10%
Departure Time			
10:30 - 11:00 PM	100%	100%	100%
Auto Mode Share	90%	90%	90%
Average Auto Occupancy	2.0	2.5	2.0
Total Event Trip Generation (two-way)	1,350	3,600	1,350
Inbound Trip Generation			
6:00 - 7:00 PM	371	900	371
6:30 - 7:30 PM	405	1,350	405
7:00 - 8:00 PM	304	900	304
Peak Inbound Hour (6:30 - 7:30 PM)	405	1,350	405
Outbound Trip Generation			
10:30 - 11:30 PM	675	1,800	675
Total Peak Inbound			**2,160**
Total Peak Outbound			**3,150**

The special events traffic analysis evaluates the impact during the special event inbound and outbound peak hours. The inbound peak hour occurs between 6:30 PM and 7:30 PM, and the outbound peak hour occurs between 10:30 PM and 11:30 PM. Using 24-hour traffic counts on roadways near the campus, it was determined that off-campus traffic volumes in the inbound peak hour are about 71 percent of the weekday PM peak hour traffic volumes, and about 27 percent of the weekday PM peak hour volumes during the outbound peak hour. These factors were applied to the 2020 PM peak hour traffic projections (with project) to establish baseline conditions for the special events analysis. The resulting intersection levels of service are shown in Table 4.14-22.

Table 4.14-22
2020 PM Special Event Levels of Service – Off-Campus Intersections

#	Intersection	Type of Control	Peak Hour	LOS Standard	2020 (Special Events – Inbound)		2020 (Special Events – Outbound)	
					Delay (sec)[a]	LOS	Delay (sec)[a]	LOS
7	Highway 1 / Western Drive	Signal	PM	D	24.4	C	19.8	B
8	Empire Grade Road / Western Drive	TWSC	PM	--	**875.0**	**F**	**204.9**	**F**
9	Empire Grade Road / Heller Drive [a]	TWSC	PM	--	18.5	C	**335.8**	**F**
10	Bay Street-Glenn Glenn Glenn Coolidge Drive / High Street	Signal	PM	D	**83.2**	**F**	**162.6**	**F**
11	Bay Street / Nobel-Iowa Drive	Signal	PM	D	12.5	B	9.1	A
12	Bay Street / Escalona Drive [a]	TWSC	PM	--	**109.5**	**F**	**164.9**	**F**
13	Bay Street / King Street	Signal	PM	D	**100.5**	**F**	**65.4**	**E**
14	Mission Street / Bay Street	Signal	PM	D	**148.2**	**F**	32.3	C
17	Mission Street / Laurel Street	Signal	PM	D	**82.3**	**F**	17.1	B
18	Mission Street / Walnut Avenue	Signal	PM	D	14.1	B	8.4	A
19	Mission Street / King Street-Union Street	Signal	PM	D	**144.6**	**F**	33.5	C
20	Mission Street / Chestnut Street	Signal	PM	E	**113.0**	**F**	21.1	C
22	High Street / Storey Street	AWSC	PM	--	24.6	C	10.3	B
23	King Street / Storey Street	AWSC	PM	--	**43.3**	**E**	**281.3**	**F**
24	Mission Street / King Street (West)	TWSC	PM	--	18.4	C	10.3	B
30	High Street / Highland Avenue	AWSC	PM	--	**203.4**	**F**	8.6	A

Note:
TWSC – Two-Way Stop-Controlled
AWSC – All-Way Stop-Controlled
(a) These intersections have been found to meet warrants for the installation of traffic signals for existing conditions.

In the inbound peak hour, during special events, 10 intersections would operate at level of service (LOS) E or F. Seven of these intersections would operate at LOS E or F in the PM peak hour under 2020 With LRDP Project conditions without special events. In the outbound peak hour, six intersections would operate at LOS E or F, three of which would operate at LOS E or F during the PM peak hour under 2020 With LRDP Project conditions without special events.

Special events on campus would create highly peaked traffic impacts, lasting between 15 and 30 minutes, particularly in the outbound direction after the event. Most of the impacts would occur at intersections impacted by typical traffic conditions and, therefore, would be mitigated with the intersection improvements specified in LRDP Mitigation TRA-2A. However, because of the relative infrequency of multiple simultaneous special events, the implementation of LRDP Mitigation TRA-2A intersection and roadway capacity improvement measures to mitigate special events impacts may not be realistic or desirable because of potential secondary impacts to pedestrians and bicyclists. Because the impact of

special event traffic with respect to intersection LOS would be relatively infrequent and of short duration, the impact would be less than significant. It would be further reduced by the mitigations cited.

Simultaneous full-capacity special events on campus would create a demand for on-campus parking. This demand would equal the number of vehicles estimated to arrive and depart before and after the events, or about 3,150 vehicles. During the evening there would be sufficient parking to accommodate this number of campus visitors, but the location and availability of parking facilities may be unknown to visitors, and available parking may be inconvenient to the events. This could result in circulating vehicles searching for parking, leading to excess traffic and potential pedestrian/vehicle conflicts. There also could be a perceived shortage of parking if persons unfamiliar with the campus have difficulty finding parking.

Additional mitigation measures proposed under other impacts, above, would also reduce special event traffic impacts. For example, LRDP Mitigations TRA-3B through TRA-3C would ensure that the campus has adequate parking capacity and provides parking management strategies that would reduce congestion related to a search for parking. The circulation improvements identified in LRDP Mitigations TRA-4A through TRA-4E would improve motor vehicle, bicycle and pedestrian circulation and way-finding through the campus, would make public transit more convenient and efficient, which may encourage use of travel alternatives for event attendees, and would reduce potential conflicts between motor vehicles and users of other transportation modes. All these measures will contribute to the reduction of traffic congestion related to the search for parking and event venues.

The Campus would continue existing practices for the management of special event traffic, including the development of special event traffic management plans. In addition, the Campus would implement LRDP Mitigation TRA-5B, under which the hours of parking enforcement may be expanded in an effort to discourage night storage on campus of vehicles that consumes campus parking capacity; LRDP Mitigation TRA-5C, which provides for on-line sales of advance parking tickets to diminish parking kiosk waiting and on-line way-finding for visitors to diminish campus circulation during event parking; and TRA-5D, which encourages the use of the Campus on-line calendar for special event scheduling to coordinate management of simultaneous special events on campus. Implementation of these measures would further reduce the less-than-significant impact related to special event parking.

4.14.3 References

AMBAG (Association of Monterey Bay Area Governments). 2005. Regional Travel Demand Forecasting Model. 2005 version.

Caltrans (California Department of Transportation). 1996. Manual of Traffic Controls.

Caltrans (California Department of Transportation). 2002. *Guide for the Preparation of Traffic Impact Studies*. December.

Caltrans (California Department of Transportation). 2003 and 2004. *Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways*, 2003 Edition and the MUTCD 2003 California Supplement, May 20, 2004.

City of Santa Cruz. *General Plan 1990-2005, Circulation Element.*

City of Santa Cruz. 2003. *Bicycle Transportation Plan 2004*. Adopted October 17, 2003.

City of Santa Cruz. 2003. *Master Transportation Study* (MTS). July 23.

City of Santa Cruz. 2003. *Pedestrian Master Plan*. Adopted: October 17.

Daisa, J. 2005. Kimley-Horn and Associates, Inc. Personal communication with S. Morgan, UC Santa Cruz. October 10.

Higgins Associates. 1999. *University of California Santa Cruz, Core West Parking Structure Traffic Study*. February.

Higgins Associates. 2005. Letter to Strelow Consulting regarding UCSC Digital Arts Facility: Laurent Street/High Street Traffic Analysis. August 16.

The Regents (The Regents of the University of California). 2005. Sustainable Transportation Initiatives Guidelines. Adopted September 22.

Transportation Research Board. 2000. *Highway Capacity Manual* (HCM).

UCSC (University of California, Santa Cruz). 1988. *1988 Long Range Development Plan* (LRDP). http://ppc.ucsc.edu/cp/planning/lrdp/

UCSC (University of California, Santa Cruz). Transportation and Parking Services (TAPS). http://www2.ucsc.edu/taps/

