3.4 TRANSPORTATION

Introduction

This section of the EIR analyzes transportation impacts resulting from the implementation of the proposed project. The information is based on current traffic movement surveys and computer models produced for this EIR by Fehr & Peers Associates, Incorporated, Transportation Consultants. Potential impacts to the roadway, bicycle, pedestrian, and parking systems are evaluated. Mitigation measures are suggested that would reduce or eliminate potential significant impacts of the project.

Setting

The project site and surrounding roadway network are shown on Figure 3.4-1. For the purpose of this report, US 101 is assumed to be oriented north-south. Veterans Boulevard, Bradford Street, and Marshall Street are all assumed to be oriented east-west.

Roadway Network

US 101 is a major north-south regional route on the west coast. It extends northward from Redwood City through San Francisco, Marin, and Sonoma Counties and continues into the states of Oregon and Washington. South of Redwood City, US 101 extends through San Jose and the California Central Coast into southern California. Near the project site, US 101 is generally an eight-lane freeway. South of Whipple Avenue and into Santa Clara County, one lane in each direction is restricted to high occupancy vehicles (carpools, van pools, buses, and motorcycles) during the commute hours. Access to the project site from US 101 would be accommodated via interchanges at Whipple Avenue and Woodside Road (State Route (SR) 84).

Woodside Road (SR 84) is a four- to six-lane arterial roadway between I-280 and US 101. West of I-280 to SR 1, Woodside Road becomes a two-lane rural highway. East of US 101, Woodside Road becomes Seaport Boulevard. The Woodside Road/Seaport Boulevard interchange with US 101 is a major access point for Redwood City and Woodside Road is the only major east-west high-capacity facility through the City. A grade-separated interchange is provided at El Camino Real.

El Camino Real (SR 82) is a four-lane arterial roadway and is one of the primary commercial corridors in the City. El Camino Real begins in Santa Clara County and extends north, through Redwood City, and into San Francisco. In Redwood City, El Camino Real includes an interchange with Woodside Road.

Insert Figure 3.4-1: Site Location

Veterans Boulevard is an east-west, six-lane, divided arterial roadway extending south from Whipple Avenue to Chestnut Street. Between Chestnut Street and Woodside Road, Veterans Boulevard becomes two-lanes. The northern and southern termini of this street are a southbound off-ramp and on-ramp to US 101, respectively. Veterans Boulevard provides direct access to the project site.

Whipple Avenue is a two-lane collector from Alameda de las Pulgas to El Camino Real and a four-lane arterial roadway from El Camino Real to US 101. East of US 101, Whipple Avenue turns to the south and becomes East Bayshore Road, a two-lane collector roadway. Whipple Avenue includes an at-grade crossing of the Caltrain railroad tracks just east of El Camino Real. Whipple Avenue also includes an interchange at US 101.

Main Street is a two lane roadway beginning at Veteran Boulevard and terminating at El Camino Real.

Walnut Street is a mostly two-lane, east-west, local roadway beginning at Stambaugh Street and terminating east of Veterans Boulevard. For one block on either side of Veterans Boulevard, Walnut Street is four lanes. Walnut Street would also provide direct access to a portion of the project site.

Maple Street is a two-lane local roadway beginning at El Camino Real and extending eastward over US 101. Maple Street terminates east of its intersection with Blomquist Street.

Bradford Street is a local, two-lane, north-south roadway. Bradford Street begins at Arguello Street and extends south to Walnut Street where it terminates.

Marshall Street is a two-lane local roadway. It begins at Chestnut Street and extends northward to its terminus at Broadway.

Bicycle and Pedestrian Facilities

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths are paved trails that are separated from roadways. Bike lanes are lanes on roadways designated for use by bicycles by striping, pavement legends, and signs. Bike routes are roadways that are designated for bicycle use with signs but do not necessarily include any additional pavement width. Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals. A limited number of bicycle facilities are located near the project site. Bike lanes are provided on Main Street east of Veterans Boulevard, and a multi-use path is located east of US 101 in the Bair Island Refuge Area. Otherwise, bicycles share the roadway with automobiles.

Near the project site, sidewalks are provided on both sides of Veterans Boulevard from Chestnut Street to Whipple Avenue. There are sidewalks on both sides of Main Street, Bradford Street, Marshall Street, Marshall Court, Walnut Street, and Maple Street in the vicinity of the project site.

Transit Facilities

Transit service in San Mateo County is provided by San Mateo County Transit District (SamTrans). Commuter rail service (Caltrain) between San Jose and San Francisco is provided by the Peninsula Corridor Joint Powers Board. During peak commute periods, Caltrain provides extended service to Morgan Hill and Gilroy located in southern Santa Clara County. Kaiser also operates two shuttle systems to minimize vehicle trips. Each transit service is described below.

SamTrans Service. Route 270 provides direct access to the project site. Route 270 is a local bus route operating between the Redwood City Caltrain Station and Marsh Road via El Camino Real, Jefferson Avenue, Veterans Boulevard, Maple Street, Blomquist Street, and East Bayshore Road in Redwood City. Route 270 operates from 6:30 am until 7:00 pm on one-hour headways and travels in a clockwise direction in the morning and counterclockwise in the afternoon. Limited service is provided during commute periods only on Seaport Boulevard to the Seaport Plaza development area. Saturday service is provided between 9:30 am and 6:15 pm at 60-minute headways. There is no Sunday service. Existing stops on Veterans Boulevard are located mid-block between Walnut Street and Maple Street.

Caltrain Service. The closest Caltrain station is the Redwood City Caltrain Station, located approximately ¾ of a mile from the project site. Caltrain operates from 4:30 am until 1:30 am on 15- to 60-minute headways during the weekday. Weekend service has been suspended until May 2004 to allow for construction of improvements to the rail line. Although substitute bus service (Route RRX) is being provided, the closest stop is provided at the Caltrain station in Palo Alto.

Shuttle Service. Kaiser operates two shuttle services. One of the shuttles provides service between the Redwood City Caltrain Station and the Medical Center. The second shuttle provides service within the Medical Center. These services are described in greater detail below.

Kaiser Permanente Medical Center/1400 Veterans Boulevard Shuttle. This shuttle service operates Monday through Friday between the Caltrain station and the Medical Center. The morning route operates from 7:32 to 9:02 am on approximately 15-minute headways. The shuttle is "on-call" from 9:02 am until 3:45 pm. The evening route then operates from 3:52 pm to 5:17 pm on approximately 15-minute headways. The shuttle is then "on-call" from 6:00 pm until 10:00 pm.

Aspen Building/1400 Veterans Boulevard Shuttle. This shuttle is an intra-campus shuttle that operates Monday through Friday. The shuttle operates from 6:30 am to 8:55 am and from 3:00 pm to 5:30 pm on 15-minute headways. The shuttle is "on-call" between the hours of 9:00 am to 3:00 pm and 5:30 pm to 7:00 pm.

Study Intersections

Intersections, rather than midblock roadway segments, are almost always the critical capacity-controlling locations for urban and suburban roadway networks. Fourteen study intersections were selected with input from city staff as locations to include in the transportation analysis.

The study intersections identified by City staff for inclusion in this analysis include:

1. Walnut Street/Marshall Street
2. Marshall Court/Marshall Street
3. Maple Street/Marshall Street
4. Chestnut Street/Marshall Street
5. Main Street/Bradford Street
6. Walnut Street/Bradford Street
7. Whipple Avenue/Veterans Boulevard
8. Jefferson Avenue/Veterans Boulevard
9. Main Street/Veterans Boulevard
10. Walnut Street/Veterans Boulevard
11. Maple Street/Veterans Boulevard
12. Hansen Way/Veterans Boulevard
13. Chestnut Street/Veterans Boulevard
14. Woodside Road/Veterans Boulevard

The locations of the 14 study intersections are shown on Figure 3.4-2. Figure 3.4-3 illustrates the existing lane configurations and associated traffic control devices (i.e., traffic signal or stop signs) at each study intersection.

Existing Traffic Volumes

The operations of the key intersections were analyzed under weekday morning (AM) and evening (PM) peak-hour traffic conditions. Peak conditions usually occur during the morning and evening commute periods between 7:00 and 9:00 am and 4:00 and 6:00 pm, respectively. Intersection operations were evaluated using the highest one-hour volume counted during each of these periods. Recent traffic counts were obtained at four of the study intersections from the *Marina Shores EIR* analysis conducted by Fehr & Peers Associates. These counts were supplemented with new counts in July 2002. Figure 3.4-4 presents the existing AM and PM peak-hour turning movement counts at the study intersections. The raw count data is available for review at the City's Community Development Services Department.

Intersection Analysis Methodologies

The operations of roadway facilities are described with the term *level of service*. Level of service (LOS) is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, as the best operating conditions, to LOS F, as the worst operating conditions. LOS E represents "at capacity" operations. When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F. Redwood City has defined LOS D as the minimal acceptable operation for an intersection.

Analysis of Signalized Intersections. The operations of the signalized study intersections were calculated using the methodology described in Chapter 16 of the *2000 Highway Capacity Manual (HCM)* (Transportation Research Board). This methodology correlates the LOS to the average control delay experienced at the intersection in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration. The average delay for the signalized intersections, as calculated using the TRAFFIX analysis software, is correlated to an LOS designation as summarized in Table 3.4-1.

Insert Figure 3.4-2: Study intersection locations

Insert Figure 3.4-3: Lane Configurations

Insert Figure 3.4-4: Existing Peak-Hour Volumes

Table 3.4-1
Signalized Intersection Level of Service Definitions

Level of Service	Description	Average Control Delay in Seconds/Vehicle
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	$\leq$ 10
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10 and $\leq$ 20
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20 and $\leq$ 35
D	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.	> 35 and $\leq$ 55
E	Operations with high delay volumes indicating poor progression, long cycle length, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55 and $\leq$ 80
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80

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

Note: V/C = Volume to Capacity Ratio.

Analysis of Unsignalized Intersections. For unsignalized (four-way stop-controlled and side-street stop-controlled) intersections, the LOS calculations were conducted using the methodology contained in Chapter 17 of the *2000 Highway Capacity Manual*. The LOS rating is based on the average control delay expressed in seconds per vehicle. At two-way or side street stop-controlled intersections, level of service is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. At four-way stop-controlled intersections, LOS is based on the average delay experienced on all approaches. Table 3.4-2 summarizes the relationship between delay and LOS for unsignalized intersections.

Existing Intersection Level of Service. The existing lane configurations and the peak-hour turning movement volumes were used to calculate the LOS for the study intersections during the AM and PM peak hours. The results of the LOS analysis under existing conditions are presented in Table 3.4-3.

Table 3.4-2
Unsignalized Intersection Level of Service Definitions

Level of Service	Description	Average Control Delay in Seconds/Vehicle
A	Little or no delay.	< 10
B	Short traffic delays.	> 10 and < 15
C	Average traffic delays.	> 15 and < 25
D	Long traffic delays.	> 25 and < 35
E	Very long traffic delays.	> 35 and < 50
F	Extreme traffic delays with intersection capacity exceeded.	> 50

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

Table 3.4-3
Intersection Level of Service Summary – Existing Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
#1 Walnut Street/Marshall Street	Stop-Control	10.7	B	10.8	B
#2 Marshall Court/Marshall Street	Stop-Control	9.8	A	10.6	B
#3 Maple Street/Marshall Street	Stop-Control	9.1	A	10.1	B
#4 Chestnut Street/Marshall Street	Stop-Control	11.0	B	13.1	B
#5 Main Street/Bradford Street	Stop-Control	12.1	B	14.3	B
#6 Walnut Street/Bradford Street	Stop-Control	7.7	A	8.2	A
#7 Whipple Avenue/Veterans Boulevard	Traffic Signal	35.8	D	35.6	D
#8 Jefferson Avenue/Veterans Boulevard	Traffic Signal	15.1	B	26.4	C
#9 Main Street/Veterans Boulevard	Traffic Signal	18.1	B	30.2	C
#10 Walnut Street/Veterans Boulevard	Traffic Signal	21.1	C	33.2	C
#11 Maple Street/Veterans Boulevard	Traffic Signal	21.5	C	32.0	C
#12 Hansen Way/Veterans Boulevard	Stop-Control	18.9	C	23.9	C
#13 Chestnut Street/Veterans Boulevard	Traffic Signal	15.7	B	16.2	B
#14 Woodside Road/Veterans Boulevard	Traffic Signal	21.1	C	40.1	D

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the 2000 Highway Capacity Manual, Transportation Research Board.
2. Level of service.

The results of the analysis indicate that all study intersections are operating at an acceptable level (LOS D or better) during the AM and PM peak hours under existing conditions.

Freeway Ramp Merging/Diverging Analysis

In addition to analyzing the 14 study intersections, a merging, diverging, and weaving analysis was conducted at the US 101/Whipple Avenue and US 101/Woodside Road interchanges. A freeway capacity analysis was also conducted on segments of US 101.

The ramp merging and diverging analyses on freeway segments were conducted using the 2000 Highway Capacity Software (HCS) package. The software is consistent with the methodologies contained in Chapters 24 and 25 of the *2000 Highway Capacity Manual*. This methodology correlates the LOS to the expected density of vehicles in passenger cars per mile per lane. Table 3.4-4 summarizes the relationship between density and LOS for freeway ramps.

Table 3.4-4
Freeway Ramp Merging and Diverging Level of Service Definitions

Level of Service	Density (pc/mi/ln)
A	$\leq$ 10.0
B	> 10.0 and $\leq$ 20.0
C	> 20.0 and $\leq$ 28.0
D	> 28.0 and $\leq$ 35.0
E	$\geq$ 35.0
F	Demand Exceeds Capacity

Source: Transportation Research Board, *Highway Capacity Manual*, 2000. Density in passenger cars per mile per lane.

Existing Freeway Ramp Merging and Diverging Levels of Service. Existing ramp volumes, freeway mainline volumes, free-flow speeds, merging/diverging lengths, and proximity to upstream/downstream ramps were used as inputs to calculate existing LOS at the freeway ramps. The results of the ramp merging and diverging analysis are presented in Table 3.4-5.

Freeway Segment Analysis

To evaluate project impacts on freeway segments, a capacity analysis was conducted. For the purpose of this analysis, a freeway segment is considered to operate acceptably if the volume of vehicles using the segment is less than that segment's capacity. Mixed-flow lanes were analyzed separately from high occupancy vehicle (HOV) lanes. A capacity of 2,300 vehicles per lane per hour (vplph) was used for mixed-flow lanes, while a capacity of 1,800 vplph was used for HOV lanes.

Table 3.4-5
Freeway Ramp Merging/Diverging Level of Service Summary – Existing Conditions

	AM Peak Hour		PM Peak Hour	
Merge/Diverge	**Density[1]**	**LOS[2]**	**Density[1]**	**LOS[2]**
Southbound US 101 Off-Ramp/Veterans Boulevard	39.3	E	37.0	E
Northbound US 101 On-Ramp/Whipple Avenue	33.7	D	37.5	E
Southbound US 101 On-Ramp/Woodside Road	39.3	F	37.3	E
Northbound US 101 Off-Ramp/Woodside Road	23.5	C	29.4	D

Source: Merging and Diverging LOS evaluated using the *2000 Highway Capacity Software* (HCS) package.

Notes:
1. Density is presented in passenger cars per mile per lane (pc/mi/ln).
2. Level of Service.

Existing Freeway Segment Levels of Service. Conditions along county freeways are periodically reported by the San Mateo City and County Association of Governments (C/CAG) as part of their Congestion Management Program (CMP). Existing freeway segment operating levels were obtained from the *2001 San Mateo County CMP Monitoring Report* (Fehr & Peers Associates, 2002). The operating levels presented in the CMP Monitoring Report are based on travel time surveys and the LOS is correlated to speed. The current status of freeway operating conditions is presented in Table 3.4-6.

Table 3.4-6
US 101 Freeway Segment Level of Service Summary – Existing Conditions

Freeway Segment	**Lane Type**	**AM Peak Hour LOS[1]**	**PM Peak Hour LOS[1]**
Southbound US 101 from State Route 92 to Whipple Avenue	Mixed-Flow	F	F
SouthBound US 101 from Whipple Avenue to Marsh Road	Mixed-Flow	F	D
	HOV[2]	E	B
North Bound US 101 from Marsh Road to Whipple Avenue	Mixed-Flow	F	D
	HOV[2]	B	B
North Bound US 101 from Whipple Avenue to State Route 92	Mixed-Flow	B	F

Source: From the *2001 San Mateo County CMP Monitoring Report* (Fehr & Peers Associates, 2002).

Notes:
1. Level of Service.
2. High Occupancy Vehicle Lanes.

As shown, during the AM peak hour, the mixed-flow lanes of southbound US 101 operate at unacceptable levels (LOS F) between SR 92 and Marsh Road and the mixed-flow lanes of northbound US 101 operate at unacceptable levels between Marsh Road and Whipple Avenue. During the PM peak, the mixed-flow lanes of southbound US 101 operate at unacceptable levels between SR 92 and Whipple Avenue and the mixed-flow lanes of northbound US 101 operate at unacceptable levels between Whipple Avenue and SR 92.

Applicable Plans and Regulations

This section of the EIR discusses agencies with jurisdiction over transportation facilities and services in Redwood City, and plans and policies that could affect the proposed project.

Agencies with Jurisdiction in Redwood City. The City of Redwood City has jurisdiction over all city streets and city-operated traffic signals. Several regional agencies, including the City/County Association of Governments of San Mateo County (C/CAG), the congestion management agency in San Mateo County, and the Metropolitan Transportation Commission (MTC) coordinate and establish funding priorities for intra-regional transportation improvement programs. Freeways in Redwood City (US 101 and I-280), freeway ramps, and designated State Routes 82 (El Camino Real) and 84 (Woodside Road) are under the jurisdiction of the State of California Department of Transportation (Caltrans). Transit service providers such as Caltrain, SamTrans, and the Water Transportation Authority (the agency responsible for providing ferry service) have jurisdiction over their respective services. These agencies, their responsibilities, and funding sources are more specifically described below.

City of Redwood City. The City of Redwood City is responsible for planning, constructing, and maintaining local public transportation facilities, including all city streets, city-operated traffic signals, sidewalks, and bicycle facilities. These local services are funded primarily by gas-tax revenue and developer fees.

San Mateo City/County Association of Governments (C/CAG). C/CAG is the Congestion Management Agency (CMA) that sets State and federal funding priorities for improvements affecting the San Mateo County Congestion Management Program (CMP) roadway system. C/CAG-designated CMP roadway system components in Redwood City include SR 82 (El Camino Real), SR 84 (Woodside Road), US 101, and I-280. C/CAG-designated CMP intersections in or near Redwood City include El Camino Real/Whipple Avenue, Bayfront Expressway/Marsh Road (borders Redwood City), and Woodside Road/Middlefield Road.

C/CAG has adopted guidelines to reduce the number of net new vehicle trips generated by new developments. These guidelines apply to all developments that generate 100 or more net new peak period trips on the CMP network and are subject to CEQA review. These guidelines ensure that "the

developer and/or tenants will reduce the demand for all new peak hour trips (including the first 100 trips) projected to be generated by the development."[1]

Metropolitan Transportation Commission (MTC). The regional transportation planning agency for the Bay Area is the Metropolitan Transportation Commission (MTC). MTC is the clearinghouse for State and federal funds for transportation improvements. Each county's CMA, including C/CAG, forwards a capital improvement project list to MTC. MTC reviews the lists submitted by all nine Bay Area counties and submits a regional priority list to the California Transportation Commission (CTC) and/or the Federal Highway Administration (FHWA) for selection of projects to receive funding. Funded projects are included in the Regional Transportation Plan (RTP) prepared by MTC.

California Department of Transportation (Caltrans). Caltrans has authority over the State highway system including mainline facilities, interchanges, and arterial state routes. Caltrans approves the planning and design of improvements for all state-controlled facilities. The facilities in Redwood City include US 101 and its interchanges at Whipple Avenue and Woodside Road, SR 82 (El Camino Real), and SR 84 (Woodside Road), including the El Camino Real/Woodside Road interchange.

Plans and Policies. There are several agencies that have plans and policies in place that affect transportation in Redwood City relevant to the proposed project. These plans and policies are described and summarized below.

Redwood City Strategic General Plan. The Redwood City Strategic General Plan Circulation Element (adopted in 1990, revised in 1993) contains the following relevant transportation- and circulation-related objectives and policies:

- Allow for the safe and convenient movement and access of motor vehicles in Redwood City, but not at the expense of the environment or the overall quality of life in Redwood City or to the detriment of alternative transportation modes. (Motor Vehicle Transportation Objective 1, page 7-7.)
- Local road projects that are not part of the State Highway System shall not be included in the Circulation Element if one or more of the following impacts are likely to result:
  - Increases road capacity, thereby encouraging increased through automobile traffic;
  - Requires a substantial acquisition of land;
  - Results in a substantial loss of housing and/or business;
  - Encroaches into environmentally sensitive areas, such as open space and wetlands, resulting in a substantial loss of these areas;
  - Routes increased traffic through residential neighborhoods; or

[1] From *Revised C/CAG Guidelines for the Implementation of the Land Use Component of the 1999 Congestion Management Program,* C/CAG (Walter Martone), October 11, 2000.

- Is extremely costly in terms of benefits achieved. (Motor Vehicle Transportation Objective 2, page 7-7.)

- Participate in formulating and supporting the goals and policies of the Congestion Management Plan for San Mateo County by cooperating with adjacent jurisdictions so as to more effectively deal with traffic congestion and traffic impacts. (Motor Vehicle Transportation Policy MV-2, page 7-7.)

- Create conditions to allow for better utilization of the existing public transportation system that will increase public transportation use and the subsequent improvement of the public transportation infrastructure and expansion of service. (Public Transportation Objective 1, page 7-13.)

- Establish site planning and architectural standards for new building projects that would incorporate transit access and orientation. Such standards would apply to both public and private building projects located along existing bus routes to enhance pedestrian access and convenient public transit access. (Public Transportation Policy PT-4, page 7-14.)

- Make walking and bicycling a realistic and more widespread transportation alternative in Redwood City by establishing a series of policies to create an urban environment that will make walking and bicycling safe, efficient, and convenient. (Non-Motorized Transportation Objective, page 7-26.)

- Designate areas for mixed use and higher density residential development to create pedestrian-oriented environments. This policy shall complement the policies in the Public Transportation section as they pertain to land use. (Non-Motorized Transportation Policy NM-1, page 7-26.)

- Minimum standards for sidewalk widths shall be maintained. Loss of sidewalk surface due to encroachment and/or the installation of poles, street furniture, and/or other utility hardware shall be avoided. If any sidewalk surface is lost to these or other uses, additional sidewalk surface shall be provided that is equal to or more than the amount of sidewalk surface lost. (Non-Motorized Transportation Policy NM-3, page 7-26.)

- Provide and maintain continuity to the existing bikeway system within Redwood City by eliminating missing segments in the system. Bikeway continuity shall also be provided, whenever possible, through such means as eliminating parking on one or both sides of the street and/or through street modification. If these measures are not feasible, the posting of appropriate signs and pavement markings shall be required. (Non-Motorized Transportation Policy NM-8, page 7-27.)