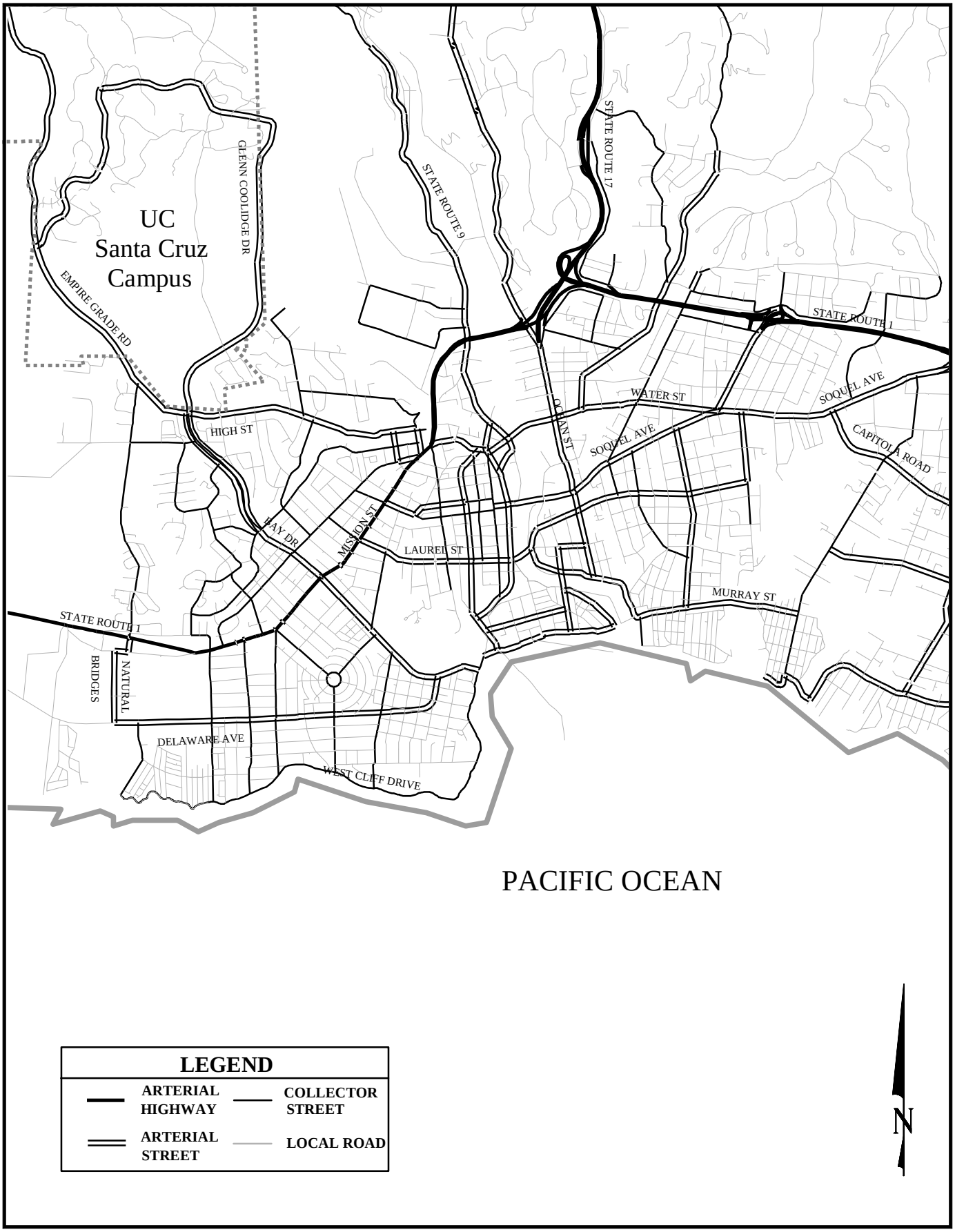
UC Santa Cruz TAPS (Transportation and Parking Services). 2003. Weekly traffic counts conducted at campus main entrances in 2003. Data provided by Larry Pageler in November 2004.

UC Santa Cruz TAPS (Transportation and Parking Services). 2004. *Parking Utilization Survey*, Spring 2004. Data provided by Larry Pageler.

UCSC (University of California, Santa Cruz). 2004. Spring 2004 Modal Mix Survey conducted by UC Santa Cruz Transportation and Parking Services (TAPS). On file, UC Santa Cruz TAPS office.

Urbitran Associates (Urbitran). 2004a. UCSC Pedestrian Data Collection and Analysis. Prepared for UCSC TAPS. June.

Urbitran (Urbitran Associates). 2004b. UCSC Comprehensive Transit Study. Prepared for UCSC TAPS. March.



Source: Kimley-Horn & Associates

CIRCULATION NETWORK AND ROADWAY CLASSIFICATIONS

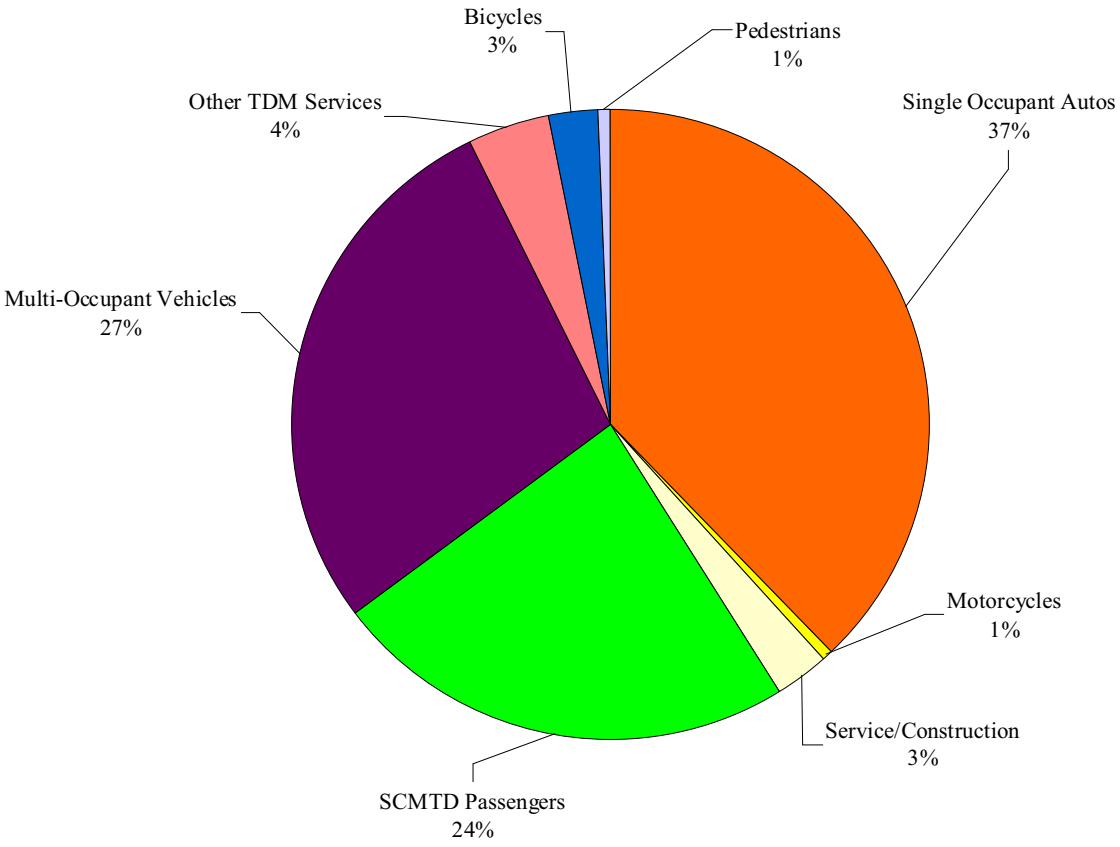
October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-1

UC Santa Cruz Modal Mix
Spring 2004 Passenger-Trips



Source: Fehr and Peers

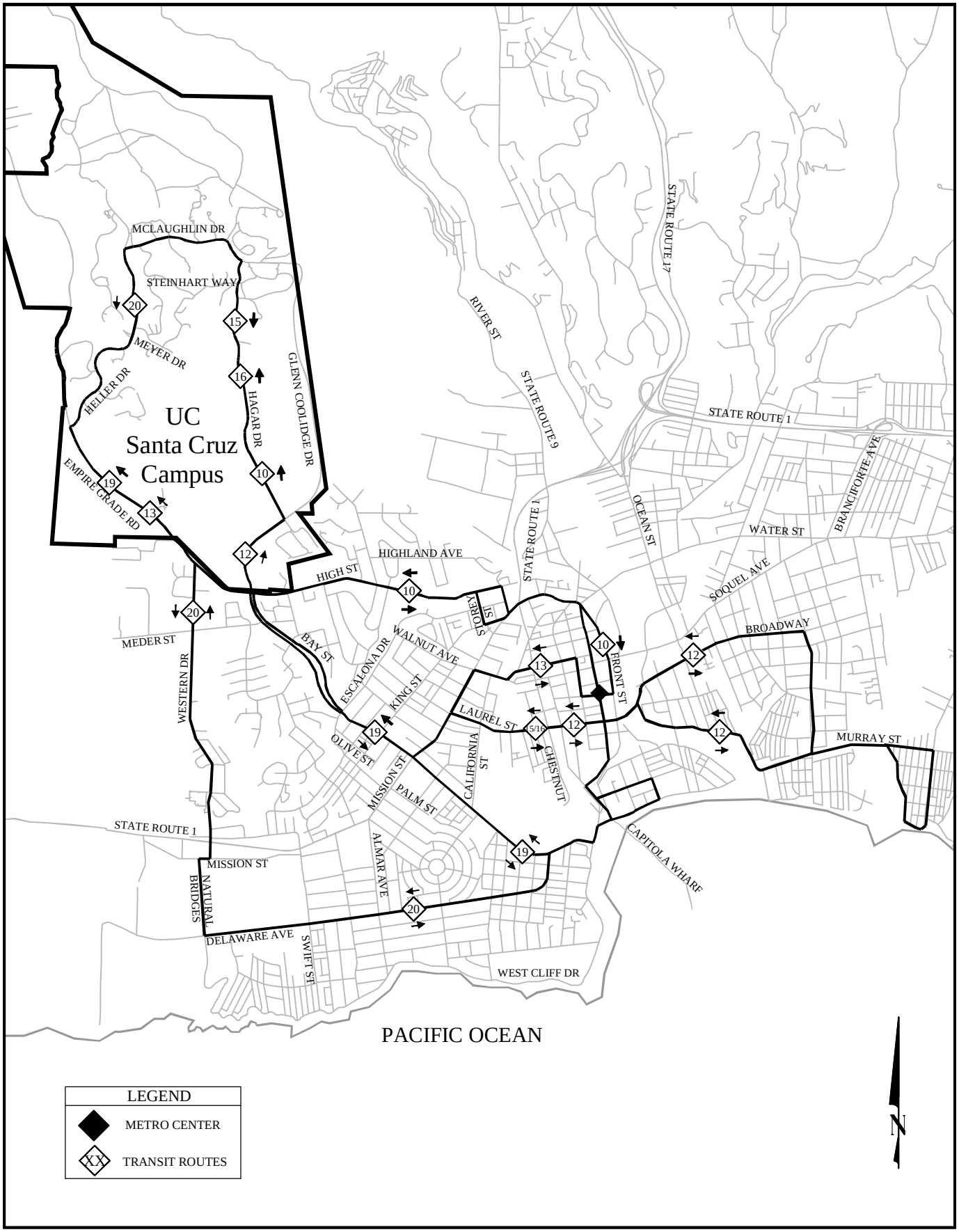
UC SANTA CRUZ MODAL MIX

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-2



Source: Kimley-Horn & Associates

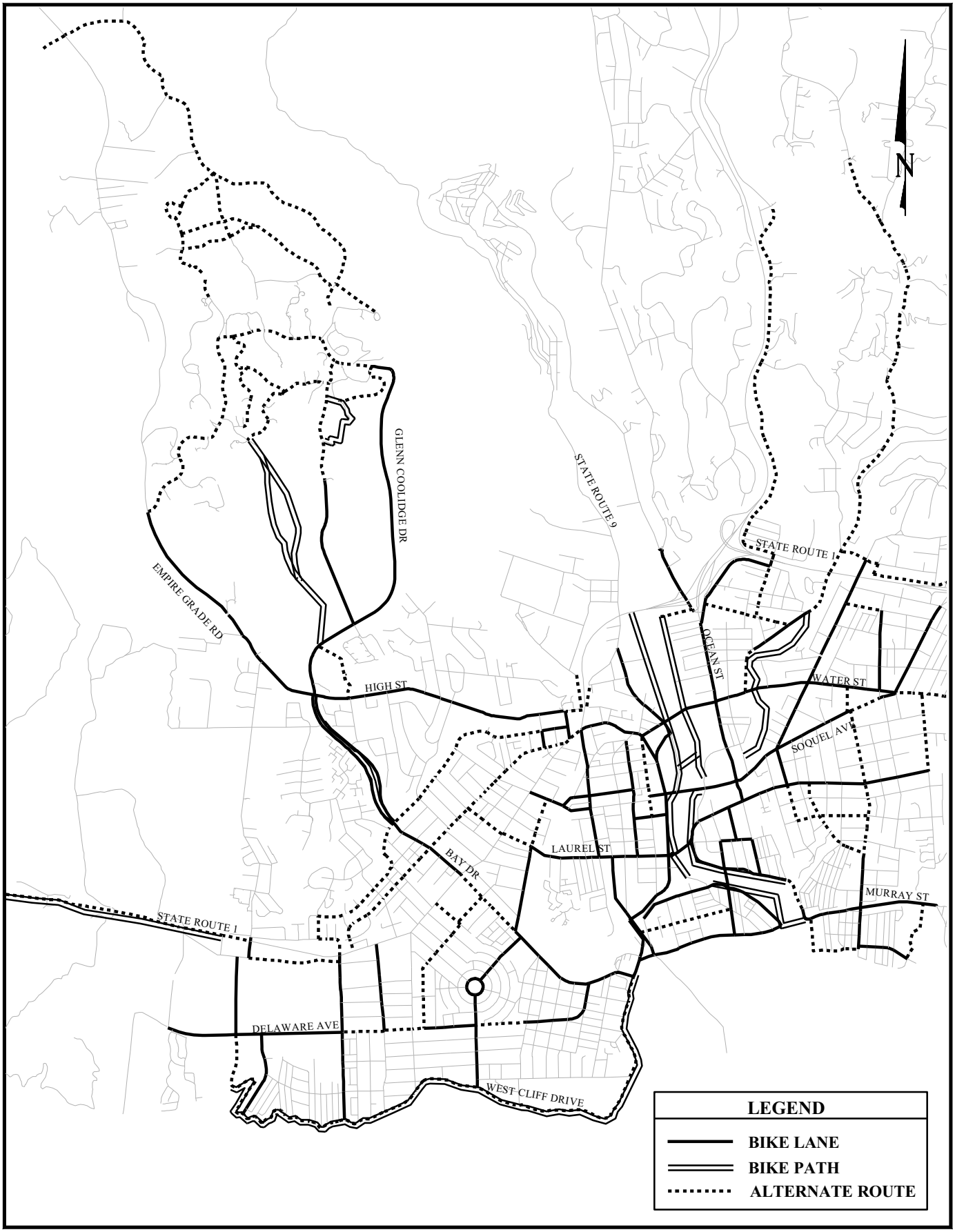
EXISTING TRANSIT ROUTES TO UC SANTA CRUZ CAMPUS

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-3



Source: Kimley-Horn & Associates

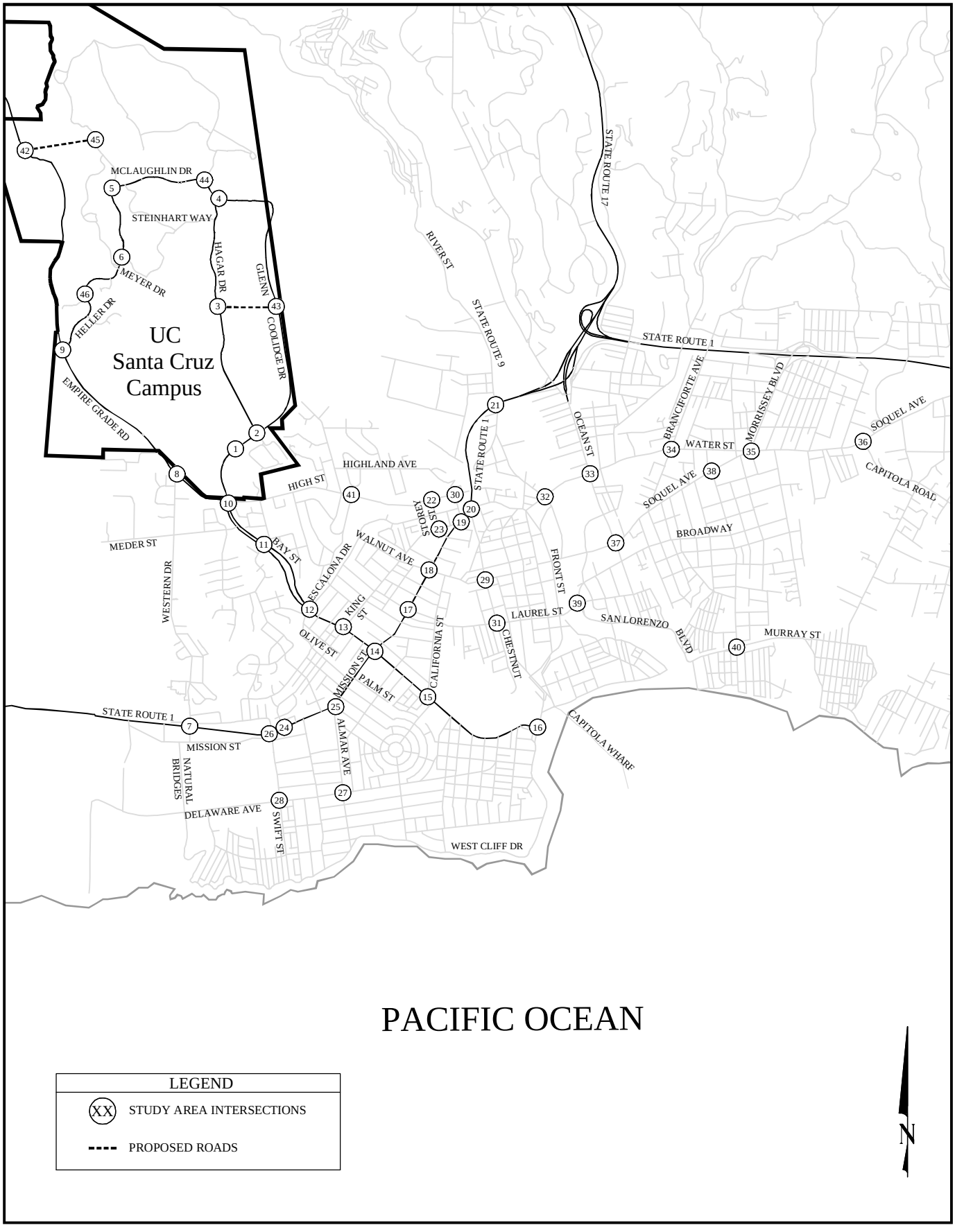
EXISTING BICYCLE CIRCULATION NETWORK