- All new traffic signal installations and existing traffic signal modifications shall include installation of bicycle-sensitive signal detector loops. (Non-Motorized Transportation Policy NM-11, page 7-27.)

C/CAG Guidelines for the Implementation of the Land Use Component of the 1999 Congestion Management Program (CMP). C/CAG, the Congestion Management Agency (CMA) in San Mateo

County, has adopted guidelines for the land use component of the CMP. The purpose of the guidelines is to reduce the impacts of the traffic created as a result of new development. The guidelines must be followed for all projects that generate 100 or more net new peak period trips on the CMP network and are subject to CEQA review. If a project meets the above-mentioned criteria, the project sponsor should determine if a combination of acceptable options/measures will fully reduce the net number of trips that the project is anticipated to generate on the CMP roadway network (including the first 100 trips). The plan is included in Appendix F of this Draft EIR and will be reviewed by C/CAG staff and ultimately adopted by the Redwood City Council. If an agreement is not reached with C/CAG staff on the plan, an immediate review by the C/CAG Board will be scheduled so that the local jurisdiction project approval process will not be delayed.

Impacts and Mitigation Measures

Significance Criteria

According to State CEQA Guidelines, a project typically results in a significant impact if it causes an increase in traffic that is substantial and adverse in relation to the traffic load and capacity of the existing street system. This standard of significance relates to automobile traffic only and does not address the potential effects on other travel modes including transit, bicycle, and pedestrian facilities. In order to evaluate a broad range of travel characteristics, the following standards of significance apply to the transportation impacts discussed in this EIR. These standards are consistent with recent transportation/circulation sections prepared for other EIRs in Redwood City.

Intersection Impacts. According to Redwood City standards, traffic impacts at intersections are defined to occur when the addition of project traffic causes:

- Operations at a signalized intersection to deteriorate from an acceptable level (LOS D or better) to an unacceptable level (LOS E or F); or
- The average delay at a signalized intersection operating at an unacceptable level (LOS E or F) to increase by five (5) or more seconds; or
- Operations at an unsignalized intersection to deteriorate from an acceptable level (LOS D or better) to an unacceptable level (LOS E or F) *and* the traffic volumes at the intersection satisfy the Caltrans Peak Hour Volume warrant for traffic signal installation; or
- The delay at an unsignalized intersection operating at an unacceptable level (LOS E or F) to increase by five or more seconds *and* the traffic volumes at the intersection satisfy the Caltrans Peak Hour Volume warrant for traffic signal installation.

Freeway Segment Impacts. For the purposes of this EIR, traffic impacts on the surrounding freeway segments are defined to occur when the addition of project traffic causes:

- The volume on the freeway segment to exceed its capacity; or

- Increases the amount of traffic on a freeway segment already exceeding its capacity by adding more than one percent of the freeway segment's capacity to that segment.

Freeway Ramp Merging and Diverging Impacts. The proposed project is considered to result in a significant freeway ramp merging or diverging impact if its implementation:

- Causes the LOS of a freeway ramp to degrade from an acceptable LOS (LOS D or better) to an unacceptable LOS (LOS E or LOS F); or
- Adds any traffic to a freeway ramp operating at an unacceptable level (LOS E or LOS F).

Freeway Ramp Capacity Impacts. The proposed project is considered to result in a significant freeway ramp capacity impact if its implementation:

- Causes the volume-to-capacity ratio (V/C) of the freeway ramp to exceed 1.0; or
- Adds any traffic to a freeway ramp with a V/C greater than 1.0.

Transit, Bicycle and Pedestrian Impacts. The proposed project is considered to result in a significant transit, bicycle, and/or pedestrian impact if its implementation:

- Conflicts with any existing, planned, or possible future transit, bicycle and/or pedestrian facilities and services; or
- Causes transit, bicycle, or pedestrian facilities to be frequently blocked by cars or other potential safety obstruction hazards; or
- Causes vehicles to cross pedestrian or bicycle facilities on a regular basis at driveway entrances lacking adequate sight distance or warning systems; or
- Encourages pedestrians to cross roads in undesignated areas.

Background Conditions (Baseline for Project Traffic Analysis)

Background Conditions are defined as conditions prior to completion of the proposed development. Traffic volumes for Background Conditions include existing volumes from counts plus traffic generated by approved developments in the area. Approved developments are defined as approved projects that are not yet constructed. Background Conditions serve as the baseline scenario against which project impacts are identified. Typically, background conditions are correlated to a two- to three-year horizon (or Year 2005-2006) when MOB 1 and the replacement hospital are expected to be at or near completion.

Background Roadway Improvements. There are no near-term intersection improvements planned at the study intersections within the next several years. However, there is a planned improvement to add auxiliary lanes to US Highway 101 from Ralston Avenue in the City of Belmont to Marsh Road in the City of Menlo Park. This improvement would link the on-ramp from the upstream interchange to the off-ramp at the downstream interchange with a continuous freeway lane. This improvement will create

a "weaving" maneuver on US 101 where vehicles entering and exiting the freeway via the auxiliary lane would cross each other.

Background Traffic Estimates. The traffic volumes for Background Conditions were estimated by adding traffic from approved but not yet constructed or occupied developments to existing conditions volumes obtained from counts. Appendix G contains the list of approved projects, their associated trip generation estimates, and their projected volumes at the study intersections. The expected volumes under Background Conditions are presented in Figure 3.4-5.

Background Intersection Level of Service. LOS was calculated for the study intersections using background traffic volumes and existing lane configuration (no intersection improvements were identified by City staff for inclusion in the Background Conditions analysis). Table 3.4-7 presents the LOS results under Background Conditions.

Table 3.4-7
Intersection Level of Service Summary – Background Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
#1 Walnut Street/Marshall Street	Stop-Control	10.7	B	10.8	B
#2 Marshall Court/Marshall Street	Stop-Control	9.8	A	10.6	B
#3 Maple Street/Marshall Street	Stop-Control	9.5	A	11.1	B
#4 Chestnut Street/Marshall Street	Stop-Control	11.0	B	13.1	B
#5 Main Street/Bradford Street	Stop-Control	12.1	B	14.3	B
#6 Walnut Street/Bradford Street	Stop-Control	7.7	A	8.2	A
#7 Whipple Avenue/Veterans Boulevard	Traffic Signal	36.3	D	36.7	D
#8 Jefferson Avenue/Veterans Boulevard	Traffic Signal	15.7	B	28.3	C
#9 Main Street/Veterans Boulevard	Traffic Signal	18.2	B	29.1	C
#10 Walnut Street/Veterans Boulevard	Traffic Signal	21.0	C	32.2	C
#11 Maple Street/Veterans Boulevard	Traffic Signal	23.3	C	32.8	C
#12 Hansen Way/Veterans Boulevard	Stop-Control	20.0	C	27.4	D
#13 Chestnut Street/Veterans Boulevard	Traffic Signal	15.7	B	17.8	B
#14 Woodside Road/Veterans Boulevard	Traffic Signal	22.4	C	41.9	D

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the *2000 Highway Capacity Manual*, Transportation Research Board.
2. Level of service.

Insert Figure 3.4-5: Background Condition Volumes

The results of the LOS analysis under Background Conditions indicate that all of the study intersections are expected to maintain acceptable operations (LOS D or better) during the AM and PM peak hours.

The addition of approved projects in the area is expected to increase the average delay at most of the study intersections. However, approved projects that are expected to add traffic to non-critical intersection turning movements actually slightly decreases the overall average delay per vehicle at some of the study intersections.

Background Freeway Segment Capacity Analysis. Segments of US 101 were reviewed to assess the freeway's capacity after the US 101 auxiliary lane project has been completed. South of Whipple Avenue in the study area, US 101 is expected to have one HOV lane, three mixed-flow lanes, and one auxiliary lane in each direction. North of Whipple Avenue, US 101 is expected to have four mixed-flow lanes and one auxiliary lane (no HOV lanes) in each direction. The addition of auxiliary lanes under this scenario will improve operations compared to existing conditions.

Existing freeway segment operations shown in Table 3.4-6 are based on speed and travel time surveys from the San Mateo County CMP. Since speed cannot be projected under future conditions (Background or otherwise), a capacity analysis was used as a baseline for identifying potential project impacts to the freeway system.

A capacity of 2,300 vehicles per lane per hour was used to estimate the capacity of the mixed-flow lanes on US 101. The HOV lanes were assumed to have a capacity of 1,800 vehicles per lane per hour. To estimate the number of vehicles using the HOV lanes, the existing percentage of HOVs on US 101 was obtained from the Measures of Effectiveness report presented in the *US 101 Auxiliary Lane Project Study* (Fehr & Peers Associates, November 2000).

Vehicles in the mixed-flow lanes wishing to exit the freeway via the auxiliary lane will occupy capacity in the mixed-flow lanes of US 101 for a portion of each study segment. Additionally, vehicles entering the freeway from the auxiliary lanes will occupy capacity in the mixed-flow lanes of US 101 for only a portion of each study segment. For the mixed-flow lane capacity analysis, it was assumed that half of the total vehicles using the auxiliary lane would use capacity on the mainline section of US 101. The results of the freeway segment capacity analysis are summarized in Table 3.4-8.

The results of the freeway segment capacity analysis indicate that, during the AM peak hour, the volume of vehicles in the southbound US 101 mixed-flow lanes from Woodside Road to Marsh Road exceeds the freeway segment capacity. All other study segments have V/C ratios less than 1.0, where volume does not exceed capacity.

Table 3.4-8
US 101 Freeway Segment Capacity Analysis – Background Conditions

			AM Peak Hour		PM Peak Hour	
Freeway Segment	**Lane Type**	**Capacity[1]**	**Volume[2]**	**V/C[3]**	**Volume[2]**	**V/C[3]**
SB SR 92 to Whipple	Mixed-Flow	9,200	8,640	0.94	7,772	0.84
SB Woodside to Marsh	Mixed-Flow	6,900	7,720	1.12	6,388	0.93
	HOV	1,800	1,136	0.63	939	0.52
NB Marsh to Woodside	Mixed-Flow	6,900	5,187	0.75	4,001	0.58
	HOV	1,800	889	0.49	639	0.36
NB Whipple to SR 92	Mixed-Flow	9,200	7,008	0.76	6,274	0.68

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis. See text of description on how traffic in the auxiliary lanes was addressed in the analysis.
2. Volumes obtained from existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.

Background Freeway Ramp Capacity Analysis. The addition of auxiliary lanes to US 101 will affect the merging and diverging analysis conducted under existing conditions. The auxiliary lanes will provide a weaving section for vehicles entering and exiting US 101.

To analyze the operation of weaving segments in California, the nomograph presented in the Caltrans *2000 Highway Design Manual* (Figure 504.7A) is typically used to correlate weaving volume and length of the weaving section to an LOS. However, due to the proposed length of the auxiliary lanes on US 101, the nomograph indicates that weaving segment is "out of realm of weaving."

Discussions with Caltrans operations staff indicated that weaving segments on US 101 that are "sufficiently long" provide more than an adequate amount of space for drivers to find a gap and conduct the weaving maneuver. Thus, no further analysis of weaving is required.

To verify that the freeway ramps would have sufficient capacity to serve expected demand, a volume-to-capacity analysis was conducted for the ramp itself. For the purpose of this analysis, capacities presented in Chapter 25 of the *2000 Highway Capacity Manual* were used based on the free-flow speed of the study ramps. The results are presented in Table 3.4-9.

The results of the capacity analysis indicate that all of the study freeway ramps have sufficient capacity (i.e., V/C ratios are less than 1.0). It is important to note that the constraint point for ramps is typically the controlled or uncontrolled intersection at the end of the ramp.