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-4



Source: Kimley-Horn & Associates

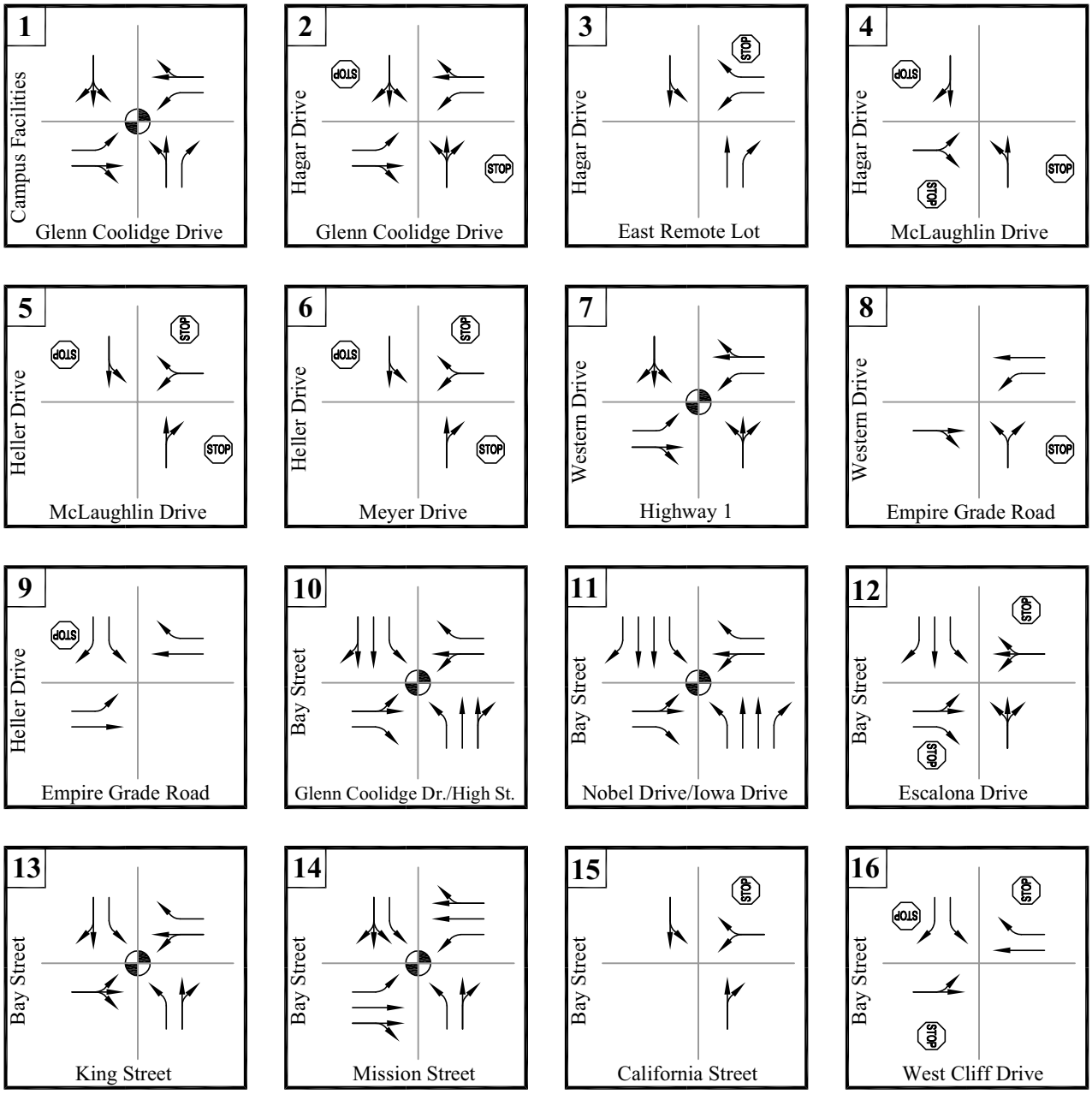
STUDY INTERSECTION LOCATIONS

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-5



Source: Fehr and Peers

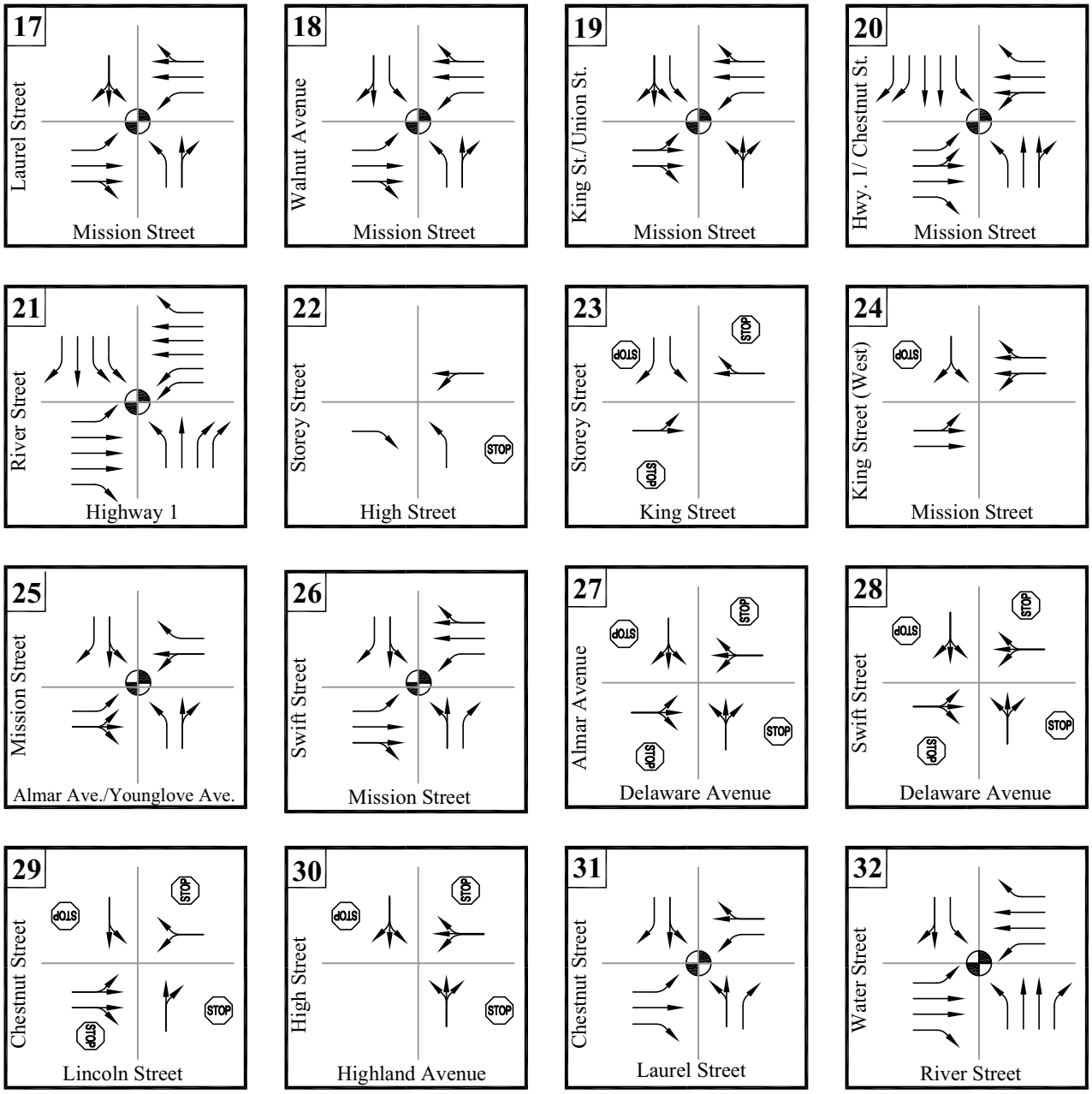
EXISTING CONDITIONS INTERSECTION GEOMETRY

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-6a



Source: Fehr and Peers

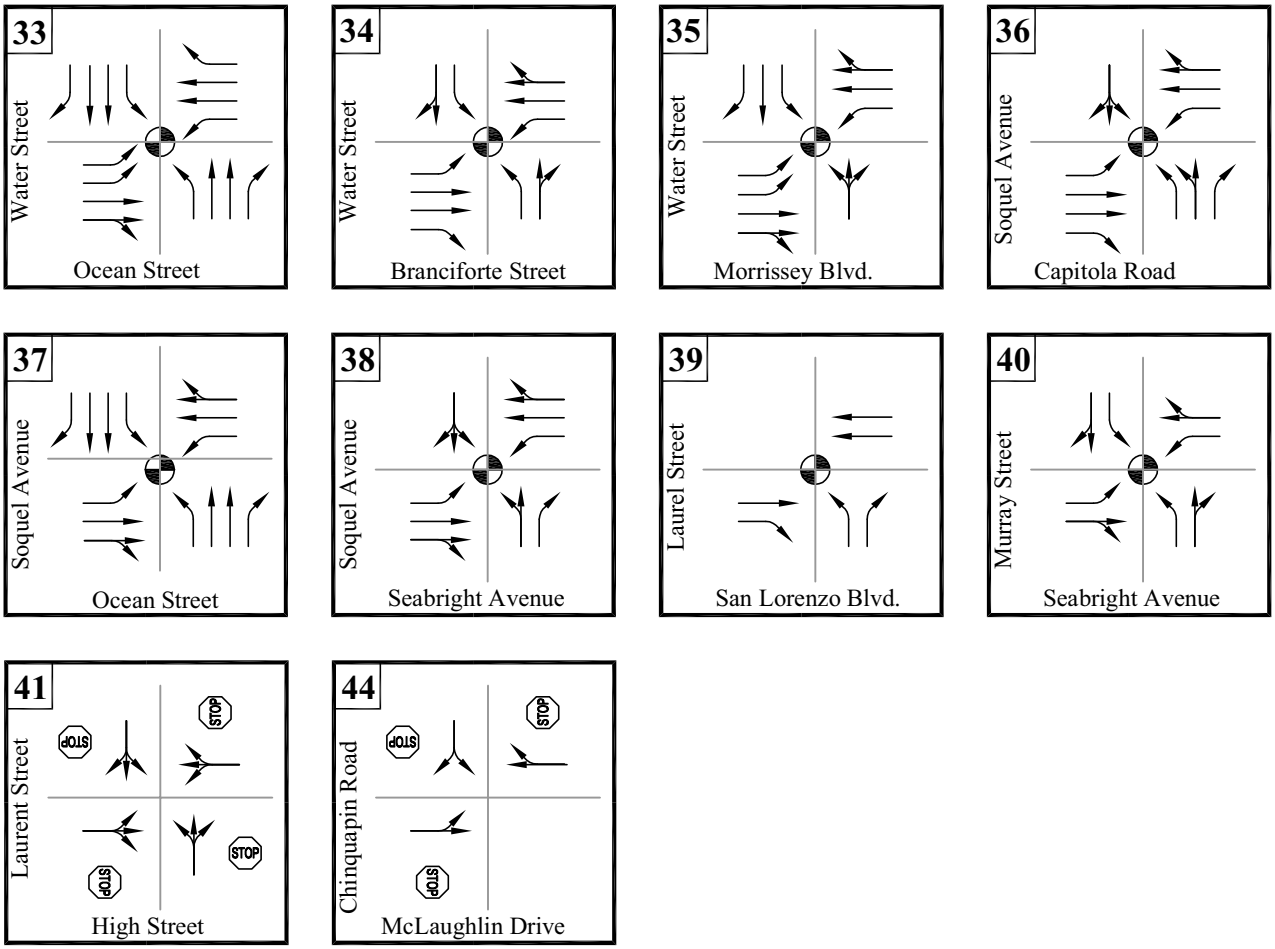
EXISTING CONDITIONS INTERSECTION GEOMETRY