Table 3.4-9
US 101 Freeway Ramp Capacity Analysis – Background Conditions

		AM Peak Hour		PM Peak Hour	
Weaving Segment	**Capacity[1]**	**Volume[2]**	**V/C[3]**	**Volume[2]**	**V/C[3]**
Southbound US 101 Off-Ramp/Veterans Boulevard	3,800	1,747	0.46	1,455	0.38
Northbound US 101 On-Ramp/Whipple Avenue	1,900	1,085	0.57	1,122	0.59
Southbound US 101 On-Ramp/Woodside Road	2,000	1,007	0.50	1,052	0.53
Northbound US 101 Off-Ramp/Woodside Road	1,900	1,284	0.68	1,265	0.67

Source: Fehr & Peers Associates, October 2002.

Notes:
1. Capacity based on information presented in Chapter 25 of the *2000 Highway Capacity Manual* and the posted recommended travel speed on the ramp.
2. Volumes obtained from existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.

Environmental Analysis

As described in Section 3.1, for each impact, a level of significance is determined and is reported in the impact statement. Conclusions of significance are defined as follows: significant (S), potentially significant (PS), less than significant (LTS), and no impact (NI). If the mitigation measures would not diminish potentially significant or significant effects to a less-than-significant level, the impacts are classified as "significant unavoidable effects (SU)." For this section, TR refers to Transportation.

Project-related impacts in the near term are those anticipated to occur with MOB 1 and the replacement Hospital (Background Conditions + Project). Full buildout of the Kaiser Medical Center Master Plan would occur in the long term and is evaluated in the context of cumulative development (Cumulative Conditions + Project). Because the traffic effects of the Higher Occupancy Scenario would only occur at buildout of the Kaiser campus when all phases have been completed, traffic and parking analyses of the Higher Occupancy Scenario are only relevant in the context of long-term cumulative development.

TR-1. Intersection Operations in the Near Term - *The proposed project would not significantly affect study area intersections. (LTS)*

Traffic projections for the proposed project were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In the first step, the amount of traffic added to the surrounding roadway system is estimated. In the second step, the directions the trips use to approach and depart the site are estimated. In the third step, the trips are assigned to specific street segments and intersection turning movements. The results of this process are described in the following sections.

Trip Generation. From a traffic perspective, the proposed project includes three components that could generate new vehicle trips: 1) expansion of the hospital building, 2) expansion of MOB space, and 3) relocation of administrative office staff from buildings in other parts of Redwood City to the project site (i.e., the existing campus). Each of these elements is discussed below.

Hospital Trips. The existing Redwood City Kaiser Hospital has 209 total beds. Kaiser's proposed project includes replacement of the existing hospital with a new, 192-bed hospital. The existing hospital is currently 50 percent occupied on average according to information provided by James Brinkley Company (the City's health care consultant) and Kaiser. Both indicate that the new hospital will be 75 percent occupied on average. While the increase in occupancy could occur even if Kaiser were to do nothing to its current facilities, to be conservative, this increased occupancy is assumed to be part of Kaiser's proposed project and thus are treated as project-related impacts.

Assuming that the existing hospital is currently 50 percent occupied, it has 104 occupied beds. The new hospital, assuming 75 percent occupancy, would have 144 occupied beds. Therefore, there would be 40 additional occupied beds.

Trip generation rates for hospitals as presented in the Institute of Transportation Engineers (ITE) *Trip Generation* (Sixth Edition) are based on trips per hospital bed. However, a trip rate per *occupied bed* is needed to estimate the number of new trips generated by the 40 additional occupied beds associated with the proposed project. Accordingly, the ITE rates (presented as trips per bed) were divided by 75 percent to develop trip rates per *occupied bed*. These rates were applied to the 40 additional occupied beds to estimate the number of new trips that would be generated by the increased occupancy. The trip generation estimates are presented in Table 3.4-10.

Emergency Room Trips. The existing emergency room provides care to approximately 24,000 patients annually. Information provided by James Brinkley Company and Kaiser indicate that the number of patients seen annually at the campus could increase to 43,000 annually in 2025. This equates to approximately 52 new patients per day, or five new patients during each peak hour (assuming that 10 percent of the patients visit during each peak hour, similar to the ratio of peak hour traffic to daily traffic volumes). To estimate the number of new trips generated by the five new patients during each peak hour, it was conservatively assumed that each patient would generate six new peak hour trips (two by the ambulance or private vehicle carrying the patient, and four by visiting relatives or friends). The trip generation estimates for emergency room trips are presented in Table 3.4-10.

Medical Office Trips. Based on conversations with Kaiser planning staff, MOB floor area is not a good indicator of trip generation because buildings are being made larger to accommodate new equipment and to meet current industry operating standards. Kaiser's intent is not to provide numerous new provider offices at the Medical Center. This direction is supported by Kaiser's projected increase in the number of providers (i.e., physicians primarily)

Table 3.4-10
Project Trip Generation Estimates[1]

		Weekday		AM Peak Hour				PM Peak Hour			
Land Use	**Size**	**Rate[2]**	**Trips**	**Rate[2]**	**In[3]**	**Out[3]**	**Total**	**Rate[2]**	**In[3]**	**Out[3]**	**Total**
Emergency Room	52 patients	6.0	312	0.60	16	15	31	0.60	15	16	31
Hospital	40 new occupied beds	15.7	628	1.43	41	16	57	1.63	22	43	65
MOB	23 new providers	95.0	2,185	10.9	125	127	252	8.6	113	85	198
Office	40,000 GSF	11.0	440	1.55	55	7	62	1.50	10	50	60
Total (Phase I and Buildout)			*3,565*	—	*237*	*165*	*402*	—	*160*	*194*	*354*

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Trip generation is for increases in hospital bed occupancy, emergency room visits, MOB space, plus relocated administrative staff from off-campus office space. See text for details. Kaiser expects highest trip generation during Phase I plus increased use of the hospital and emergency room.
2. Trip generation rates for emergency room in trips per patient. Rate estimated at six trips per patient. Trip generation rates for hospital are in trips per occupied bed. Trip rates developed by dividing trip rates presented in the Institute of Transportation Engineers' (ITE) Trip Generation, Sixth Edition, by 0.75 (average proportion of occupied beds based on information from James Brinkley Company (City consultant). Trip generation rates for MOBs in trips per provider based on rates developed from driveway counts conducted at the Roseville Kaiser MOB complex. Trip generation rates for office in trips per 1,000 s.f. from ITE Trip Generation, Sixth Edition.
3. Inbound and outbound splits from counts conducted at the Roseville Kaiser MOB complex and ITE. Number of trips are net new trips over existing trip generation.

from 125 under existing conditions to 148 at project buildout. In addition, Kaiser projects the number of on-site staff to remain essentially the same. The largest increase in staff is expected at off-site clinics located outside Redwood City that would not result in a traffic impact to city streets. Since the number of patients, staff, and other facilities (e.g., pharmacies, laboratories, etc.) is generally tied to the number of providers, a more appropriate independent variable for estimating trip generation at the MOBs is the number of providers.

To estimate trip generation for the MOBs, use of standard trip rates per 1,000 square feet for Medical-Dental Office Building (Land Use Code 720) from *Trip Generation* (Sixth Edition) published by ITE was initially considered. However, the ITE rates are based on an average facility size of 30,000 to 45,000 square feet, which according to the accompanying survey description "is generally operated by one or more private physicians or dentists." The proposed project includes an expansion of over 350,000 GSF of MOB space. As such, the ITE rate was not considered appropriate for application to the Kaiser proposal.

A more accurate method of estimating trip generation for the proposed project is to conduct a survey of a comparable facility. To that end, daily and peak hour counts were taken at an existing Kaiser clinic without a hospital in the City of Roseville located at Riverside Boulevard and Cirby Road near I-80. That facility was chosen because it offers services similar to those projected for MOB 1 and because transit and other non-automobile modes do not serve a significant number of trips generated by the site. Use of the Roseville facility as a surrogate for the Redwood City project results in a more conservative estimate of vehicle trip generation for the project site in Redwood City. Raw count data from the Roseville site show that the facility generated 6,840 daily trips, 787 AM peak hour trips, and 622 PM peak hour trips. Based on 72 providers at Roseville, the data resulted in a trip generation rate of 95 daily trips per provider, 10.9 AM peak hour trips per provider, and 8.6 PM peak hour trips per provider. These rates were applied to Kaiser's projected number of providers at the Redwood City campus.

The proposed project would be built in phases and the number of providers would change as new buildings are constructed. According to Kaiser, the number of on-campus providers would be the same under Phase I as under project buildout conditions, with lower numbers of on-campus providers expected during interim phases. It should be noted that according to Kaiser the number of on-campus staff (providers and both clinical and support staff) is expected to increase by 136 persons under Phase I, but at buildout Kaiser projects the number of on-campus staff members to be at the approximately the same as it is at the conclusion of Phase I. Based on all of this information, traffic generated under Phase I of Kaiser's proposed project is used in the transportation analysis to represent "the project." This assumption, based on Kaiser's projections, is conservative for the interim phases and is representative of development levels at project buildout.

As noted earlier in Section 2, Project Description, a Higher Occupancy Scenario has also been defined to acknowledge that Kaiser's projections of the future number of providers staff and patient visits at the Medical Center could potentially underestimated. Project trips under the Higher Occupancy Scenario are presented later in the cumulative condition analysis of this Section 3.4, Transportation.

Off-Site Administrative Trips. Kaiser currently occupies approximately 34,000 GSF of administrative office space in off-campus facilities. The proposed project includes relocating staff from those administrative spaces into on-campus facilities. The number of trips generated by on-campus administrative offices was estimated by applying trip generation rates for General Office Buildings (Land Use Code 710) from ITE *Trip Generation*, Sixth Edition. Since the off-campus space would eventually be occupied by others and would replace the Kaiser staff trips, no reduction in background traffic was assumed, which also provides a more conservative analysis.

Summary of Project Trip Generation. Based on Kaiser's phasing plan for the project, the highest increase in providers and staff would occur in the near term; that is, after Phase I of the proposed project has been completed, when 23 new providers (for a total of 148) and 111 new

staff members would be located onsite, plus relocated staff from the off-campus office space. To be conservative, it is assumed that the increase in the number of providers and the increased use of the hospital occur at the same time. Therefore, the trips generated by the increased occupancy of the hospital beds and the increased use of the emergency room are added to the trip generation estimates for Phase I to estimate the number of new trips generated by the "proposed project." Applying the trip rates discussed above, Kaiser's proposed project is estimated to generate 3,565 new daily trips, 402 new AM peak hour trips (237 inbound/165 outbound), and 354 new PM peak hour trips (160 inbound/194 outbound). The project trip generation estimates are presented in Table 3.4-10. The corresponding trips for the Higher Occupancy Scenario are presented in the cumulative discussion later in this section.

Trip Distribution. The directions of approach and departure for project trips were estimated based on existing travel patterns in the area, the relative locations of complementary land uses, and the project trip distribution used in the *City of Redwood City Kaiser TIS – Proposed MOB and Parking Garage* (TJKM, 1993). Data from the 1990 Census Transportation Planning Package that indicates place of residence and place of work was also reviewed. Unfortunately, 2000 census journey-to-work data is not expected to be available until Spring 2003. The trip distribution was reviewed by City staff and is presented on Figure 3.4-6.

In general, approximately 28 percent of the project traffic is distributed to the north on US 101 and El Camino Real; four percent is distributed to the east to the Bair Island and Pacific Shores areas; 46 percent is distributed to the south on East Bayshore Road, US 101, Broadway, Bay Street, Middlefield Road, and El Camino Real; and 22 percent is distributed to the west on Woodside Road, Jefferson Avenue, Broadway, and Whipple Avenue.

Trip Assignment. The number of new trips generated by the project was assigned to the roadway system based on the directions of approach and departure discussed above. Figure 3.4-7 presents the project trip assignment at each of the study intersections.