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-6b



LEGEND

- X — STUDY AREA INTERSECTIONS
- TRAFFIC SIGNAL
- STOP — STOP SIGN

Source: Fehr and Peers

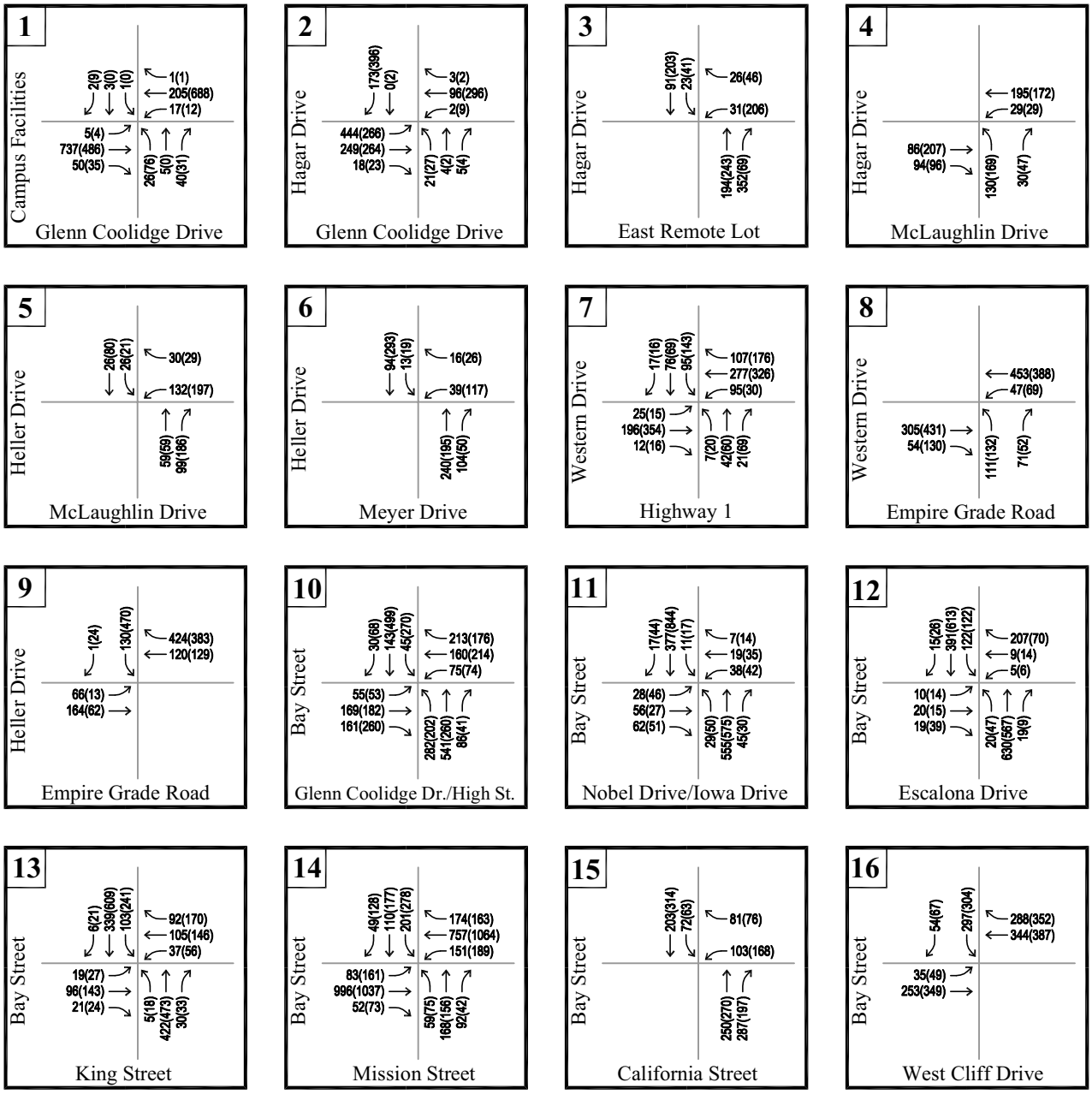
EXISTING CONDITIONS INTERSECTION GEOMETRY

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-6c



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Fehr and Peers

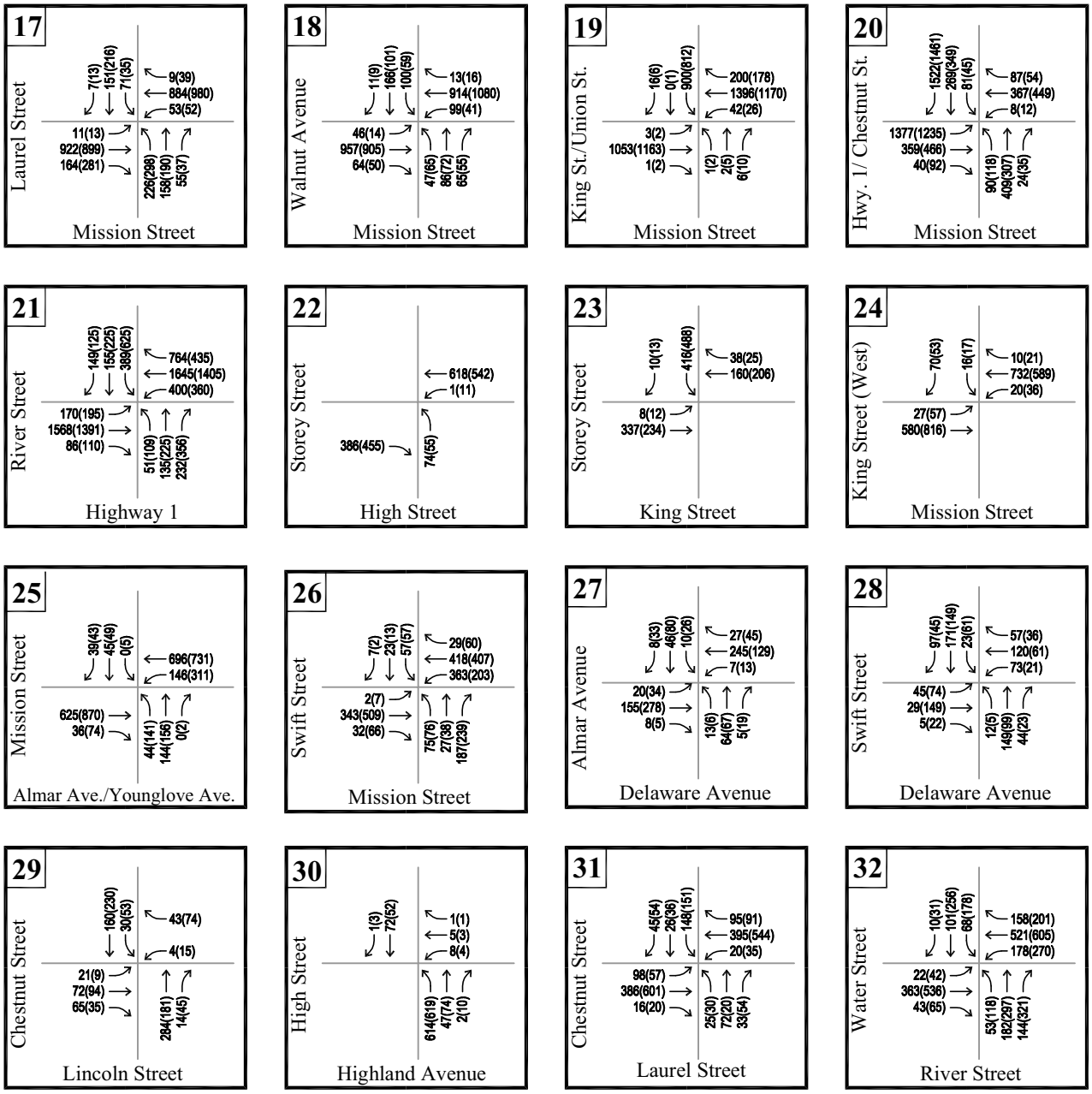
EXISTING CONDITIONS INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-7a



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Fehr and Peers

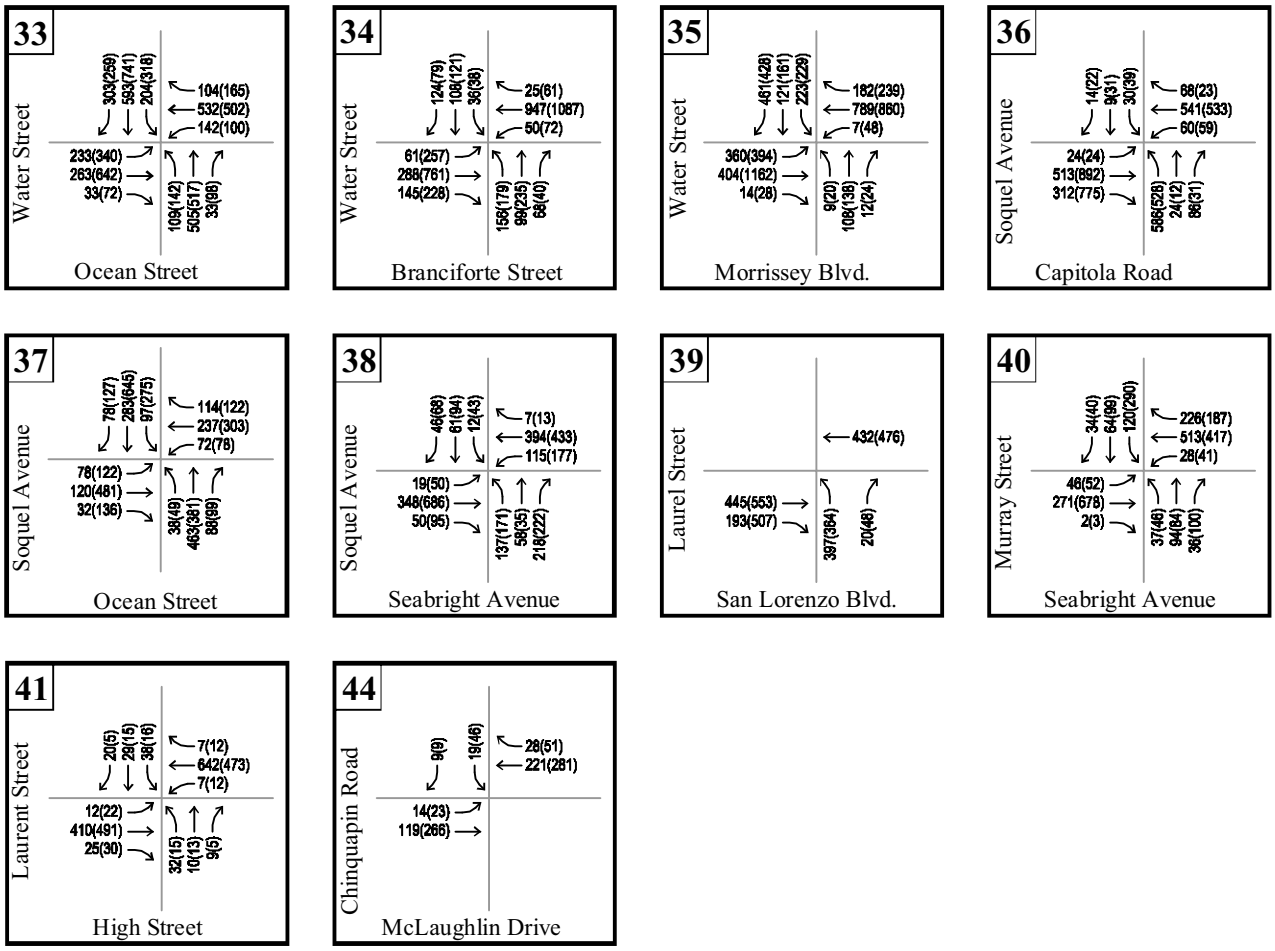
EXISTING CONDITIONS INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-7b



Source: Fehr and Peers

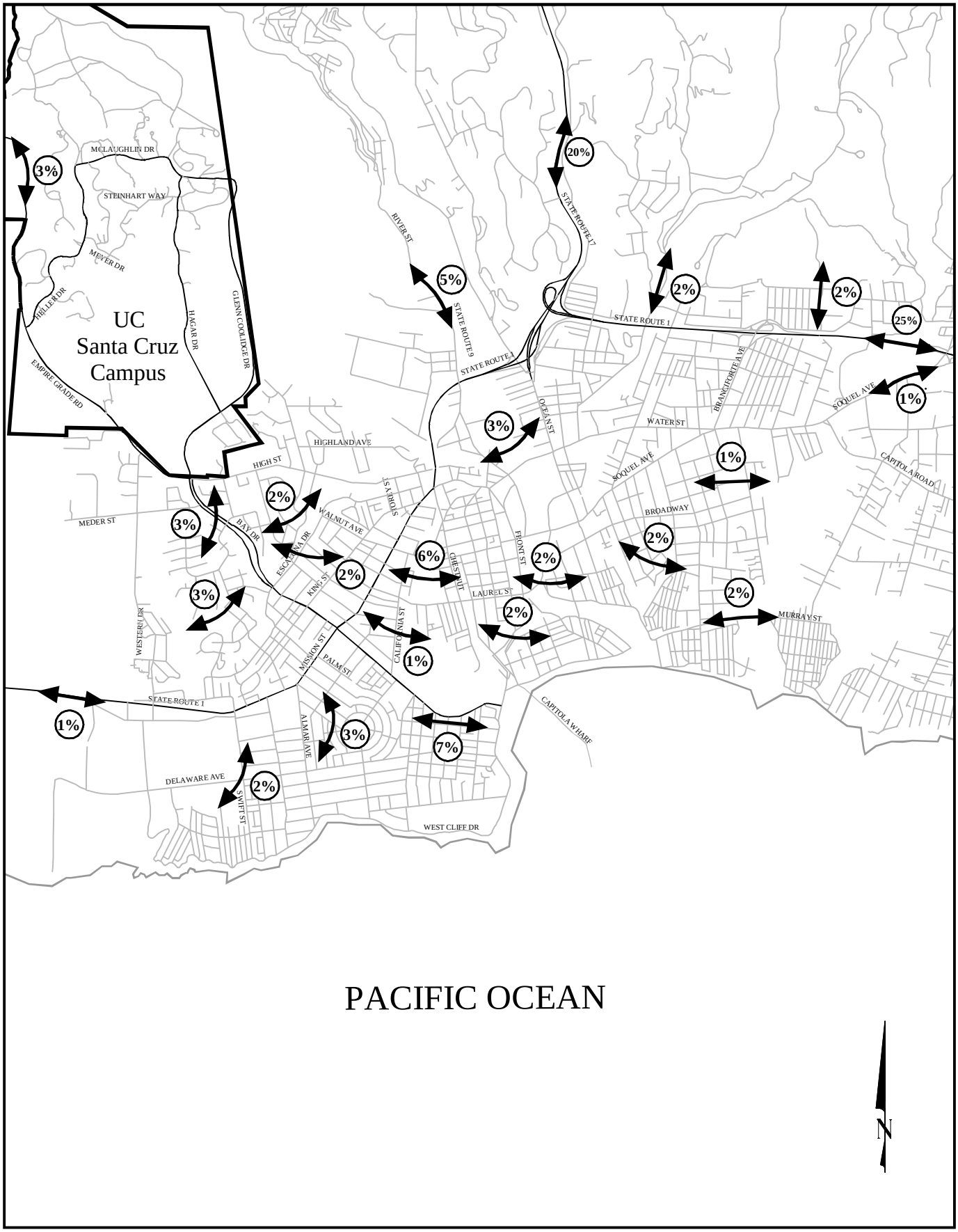
EXISTING CONDITIONS INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-7c