The project trips were added to intersection turning movement volumes under Background Conditions to estimate intersection turning movement volumes under Project Conditions. Project Condition volumes are presented on Figure 3.4-8.

Intersection Operations. The Project Condition volumes were used to conduct LOS calculations at the study intersections to analyze the potential impacts of Kaiser's proposed project on the local roadway system. The results of the calculations under Background and Project Conditions, including the change in average control delay, are presented in Table 3.4-11.

Insert Figure 3.4-6 – Trip Distribution

Insert Figure 3.4-7: Project Trip Assignment

Insert Figure 3.4-8: Project Condition Volumes

Table 3.4-11
Intersection Level of Service Summary –
Background and Project Conditions

Intersection	Peak Hour	Background Conditions		Project Conditions		Change in Average Delay[3]
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	
#1 Walnut Street/	AM	10.7	B	11.1	B	+0.4
Marshall Street (U)	PM	10.8	B	11.3	B	+0.5
#2 Marshall Court/	AM	9.8	A	10.3	B	+0.5
Marshall Street (U)	PM	10.6	B	11.1	B	+0.5
#3 Maple Street/	AM	9.5	A	10.0	B	+0.5
Marshall Street (U)	PM	11.1	B	11.9	B	+0.8
#4 Chestnut Street/	AM	11.0	B	11.4	B	+0.4
Marshall Street (U)	PM	13.1	B	13.6	B	+0.5
#5 Main Street/	AM	12.1	B	12.5	B	+0.4
Bradford Street (U)	PM	14.3	B	15.1	C	+0.8
#6 Walnut Street/	AM	7.7	A	7.9	A	+0.2
Bradford Street (U)	PM	8.2	A	8.3	A	+0.1
#7 Whipple Avenue/	AM	36.3	D	36.9	D	+0.6
Veterans Boulevard	PM	36.7	D	36.9	D	+0.2
#8 Jefferson Avenue/	AM	15.7	B	15.7	B	+0.0
Veterans Boulevard	PM	28.3	C	28.0	C	– 0.3
#9 Main Street/	AM	18.2	B	18.6	B	+0.4
Veterans Boulevard	PM	29.1	C	28.8	C	– 0.3
#10 Walnut Street/	AM	21.0	C	21.5	C	+0.5
Veterans Boulevard	PM	32.2	C	35.0	C	+2.8
#11 Maple Street/	AM	23.3	C	23.5	C	+0.2
Veterans Boulevard	PM	32.8	C	33.7	C	+0.9
#12 Hansen Way/	AM	20.0	C	22.5	C	+2.5
Veterans Boulevard (U)	PM	27.4	D	31.0	D	+3.6
#13 Chestnut Street/	AM	15.7	B	15.9	B	+0.2
Veterans Boulevard	PM	17.8	B	19.2	B	+1.4
#14 Woodside Road/	AM	22.4	C	23.7	C	+1.3
Veterans Boulevard	PM	41.9	D	44.9	D	+3.0

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the 2000 Highway Capacity Manual, Transportation Research Board and include different delay ranges for each LOS.
2. Level of service.
3. "Change in Average Delay" is the change in the average delay between Background and Project Conditions.

(U) = Unsignalized intersection.

The results of the LOS calculations under Project Conditions indicate that all of the study intersections are expected to maintain acceptable operations (LOS D or better) during the AM and PM peak hours in the near term, which represents Phase I plus increased use of the hospital and emergency room according to the project construction schedule. Based on the LOS results and the significance criteria described above, Kaiser's proposed project is expected to have a less-than-significant impact to the study intersections.

TR-2. US 101 Freeway Segments and Ramp Operations in the Near Term – *The proposed project would not significantly affect US 101 freeway segments or ramp operations within the study area. (LTS)*

Freeway Segments. Study segments of US 101 were reviewed during the AM and PM peak hours to determine if a significant amount of project traffic would be added to these freeway segments. This analysis was conducted to identify potential near-term freeway impacts. The results of the AM peak hour freeway segment capacity analysis are summarized in Table 3.4-12. The results of the PM peak hour freeway segment analysis are summarized in Table 3.4-13.

The results of the freeway segment capacity analysis indicate that, during the AM peak hour, the volume of vehicles in the southbound US 101 mixed-flow lanes, Woodside Road to Marsh Road, exceeds the theoretical freeway segment capacity. All other study segments have V/C ratios of less than 1.0, where volume does not exceed capacity.

The proposed project is expected to add less than one percent of each freeway segment's capacity. Based on the significance criteria, the proposed project would result in a less-than-significant impact on the nearby freeway segments under Project Conditions.

As discussed under Background Conditions, the addition of auxiliary lanes would create a weaving section for vehicles entering and exiting US 101. Discussions with Caltrans operations staff indicated that weaving segments that are "sufficiently long," like those planned for US 101 in Redwood City, provide more than an adequate amount of space for drivers to find a gap and conduct the weaving maneuver. Thus, no weaving analysis is needed.

Freeway Ramps. To verify that the freeway ramps would have sufficient capacity to serve expected demand under Project Conditions, a volume-to-capacity analysis for each ramp was conducted. The results are presented in Table 3.4-14.

The results of the capacity analysis indicate that all of the study freeway ramps are expected to have a surplus of capacity (i.e., V/C ratios are less than 1.0) under Project Conditions.

Table 3.4-12
AM Peak Hour US 101 Freeway Segment Capacity Analysis – Project Conditions

Freeway Segment	Lane Type	Capacity[1]	Existing Volume[2]	Existing V/C[3]	Project Trips	Project Volume[2]	Project V/C[3]	Percent Impact[4]
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	8,640	0.94	47	8,687	0.94	0.51%
SB Woodside Rd to Marsh Rd	Mixed-Flow	6,900	7,720	1.12	38	7,758	1.12	0.55%
	HOV	1,800	1,136	0.63	6	1,142	0.63	0.33%
NB Marsh Rd to Woodside Rd	Mixed-Flow	6,900	5,187	0.75	55	5,242	0.76	0.79%
	HOV	1,800	889	0.49	9	898	0.50	0.50%
NB Whipple Ave to SR 92	Mixed-Flow	9,200	7,008	0.76	33	7,041	0.77	0.36%

Source: Fehr & Peers Associates, October 2002.

Notes:
1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained from existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

Table 3.4-13
PM Peak Hour US 101 Freeway Segment Capacity Analysis – Project Conditions

Freeway Segment	Lane Type	Capacity[1]	Existing Volume[2]	Existing V/C[3]	Project Trips	Project Volume	Project V/C[3]	Percent Impact[4]
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	7,772	0.84	32	7,804	0.85	0.35%
SB Woodside Rd to Marsh Rd	Mixed-Flow	6,900	6,388	0.93	45	6,433	0.93	0.65%
	HOV	1,800	939	0.52	7	946	0.53	0.39%
NB Marsh Rd to Woodside Rd	Mixed-Flow	6,900	4,001	0.58	36	4,037	0.59	0.52%
	HOV	1,800	639	0.36	7	646	0.36	0.38%
NB Whipple Ave to SR 92	Mixed-Flow	9,200	6,274	0.68	39	6,313	0.69	0.42%

Source: Fehr & Peers Associates, October 2002.

Notes:
1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained from existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

Table 3.4-14
US 101 Freeway Ramp Capacity Analysis – Project Conditions

		AM Peak Hour			PM Peak Hour		
Weaving Segment	**Capacity[1]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**
Southbound US 101 Off-Ramp/Veterans Boulevard	3,800	1,794	47	0.47	1,487	32	0.39
Northbound US 101 On-Ramp/Whipple Avenue	1,900	1,118	33	0.59	1,161	39	0.61
Southbound US 101 On-Ramp/Woodside Road	2,000	1,051	44	0.53	1,104	52	0.55
Northbound US 101 Off-Ramp/Woodside Road	1,900	1,348	64	0.71	1,308	43	0.69

Source: Fehr & Peers Associates, October 2002.

Notes:
1. Capacity based on information presented in Chapter 25 of the *2000 Highway Capacity Manual*.
2. Volumes obtained from existing count data provided by Caltrans plus traffic from the proposed project.
3. V/C = Volume-to-Capacity Ratio.

TR-3. Local Circulation - *Neither the proposed project or the Higher Occupancy Scenario would interfere with existing or proposed bicycle, pedestrian, or transit facilities. However, there are potentially significant impacts to bus-related traffic flow, bus and shuttle access, site access, and on-site circulation. (PS)*

The proposed pedestrian and transit circulation plan of the proposed project was reviewed to address transit, pedestrian, and bicycle access and circulation.

Buses. The addition of providers, staff, and patients would increase demand for SamTrans bus service. Assuming up to five percent of the new trips are made by bus transit, this could result in up to 16 new peak hour transit trips. This number is not expected to result in any capacity issues for existing service.

SamTrans Bus Route 270 provides direct access to the project site via existing stops on Veterans Boulevard. The stops are located mid-block between Walnut Street and Maple Street. Buses serving this stop may interrupt traffic flow on Veterans Boulevard if sufficient right-of-way is not available for buses to pull out of the travel way while passengers board and disembark. This would be a potentially significant impact. However, sufficient right-of-way is currently available.

The proposed project is expected to generate transit demand near the Veterans Boulevard/Walnut Street intersection, where the future hospital and administration buildings are to be located, and near the Veterans Boulevard/Maple Street intersection, where the MOBs are to be located. Without adequate outside lane width or a bus turn-out, a stopped bus could

interrupt traffic on Veterans Boulevard. In addition, the location of the eastbound bus stop encourages pedestrians attempting access the shopping center across Veterans Boulevard to jaywalk across this major roadway.

Shuttles. Buildout of the proposed project would affect the circulation of the two existing shuttles. Additionally, new shuttle routes, depending on where they stop, could affect through traffic on city streets.

A key element to increasing the use of Caltrain and bus transit service as an alternative to automobile trips by project employees is frequent and reliable shuttle service. Shuttle service should be provided at a minimum of 15-minute intervals during peak periods and when staff shifts change at campus facilities. Shuttle arrivals and departures should be coordinated with the train schedule. Although some patients may use Caltrain, staff is expected to represent the greatest proportion of riders. In addition, the Caltrain station is a major stop for SamTrans bus routes other than Route 270, and the shuttle would help make bus service a more viable alternative.

Pedestrian Facilities. As depicted on Figure 2-6 in Section 2, Project Description, the proposed project includes pedestrian facilities (i.e., sidewalks) along all portions of the project site that fronts city streets with the exception of Bradford Street and Walnut Street adjacent to Kaiser's Walnut building. The Master Plan shows additional pedestrian facilities within the campus. A pedestrian bridge over Walnut Street is proposed that would directly connect Parking Structure B to the Hospital. An existing pedestrian signal is located mid-block on Maple Street between Marshall Street and Veterans Boulevard and fosters access between portions of the campus located east and west of Maple Street. The Main Street/Bradford Street intersection is proposed to become signalized presumably to provide a controlled pedestrian crossing to the administration building on the north side of Main Street (the traffic signal is not warranted from an intersection operations perspective). Pedestrian crossings are provided at all signalized intersections and at the Walnut Street/Bradford Street unsignalized intersection. These facilities are expected to help minimize conflicts between pedestrians and vehicles and provide opportunities for campus employees and patients to walk to and between buildings.

Pedestrian access is an extremely important component of the transportation system for the project site. Its proximity to the downtown core and adjacent land uses, the links to Caltrain and bus service, and the need to minimize intra-campus vehicular travel are all key reasons to provide adequate pedestrian facilities around and within the site. If adequate pedestrian facilities are not provided, this may lead to a potentially significant impact on pedestrians.