Source: Kimley-Horn & Associates

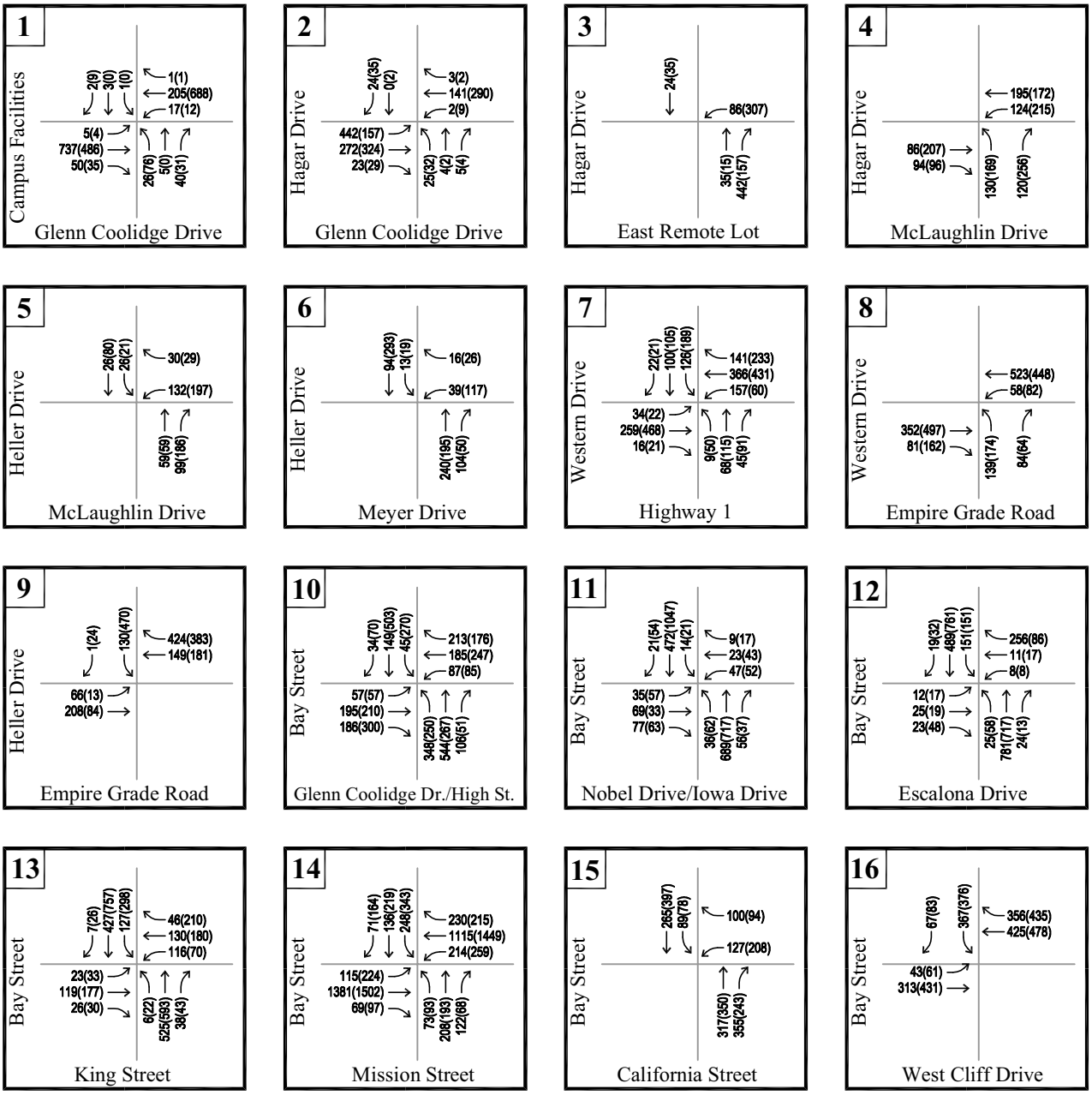
PROJECT TRIP DISTRIBUTION

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-8



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

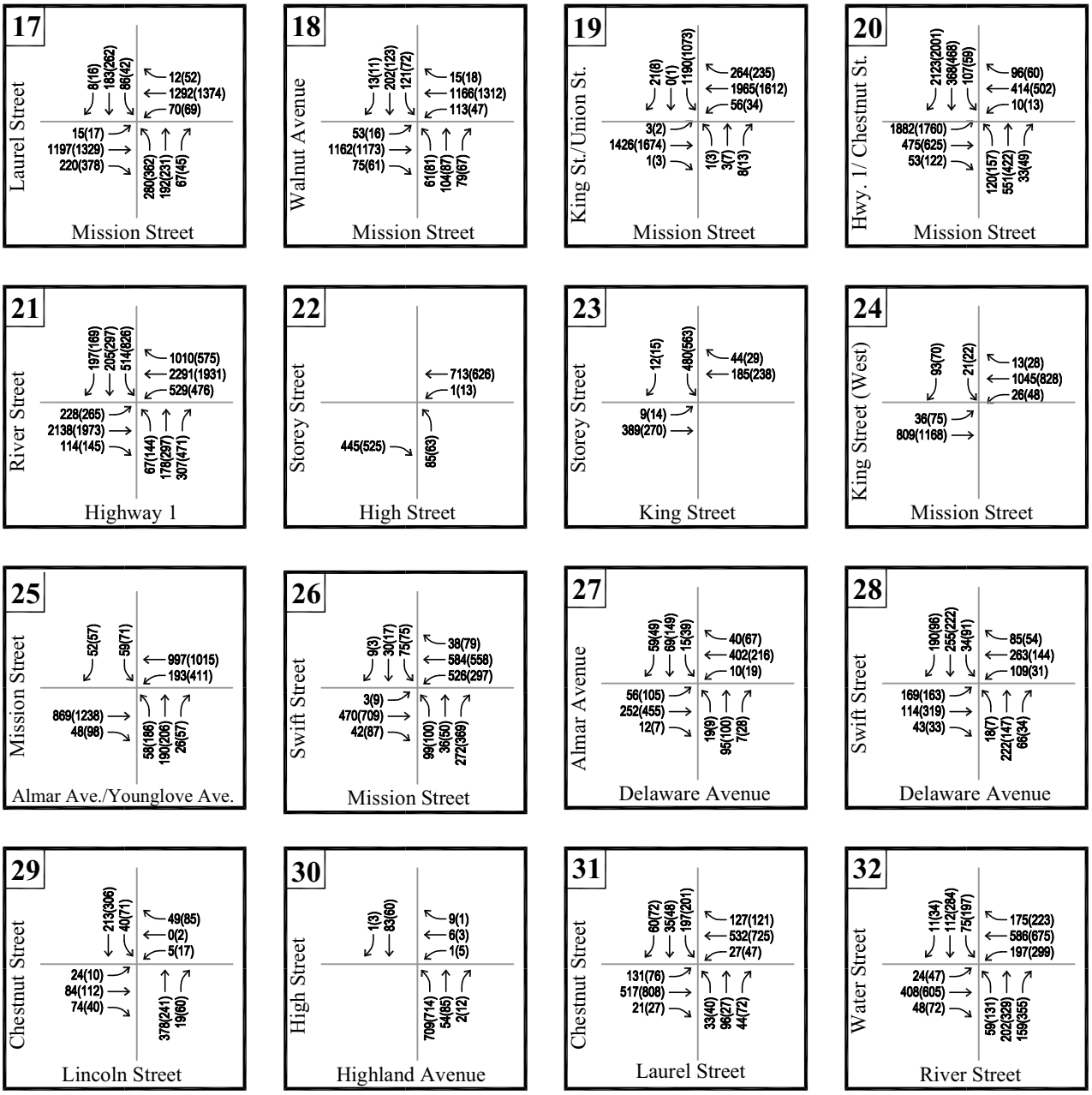
2020 WITHOUT PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-9a



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

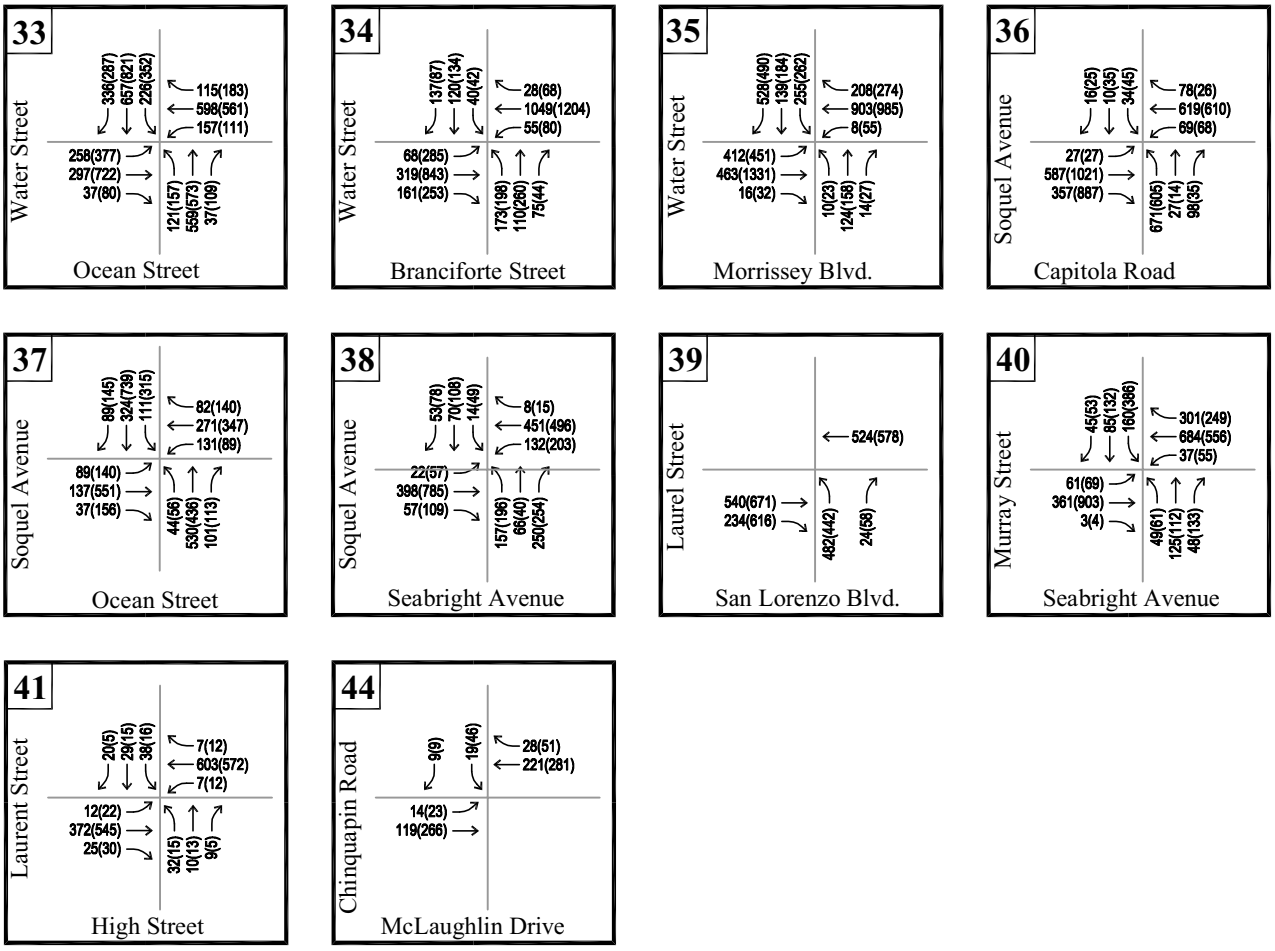
2020 WITHOUT PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-9b



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

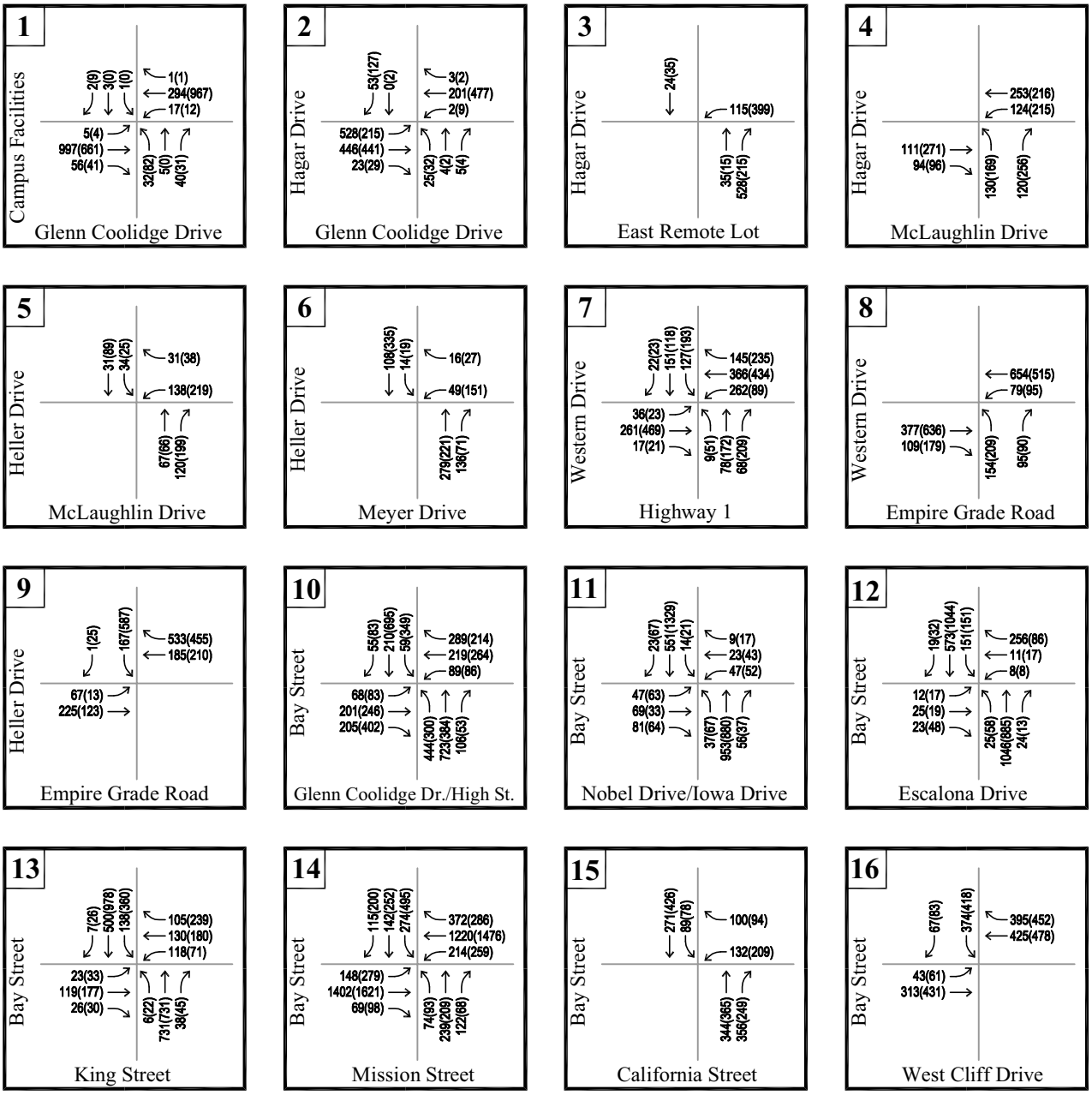
2020 WITHOUT PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-9c