Bicycle Facilities. There are no designated bicycle facilities in the vicinity of the project site. Bicycles share the roadway with vehicles. The project is not proposing to add any on-street facilities, and there are no planned/future bicycle facilities in the vicinity of the project. Therefore, the proposed project is not expected to prohibit future facilities and no significant impact would occur (based on the significance criteria identified above).

Site Access. The proposed vehicular circulation plan (Figure 2-5 in Section 2, Project Description) was reviewed to address vehicular access to the project site. Parking Structures A, B, and D would have direct access to Veterans Boulevard. Due to the center median on Veterans Boulevard, left turns out of these parking structures would be prohibited but right turns in and out would be permitted. An existing median break does permit westbound left-turn lane ingress to existing Parking Structure A. Vehicles exiting the Medical Center via driveways onto Veterans Boulevard and desiring to travel west on Veterans Boulevard would be required to turn right and make a U-turn at the next downstream intersection. Additional access to Parking Structure B would be provided via a full access driveway on Bradford Street. Parking Structures C and E would have access from Marshall Street only, with Parking Structure C sharing access with a service courtyard.

The number of driveways is expected to be sufficient to serve the expected demand of the proposed project. Access to the project site driveways is also expected to be adequate. Nevertheless, because design details are not yet available, if driveways are located too close to the adjacent public street intersection, the proposed project could create turning conflicts at the intersection. Similarly, driveways to parking structures without adequate warning systems and signage may not adequately signal the presence of pedestrians to vehicle drivers and the presence of vehicles to pedestrians.

Designated drop-off areas would be provided on either side of Main Street (providing access to the administrative offices and Cancer Care Center), on the east side of Walnut Street (providing access to the Hospital), and on the east and west sides of Maple Street (providing access to the MOBs). Because design details are not yet available, it is possible for the drop-off areas to interfere with through traffic on the adjacent street and for drop-offs from the passenger side of vehicles to occur next to the curb.

On-Site Circulation. As noted above, a detailed site plan is currently unavailable to assess the roadway geometrics and parking structure circulation design. Thus, this assessment is based on City and industry standards. It is recommended that all two-way circulation aisles maintain a minimum width of 24 feet. All parking spaces should be designed according to City standards. Dead-end parking aisles should be avoided, but if needed, an adequate turn-around area should be provided. Turning templates should be applied to the final site plan to ensure that all vehicles circulating within the site can negotiate all required turning movements. The Redwood City Fire Department should review the final site plan to ensure that adequate emergency access would be provided.

On-site pedestrian circulation is shown in Figure 2-6 via public sidewalks along the project site frontage and on sidewalks through the central plaza surrounded by the Hospital and MOB 2/Parking Structure C and MOB 3/Parking Structure D. There does not appear to be a pedestrian connection between the central plaza and Marshall Street via Marshall Court (the service courtyard entrance). This could encourage pedestrians to circulate on Marshall Court, competing with motorized vehicles, a potentially significant impact.

MITIGATION MEASURES. The following mitigation measures would reduce the potentially significant bus-related traffic flow, bus and shuttle access, site access, and on-site circulation impacts to a less-than-significant level. (LTS)

TR-3.1 *Design Bus Access to Minimize Conflicts Among Vehicles and Pedestrians.* To maintain traffic flow along Veterans Boulevard and minimize conflicts between buses and other vehicles:

a. The existing 20-foot width of the southbound curb lane on Veterans Boulevard adjacent to the project site shall be maintained. This lane width allows a bus to exit the flow of traffic while making a stop.

b. Red curb shall be located for 20 feet on either side of the stop if on-street parking is permitted.

c. If the lane width is narrowed at all, a separate bus turnout shall be provided.

TR-3.2 *Design Pedestrian Access to Minimize Conflicts with Vehicles.* To maintain pedestrian and traffic flow and minimize conflicts between pedestrians and vehicles:

a. All public and on-site sidewalks shall provide additional width where possible.

b. Sidewalks shall maintain a minimum of five feet in width in low traffic areas, and 10 or more feet in width where high pedestrian volumes are anticipated (e.g. near bus stops, between parking structures and the Hospital or MOBs) and where street furniture or street luminaries may reduce the effective walking area, or as otherwise stipulated in the Precise Plan.

c. The proposed pedestrian bridge, linking Parking Structure B with the Hospital, shall be designed so that it does not interfere with visibility for vehicles on Walnut Street. To be effective in reducing the number of pedestrians crossing midblock at this location, the lower level of the parking structure shall be designed to preclude pedestrian access on Walnut Street. The vehicle entrances are currently proposed for Veterans Boulevard and Bradford Street, which will discourage at-grade pedestrian crossings.

d. The existing pedestrian signal located on Maple Street will provide access between the portions of the campus on either side of Maple Street. The pedestrian signal could adversely affect operations at the Veterans Boulevard/Maple Street intersection due to its proximity to that intersection. A combination of pedestrian enhancements could be installed at this location, including bulbouts (narrowing the amount of roadway pedestrians would have to cross), up-lit crosswalks, or pedestrian crossing warning systems.

e. Adequate pedestrian access shall be provided throughout the Medical Center, including between the central plaza and Marshall Street.

TR-3.3 *Design Site Access and Circulation to Minimize Conflicts with Vehicles.* To maintain traffic flow and minimize conflicts between pedestrians and vehicles, the project sponsor shall comply with the following standards, unless they conflict with the Precise Plan in which case the Precise Plan would govern:

a. All driveways shall be located at a minimum of 75 feet from the adjacent public street intersection (measured from the curb return to the first driveway cut).

b. Driveways to parking structures shall be installed with warning systems and signage to alert motorists and pedestrians of each other.

c. Drop off areas shall include one lane for drop-offs with a by-pass lane for vehicles exiting the drop-off lane.

d. Drop off areas shall be designed so drop-offs occur from the passenger side of vehicles next to the curb.

e. Parking aisles, turning templates, and circulation aisles shall be designed to City standards or as stipulated in the Precise Plan.

TR-3.4 *Reduce Project-related Motor Vehicle Emissions through Alternate Transportation Facilities.* Incorporation of the following measures into the proposed project and/or into the Transportation Demand Management (TDM) program required by C/CAG would ensure further reduction of the number of motor vehicle trips or the length of the trips. This list is not intended to be exhaustive, and other equivalent measures may be introduced by the City, C/CAG, or the project sponsor. All TDM measures are subject to review and approval by Redwood City.

a. Kaiser shall subsidize transit tickets for employees wishing to use Caltrain or SamTrans buses as a commute alternative. This will encourage the use of the existing transit facilities as a commute alternative.

b. Kaiser shall work with SamTrans to evaluate relocation of the existing mid-block Veterans Boulevard stop and the addition of a second stop on Veterans Boulevard. The project sponsor should provide a turnout (as required), a transit shelter, and other amenities at all bus stops located along the project frontage to encourage the use of this mode.

c. Caltrain shuttle stop locations shall be designated onsite or in turnouts along the project site frontage to minimize the impact to through traffic on city streets. Additionally, the shuttle stops shall be designed to avoid conflict with on or off site vehicular, pedestrian, or bicycle circulation.

d. Kaiser shall increase the frequency and number of shuttles to provide convenience access to the Caltrain station and downtown Redwood City.

e. To encourage bicycle travel, the project shall include secure and covered bicycle parking spaces on site for staff. Additional bicycle racks shall be installed throughout the campus to allow patients and other visitors to lock their bicycle. Enhanced bicycle facilities will allow Caltrain riders an alternative to using the shuttle and will permit bicycle usage for other activities such as travel to downtown lunch and shopping destinations, as well as exercise opportunities.

f. Kaiser shall provide on-site amenities to encourage bicycles and walking as a commute alternative. These amenities shall include showers and changing rooms.

g. The City's draft *Downtown Area Plan* and draft *Kaiser Master Plan Urban Design Guidelines* both call for enhanced pedestrian connections to and through the Downtown District. The City shall review Kaiser's development applications to ensure that the campus is designed and built in compliance with these City policies. In developing its plans, the project sponsor shall design sidewalks and pedestrian routes in a manner that encourages walking to, from, and around the Medical Center.

TR-4. Parking Supply and Demand - *The proposed project would provide sufficient onsite parking spaces to meet the projected parking demand. (LTS)*

Parking demand at the Medical Center consists of spaces required to serve hospital, emergency room, medical office, and administrative office parking needs. Each of these components is described below.

Hospital Parking. ITE *Parking Generation* (6^{TH} Edition) presents parking generation rates for hospitals based on occupied parking spaces per hospital bed. Similar to the trip generation rates developed for the hospital to determine trips per *occupied bed*, the ITE parking generation rate was divided by 0.75 (information provided by James Brinkley Company indicated that most hospitals are approximately 75 percent occupied) to develop a parking rate per occupied bed.

The ITE rate is 1.79 occupied parking spaces per bed. The adjusted rate is 2.39 occupied parking spaces per *occupied bed*. Therefore, the increase in 40 occupied beds associated with the proposed project is expected to generate demand for 96 additional spaces over the current hospital demand. Standard transportation engineering practice recommends that the parking demand be multiplied by 1.10 to determine the number of parking spaces that should be provided (to account for circulation). Therefore, a minimum of 106 parking spaces would be required for the increased hospital use.

Emergency Room Parking. The trip generation estimates for the increase in emergency room parking assumed that a total of five patients would be admitted and treated during the peak hour. Assuming that each patient visit lasts four hours, it was conservatively estimated that the parking demand generated by the increased emergency room use would be approximately 40 parking spaces. Using the circulation factor of 1.10, a minimum of 44 parking spaces would be required for the increased emergency room use.

Medical Office Parking. Parking occupancy surveys were conducted at the existing Kaiser clinic in the City of Roseville located at Riverside Boulevard and Cirby Road near I-80 (the same facility that was surveyed to estimate trip generation). The results of the survey indicate that the facility generates a total parking demand of 629 spaces. Based on 72 providers at the facility, the data resulted in a parking generation rate of 8.74 parking spaces per provider.

During Phase I of the proposed project, Kaiser projects that the number of on-campus providers will increase by 23. Using the surveyed parking generation rate, the MOBs are expected to generate an additional parking demand of 201 parking spaces. Using the circulation factor of 1.10, a minimum of 221 parking spaces would be required for the MOBs.

Administrative Office Parking. The 34,000 GSF of administrative office space that is currently located in off-campus facilities is expected to transfer to the Redwood City campus. The administrative office space is expected to have parking characteristics that are similar to regular office space. The City of Redwood City parking code was reviewed to determine the number of parking spaces that should be provided. The code, which already includes a circulation factor, requires one parking space per 300 s.f. of office space. Therefore, the relocation of administrative office staff would require at least 114 parking spaces.

Summary of Parking. The proposed project requires at least 485 new parking spaces to accommodate the increased uses on the campus and avoid causing a parking impact or deficiency. The proposed project includes a total of 3,006 parking spaces in structures and lots, which represents an increase of 1,633 spaces, or 119 percent more than the existing supply of 1,373 spaces. Thus, the increase in demand of 485 spaces related to the proposed project would be accommodated by the proposed 1,633 new spaces and no parking deficiencies are anticipated.

TR-5. Congestion Management Agency Requirements - *Both the proposed project and the Higher Occupancy Scenario would generate more than 100 new peak hour trips and would be required to prepare a Transportation Demand Management Plan to satisfy C/CAG requirements. (LTS)*

Kaiser's proposed project is expected to generate 402 new AM peak-hour trips and 354 new PM peak hour trips. Because the proposed project is expected to generate more than 100 net new peak-hour trips and is subject to CEQA review, the proposed project must meet the requirements presented in the C/CAG *Guidelines for the Implementation of the Land Use Component of the 1999 Congestion Management Program*.

Based on the C/CAG requirements, the project sponsor must implement and maintain a transportation demand management (TDM) plan that has the capacity to fully reduce all 402 net new peak-hour trips on the CMP roadway network. The TDM plan, to be developed by the project sponsor, must be approved by both the City of Redwood City and C/CAG prior to certification of this EIR. Kaiser's proposed TDM plan is presented in Appendix E.

TR-6. Construction Period Trips and Parking - *Construction-related trips from construction deliveries and workers would add to congestion at study area intersections but because the effects would be temporary, they are considered to be less than significant. The parking demand associated with construction activities would not exceed on-street and off-street parking supply (Refer to Table 2-10). (LTS)*

Development of the proposed project would require demolition of existing structures, transport of waste, earth, materials, and construction of new buildings. All of these activities would generate trips by construction vehicles and workers. The vehicles with the greatest impact on peak period traffic operations are trucks because of their slow acceleration, long deceleration, and wide turning radii. These characteristics can reduce the capacity of the adjacent streets if they constitute a significant proportion of traffic. It should be noted that Kaiser's current construction plans would not involve any street closures. The project description (in Section 2.7) notes that Kaiser will be required to prepare a construction and demolition plan that will address potential construction-period impacts including traffic and parking issues.

Two components of project construction would add traffic to the surrounding roadway system. The first component is traffic associated with deliveries to the project site. Peak construction deliveries are expected to occur in October 2013 when MOB 2 and the Administration Building are both under construction. The second component is trips generated by on-site construction workers. The greatest number of on-site construction workers is expected to occur between August 2008 and January 2009 when the replacement Hospital and Parking Structure B are both expected to be under construction. These components are described in greater detail below.

Construction Deliveries. Information provided by the project sponsor indicates that when MOB 2 and the Administration Building are under construction (October 2013), a total of 80 deliveries per day are expected. Assuming that ten percent of these deliveries occur during the peak hours, it is estimated that eight deliveries would occur during each peak hour. Assuming that all deliveries constitute two trips (one inbound trip and one outbound trip) and that each delivery truck has a passenger car equivalency of 2.0 cars, it was estimated that trips generated by delivery vehicles would be equivalent to 32 peak hour vehicle trips (16 inbound trips and 16 outbound trips). This volume would not significantly affect any of the study intersections during the peak periods.

Construction Workers. Based on information provided by the project sponsor, the greatest number of on-site construction workers would occur when the replacement Hospital and Parking Structure B are both under construction (August 2008 thru January 2009). During this

time, the project sponsor projects that 350 construction workers would be on-site. Although construction workers typically generate traffic outside the peak hours, for purposes of this analysis, it was conservatively assumed that half (or 175) of the construction workers would be arriving during the AM peak hour and departing during the PM peak hour.

Intersection Level of Service. An LOS analysis was conducted for year 2008 conditions (when the hospital and Parking Structure B are under construction) and when construction traffic is expected to be at its highest level. This analysis was conducted by: 1) applying a growth factor of one percent per year to existing volumes, 2) adding trips generated by approved and pending projects in the area, 3) adding trips associated with Phase I of the proposed project, and 4) adding traffic generated by the construction workers. The results of the LOS analysis under year 2008 conditions indicated that all but one of the study intersections are expected to operate acceptably (LOS D or better) during the AM and PM peak hours. The Veterans Boulevard/Hansen Way intersection is expected to operate at an unacceptable level (LOS E during the PM peak hour only) under this scenario. However, the minor street approach to this intersection is not expected to meet the minimum volume requirement for traffic signal installation. Therefore, the addition of construction worker traffic is *not* expected to significantly affect peak period intersection operations in 2008.

In year 2020 (the year which corresponds to Cumulative Conditions), MOB 4 and Parking Structure E are expected to be under construction. Based on information provided by the project sponsor, approximately 150 construction workers are expected to be on site at this time. Similar to the Year 2008 analysis described above, 50 percent of the traffic generated by the 150 construction workers (75 inbound AM peak hour trips and 75 outbound PM peak hour trips) was added to the trips generated by the proposed project under Cumulative Conditions and an LOS analysis was conducted. The results of the LOS analysis indicate that, with construction traffic added to the Cumulative with Project Condition volumes, the Whipple Avenue/Veterans Boulevard intersection is expected to operate at LOS F during the AM and PM peak hours. The Hansen Way/Veterans Boulevard intersection is expected to operate at LOS E during the AM peak hour and LOS F during the PM peak hour. The Woodside Road/Veterans Boulevard intersection is expected to operate at an acceptable LOS D during the AM peak hour and an unacceptable LOS F during the PM peak hour. All other study intersections are expected to operate acceptably under this scenario.

The addition of construction traffic (in addition to project traffic) under Cumulative Conditions is expected to exacerbate unacceptable operations at the Whipple Avenue/Veterans Boulevard intersection during the AM and PM peak hours. Construction traffic accounts for 1.0 second and 0.2 seconds of added delay during the AM and PM peak hours, respectively. Without this construction-related traffic, the proposed project would not result in a significant cumulative impact at this location. Since the presence of construction-related traffic is a temporary condition, the construction impact are expected to be less-than-significant at this location.

The Hansen Way/Veterans Boulevard intersection is expected to operate unacceptably during the PM peak hour under Cumulative with Project Conditions. The addition of construction

traffic is expected to exacerbate this condition. However, the minor street approach would not meet the peak hour warrants for signal installation. Therefore, the addition of construction traffic is expected to have a less-than-significant impact at the intersection under year 2020 conditions.

The Woodside Road/Veterans Boulevard intersection would operate at an acceptable LOS D during the AM peak hour and an unacceptable LOS F during the PM peak hour under Cumulative with Project Conditions. The addition of construction traffic is expected to further exacerbate operations at this intersection during the PM peak hour. Under Cumulative with Project Conditions, intersection modifications were identified for this intersection to operate at an acceptable level. Although the identified intersection modifications would provide acceptable operations at the intersection even with added construction traffic, the modifications are considered to be infeasible due to right-of-way constraints. The addition of project traffic is expected to result in a significant cumulative intersection impact; however, the presence of construction-related traffic is a temporary condition. Therefore, the added impact from construction traffic is considered to be less-than-significant at this location.

Parking. As shown in Table 2-10 in Section 2, Project Description, the demand for parking during any given phase would be satisfied by spaces available onsite and on the streets surrounding the Kaiser campus. Kaiser has projected the parking demand from the medical uses at each phase, as well as the construction activities. Sufficient spaces exist on the campus from building removal and installation of temporary lots without having to rely on on-street spaces during Phases IIB, IID, III, and IV. During the other construction phases (I, IIA, IIC, and V), parking demand at the Kaiser Medical Center would need to be satisfied by using some of the 280 parking spaces on the streets surrounding and traversing the campus.

Cumulative (Year 2020) Conditions Analysis

A Cumulative Conditions analysis was performed to identify potential project impacts under conditions expected to occur in year 2020. First, Cumulative No Project Conditions are presented. Next, the impact of adding traffic associated with the proposed project to 2020 volumes, which represents Cumulative with Project Conditions, is discussed. The Project Conditions reflect Kaiser's projected increase of 23 providers onsite at buildout.

In addition to cumulative impacts associated with the proposed project, a Higher Occupancy Scenario analysis was conducted under Cumulative Conditions. The Higher Occupancy Scenario analysis was conducted to estimate impacts if the campus were occupied at a higher density (i.e., more providers per square foot) than Kaiser has projected. The Higher Occupancy Scenario density projections were developed by James Brinkley Company (the City's health care consultant) and assume an increase of 105 providers onsite at buildout.

Cumulative (Year 2020) No Project Conditions. The same methodology used to derive baseline conditions for the near-term scenario was applied to develop future Cumulative Conditions.

Roadway Improvements. Based on discussions with City staff, the following roadway improvements were assumed to be implemented under Cumulative Conditions:

- *Veterans Boulevard, Chestnut Street to Woodside Road*. Southbound Veterans Boulevard is expected to be widened to two lanes. This improvement is part of the Redwood City Traffic Impact Fee Mitigation Program. Discussions with City staff have indicated that this project is approximately ten to 15 years from implementation. This improvement is expected to increase queuing capacity at the Veterans Boulevard/Woodside Road intersection.

- *Veterans Boulevard/Middlefield Road Intersection*. This intersection is currently unsignalized. Signalization of the intersection was identified as mitigation for the Downtown Cinema Mixed-Use project.

Cumulative No Project Intersection Volume Estimates. Cumulative No Project Conditions are defined as year 2020 conditions without the proposed project. Volumes under this scenario were developed following a three-step process:

1. Year 2020 No Project forecasts were obtained from the C/CAG travel demand model and compared to the base year volumes. A per annum growth factor was developed to estimate the amount of regional traffic growth expected in the area.

2. A growth factor of one percent per year, determined in step 1, was applied to existing volumes that were obtained from the intersection counts.

3. Traffic associated with approved and pending projects in the area were assigned to the roadway network. These trips were then added to the factored volumes at the study intersections to obtain turning movement volumes under Cumulative Conditions.

The Cumulative No Project Conditions turning movement volumes are presented on Figure 3.4-9.

Cumulative No Project Intersection Level of Service. LOS were calculated for the study intersections using cumulative traffic volumes. Table 3.4-15 presents the LOS results under Cumulative No Project Conditions. The results of the LOS analysis under Cumulative No Project Conditions indicate that, during the AM and PM peak hours, operations at the Veterans Boulevard/Whipple Avenue intersection are expected to degrade to an unacceptable level (LOS F). Operations at the Veterans Boulevard/Hansen Way intersection are expected to degrade to an unacceptable level (LOS E) during the AM peak hour and LOS F during the PM peak hour. The Veterans Boulevard/Woodside Road intersection is expected to maintain acceptable operations during the AM peak hour but is expected to degrade to an unacceptable LOS F during the PM peak hour. All other study intersections are expected to maintain acceptable operations (LOS D or better) during the AM and PM peak hours.

Slipsheet for Figure 3.4-9 Cumulative No Project Condition Volumes

Table 3.4-15
Intersection Level of Service Summary – Cumulative No Project Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Delay[1]	LOS[2]	Delay[1]	LOS[2]
#1 Walnut Street/Marshall Street	Stop-Control	12.4	B	11.6	B
#2 Marshall Court/Marshall Street	Stop-Control	10.5	B	11.4	B
#3 Maple Street/Marshall Street	Stop-Control	11.7	B	21.7	C
#4 Chestnut Street/Marshall Street	Stop-Control	13.4	B	15.7	C
#5 Main Street/Bradford Street	Stop-Control	14.7	B	20.8	C
#6 Walnut Street/Bradford Street	Stop-Control	7.9	A	8.6	A
#7 Whipple Avenue/Veterans Boulevard	Traffic Signal	82.1	F	84.6	F
#8 Jefferson Avenue/Veterans Boulevard	Traffic Signal	20.5	C	32.7	C
#9 Main Street/Veterans Boulevard	Traffic Signal	20.8	C	30.1	C
#10 Walnut Street/Veterans Boulevard	Traffic Signal	20.4	C	32.5	C
#11 Maple Street/Veterans Boulevard	Traffic Signal	27.9	C	37.5	D
#12 Hansen Way/Veterans Boulevard	Stop-Control	35.2	E	104.1	F
#13 Chestnut Street/Veterans Boulevard	Traffic Signal	16.8	B	19.0	B
#14 Woodside Road/Veterans Boulevard	Traffic Signal	47.2	D	114.2	F

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average total control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the *2000 Highway Capacity Manual,* Transportation Research Board.
2. Level of Service.

Cumulative No Project Freeway Segment Capacity Analysis. Study segments of US 101 were reviewed during the AM and PM peak hours to evaluate expected freeway operations under Cumulative No Project Conditions. An annual growth rate of 0.5 percent per year was estimated based on information from the C/CAG travel demand forecasting model and regional growth trends. This growth rate was applied to the existing volumes and the freeway segment capacity analysis was conducted under Cumulative No Project Conditions. The results of the freeway segment capacity analysis are summarized in Table 3.4-16.