Source: Kimley-Horn & Associates

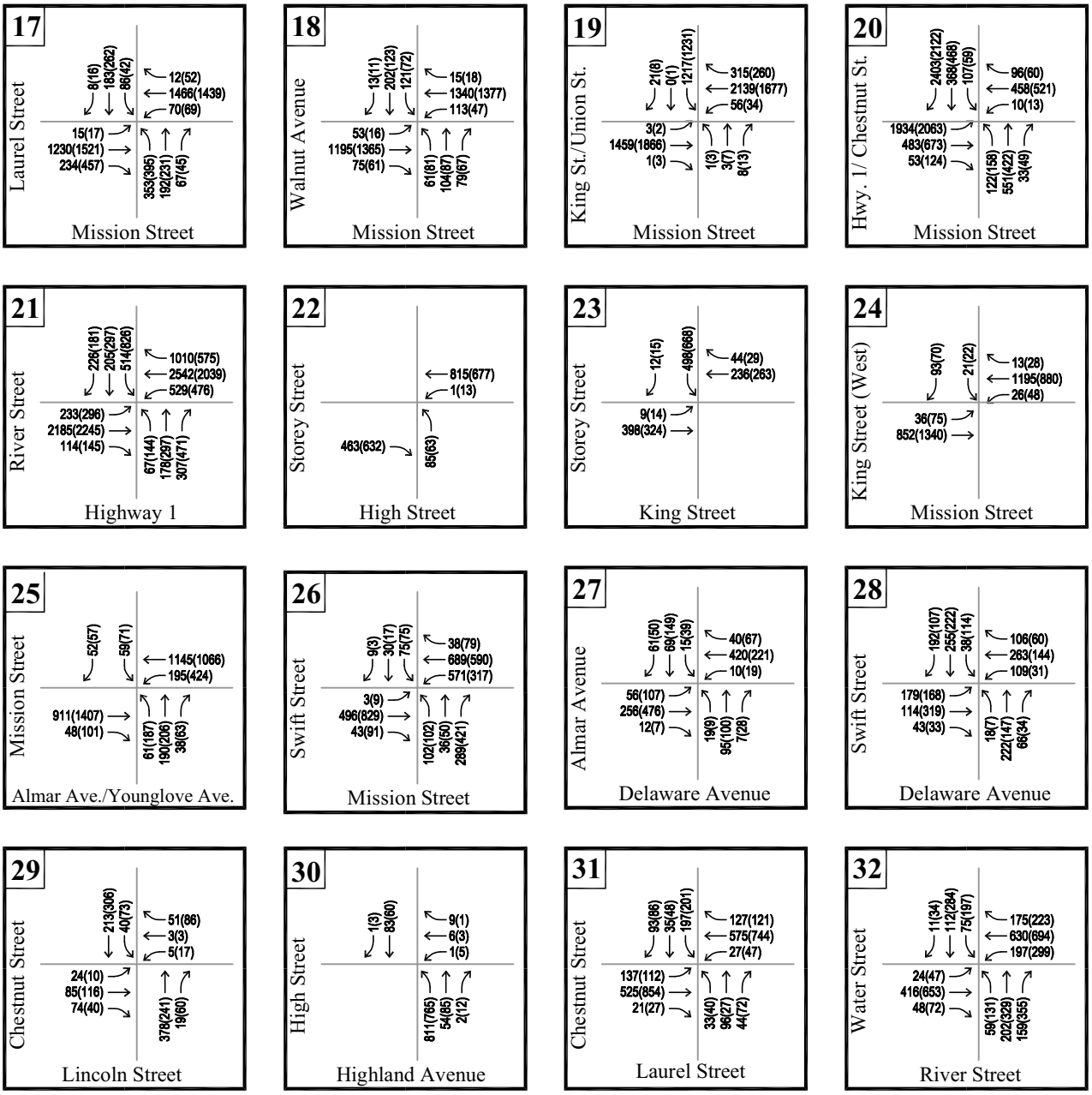
2020 WITH PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-10a



LEGEND	
X	STUDY AREA INTERSECTIONS
XX(YY)	AM(PM) PEAK HOUR VOLUMES

Source: Kimley-Horn & Associates

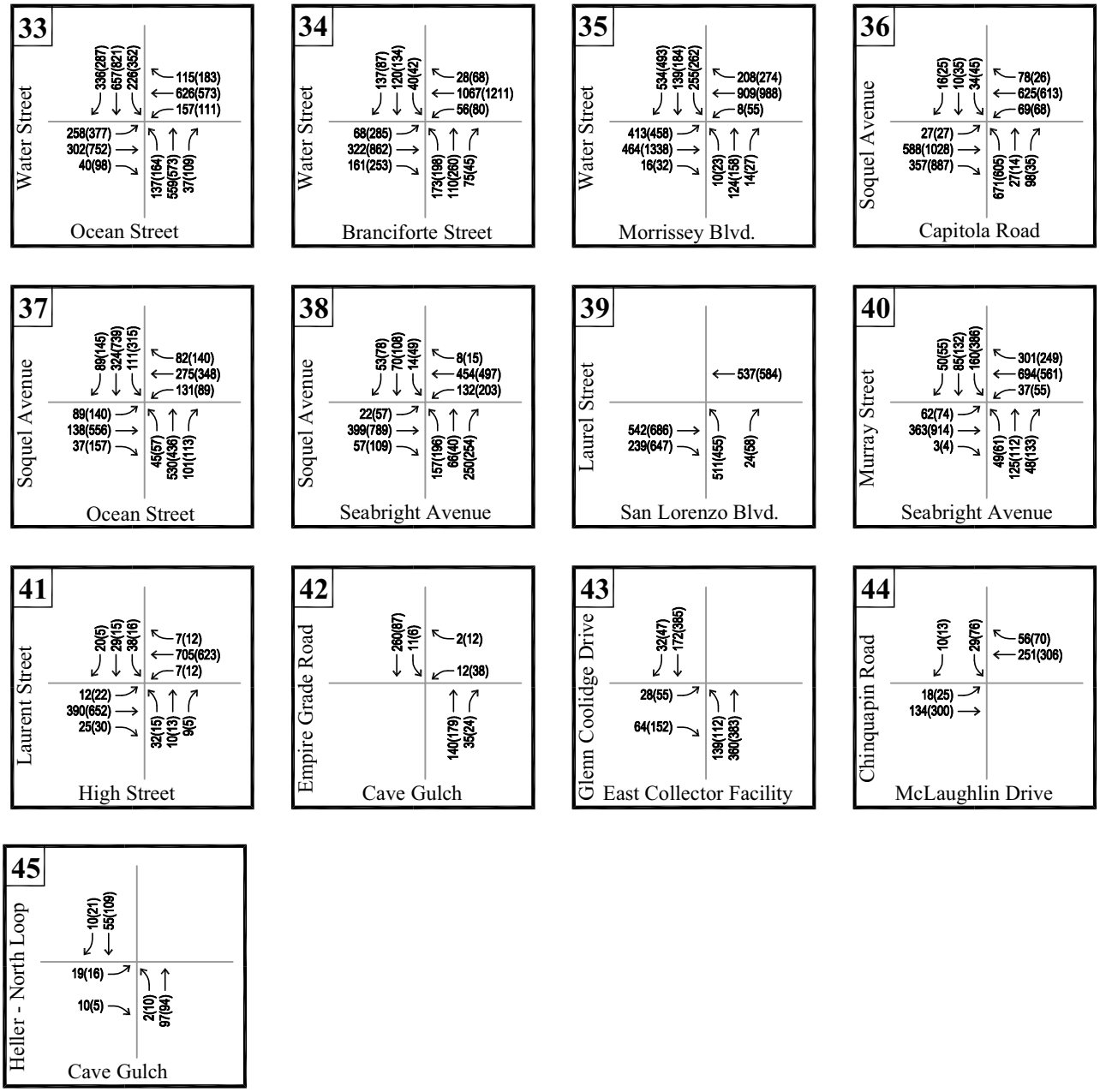
2020 WITH PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-10b



Source: Kimley-Horn & Associates

2020 WITH PROJECT INTERSECTION VOLUMES

October 2005
28649607

UC Santa Cruz LRDP EIR
Santa Cruz, California

URS

FIGURE 4.14-10c