The results of the freeway segment capacity analysis indicate that the volume of vehicles in the southbound US 101 mixed-flow lanes exceeds the segment's capacity from SR 92 to Whipple Avenue and from Woodside Road to Marsh Road during the AM peak hour. During the PM peak hour, the demand in the southbound US 101 mixed-flow lanes from Woodside Road to Marsh Road is expected to exceed capacity. All other study segments are expected to have V/C ratios less than 1.0.

Table 3.4-16
US 101 Freeway Segment Capacity Analysis – Cumulative No Project Conditions

			AM Peak Hour		PM Peak Hour	
Freeway Segment	**Lane Type**	**Capacity[1]**	**Volume[2]**	**V/C[3]**	**Volume[2]**	**V/C[3]**
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	9,452	1.03	8,502	0.92
SB Woodside Rd to Marsh Rd	Mixed-Flow	6,900	8,445	1.22	6,988	1.01
	HOV	1,800	1,242	0.69	1,027	0.57
NB Marsh Rd to Woodside Rd	Mixed-Flow	6,900	5,674	0.82	4,377	0.63
	HOV	1,800	973	0.54	699	0.39
NB Whipple Ave to SR 92	Mixed-Flow	9,200	7,666	0.83	6,863	0.75

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis. See text of description on how traffic in the auxiliary lanes was addressed in the analysis.
2. Volumes obtained by applying a 0.5-percent per year growth factor to the existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.

Cumulative No Project Freeway Ramp Capacity Analysis. Operation of the study freeway ramps was reviewed by conducting a volume-to-capacity analysis under Cumulative No Project Conditions. The purpose of the analysis was to verify that the freeway ramps would have sufficient capacity to serve demand under Cumulative No Project Conditions.

A growth rate of 0.5 percent per year was applied to the existing volumes (obtained from Caltrans counts) and traffic from approved and pending projects in the area was then added together to estimate volumes under Cumulative No Project Conditions. The results of the volume-to-capacity analysis are presented in Table 3.4-17.

The results of the analysis indicate that all of the study ramps are expected to have a V/C ratio less than 1.0 during the AM and PM peak hours under Cumulative No Project Conditions (i.e., the ramps are expected to have sufficient capacity to serve demand). The northbound off-ramp from US 101 to Woodside Road is expected to approach capacity during the PM peak hour, but all other locations are projected to have a V/C ratio of 0.85 or less.

Cumulative (Year 2020) With Proposed Project Conditions. Project-related conditions (23 additional providers, plus increased hospital bed occupancy and emergency room use) in combination with cumulative development result in the following impacts.

Table 3.4-17
US 101 Freeway Ramp Capacity Analysis – Cumulative No Project Conditions

		AM Peak Hour		PM Peak Hour	
Weaving Segment	**Capacity[1]**	**Volume[2]**	**V/C[3]**	**Volume[2]**	**V/C[3]**
Southbound US 101 Off-Ramp/Veterans Boulevard	3,800	2,382	0.63	2,029	0.53
Northbound US 101 On-Ramp/Whipple Avenue	1,900	1,512	0.80	1,122	0.59
Southbound US 101 On-Ramp/Woodside Road	2,000	1,492	0.75	1,646	0.82
Northbound US 101 Off-Ramp/Woodside Road	1,900	1,617	0.85	1,838	0.97

Source: Fehr & Peers Associates, October 2002.

Notes:
1. Capacity based on information presented in Chapter 25 of the *2000 Highway Capacity Manual*.
2. Volumes obtained by applying a 0.5-percent growth factor per year to existing count data provided by Caltrans plus traffic from approved and pending projects.
3. V/C = Volume-to-Capacity Ratio.

TR-7. Intersection Operations under Cumulative with Project Conditions - *The Cumulative with Project Conditions would result in several intersections (Whipple Avenue/Veterans Boulevard, Hansen Way/Veterans Boulevard, and Woodside Road/Veterans Boulevard) operating at unacceptable levels during various peak periods. However, the proposed project would contribute substantially only to the unacceptable levels of service at the Woodside Road/Veterans Boulevard intersection. (S)*

To estimate volumes under Cumulative with Project Conditions, traffic from the proposed project was added to the Cumulative No Project Conditions volumes. The "with Project" volumes are presented on Figure 3.4-10. LOS was calculated for the study intersections using cumulative traffic volumes plus traffic from Kaiser's proposed project. Table 3.4-18 presents the LOS results under Cumulative with Proposed Project Conditions.

Whipple Avenue/Veterans Boulevard. The results of the intersection analysis indicate that the Whipple Avenue/Veterans Boulevard intersection is expected to operate at an unacceptable LOS F during the AM and PM peak hours. The addition of project traffic is expected to increase the average delay at the intersection by 4.9 and 1.5 seconds during the AM and PM peak hours, respectively. Therefore, the proposed project in combination with regional growth and traffic from pending projects in the area, is expected to have a less-than-significant cumulative project impact on the Whipple Avenue/Veterans Boulevard intersection.

Figure 3.4-10: Cumulative With Project Conditions Volumes

Table 3.4-18
Intersection Level of Service Summary –
Cumulative No Project and Cumulative With Proposed Project Conditions

Intersection	Peak Hour	No Project Conditions		With Proposed Project Conditions		Change in Average Delay[3]
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	
#1 Walnut Street/ Marshall Street	AM	12.4	B	13.0	B	+0.6
	PM	11.6	B	12.2	B	+0.6
#2 Marshall Court/ Marshall Street	AM	10.5	B	11.0	B	+0.5
	PM	11.4	B	12.1	B	+0.7
#3 Maple Street/ Marshall Street	AM	11.7	B	12.7	B	+1.0
	PM	21.7	C	26.0	D	+4.3
#4 Chestnut Street/ Marshall Street	AM	13.4	B	14.1	B	+0.7
	PM	15.7	C	16.7	C	+1.0
#5 Main Street/ Bradford Street	AM	14.7	B	15.5	C	+0.8
	PM	20.8	C	22.8	C	+2.0
#6 Walnut Street/ Bradford Street	AM	7.9	A	8.1	A	+0.2
	PM	8.6	A	8.8	A	+0.2
#7 Whipple Avenue/ Veterans Boulevard	AM	82.1	F	87.0	F	+4.9
	PM	84.6	F	86.1	F	+1.5
#8 Jefferson Avenue/ Veterans Boulevard	AM	20.5	C	21.1	C	+0.6
	PM	32.7	C	33.0	C	+0.3
#9 Main Street/ Veterans Boulevard	AM	20.8	C	21.4	C	+0.6
	PM	30.1	C	30.4	C	+0.3
#10 Walnut Street/ Veterans Boulevard	AM	20.4	C	22.8	C	+2.4
	PM	32.5	C	36.6	D	+4.1
#11 Maple Street/ Veterans Boulevard	AM	27.9	C	28.5	C	+0.6
	PM	37.5	D	38.3	D	+0.8
#12 Hansen Way/ Veterans Boulevard	AM	35.2	E	41.0	E	+4.8
	PM	104.1	F	132.2	F	+28.1
#13 Chestnut Street/ Veterans Boulevard	AM	16.8	B	21.2	C	+4.4
	PM	19.0	B	20.0	B	+1.0
#14 Woodside Road/ Veterans Boulevard	AM	47.2	D	54.0	D	+6.8
	PM	114.2	F	**128.8**	**F**	**+14.6**

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average total control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the *2000 Highway Capacity Manual,* Transportation Research Board.
2. Level of service.
3. "Change in Average Delay" is the change in the average delay between No Project and With Project Conditions.

Significant cumulative project impacts indicated in **bold** type.

The addition of a dedicated northbound right-turn lane was identified for this intersection in the Redwood City Traffic Impact Mitigation Fee Study. However, the LOS analysis indicated that this improvement would not allow the intersection to operate acceptably under Cumulative with Proposed Project Conditions, although it would improve operations to LOS E during the AM and PM peak hours and mitigate the impact to a less-than-significant level. For the intersection to operate acceptably (LOS D or better) during the AM and PM peak hours under Cumulative with Proposed Project Conditions, the following improvements would be needed:

- Reconfigure the northbound approach to include one left-turn lane, three through lanes, and one right-turn lane.
- Change northbound permitted left-turn phase to a protected phase.
- Provide eastbound right-turn with a green arrow during northbound left-turn phase, creating an "overlap" phase for the eastbound right-turns. Northbound u-turns would be prohibited.
- Add a second southbound left-turn lane.

With these improvements, the intersection is expected to operate at LOS D during the AM and PM peak hours. It should be noted that improvements to the northbound approach would likely be infeasible due to right-of-way constraints. Additionally, improvements to the southbound approach may require modifications to the Whipple Avenue overpass and would likely require coordination with Caltrans. Since the project does not have a significant impact at this location, no mitigation, beyond payment of the transportation fee, is required.

Hansen Way/Veterans Boulevard. This intersection is expected to operate at an unacceptable LOS E during the AM peak hour and LOS F during the PM peak hour under Cumulative with Proposed Project Conditions. The proposed project is expected to increase the average delay at the unsignalized intersection by more than 5.0 seconds. However, volumes on the minor street are **not** expected to meet the minimum volume requirement of 100 vehicles to satisfy the Caltrans Peak Hour Volume Warrant (although the minor street is expected to have 94 peak-hour vehicles). Since both conditions for a significant impact are not satisfied, the proposed project in combination with regional growth and traffic from pending projects would have a less-than-significant cumulative project impact.

It is recommended that the intersection be monitored in a similar manner as other unsignalized intersections in Redwood City to determine if signalization would be warranted in the future. If the intersection were to become signalized under Cumulative with Proposed Project Conditions, the intersection is expected to operate at LOS A during the AM and PM peak hours.

Woodside Road/Veterans Boulevard. This intersection is expected to maintain acceptable operations during the AM peak hour but is expected to operate at LOS F, an unacceptable level, during the PM peak hour. The proposed project, under Cumulative Conditions, is

expected to increase the average delay by more than 5.0 seconds. Therefore, the proposed project in combination with regional growth and traffic from pending projects, is expected to have a significant cumulative project impact on the Woodside Road/Veterans Boulevard intersection.

MITIGATION MEASURE. The following mitigation measures would reduce Cumulative with Proposed Project Conditions to a less-than-significant effect. However, the feasibility of implementing these measures at the intersection of Woodside Road/Veterans Boulevard is unlikely and therefore the impact is expected to remain significant and unavoidable. Approval of the proposed project would require a Statement of Overriding Considerations by the Redwood City Council. (SU)

TR-7.1 *Contribute to Woodside Road/Veterans Boulevard Intersection Improvements*. To mitigate cumulative project impacts, the eastbound approach on Veterans Boulevard would need to be widened to accommodate an additional through lane (with an associated receiving lane on the on-ramp to US 101). Additionally, the southbound right-turn movement would need to be controlled by a separate phase (i.e., an arrow) that would be green while the eastbound left-turn phase occurs (this is known as an "overlap" right-turn phase and would require prohibition of eastbound U-turns). With this improvement, the intersection is expected to operate at LOS C during the AM peak hour and LOS D during the PM peak hour.

It should be noted that a second receiving lane would have to be added on the US 101 on-ramp and the ramp would have to be widened to accommodate merging with the ramp connection from eastbound Woodside Road. If the ramp is not sufficiently widened, merging congestion could degrade ramp operations making this mitigation undesirable. Additionally, Caltrans approval would be required. City staff has indicated that widening of the freeway ramp is most likely infeasible.

TR-8. US 101 Freeway Segments under Cumulative with Proposed Project Conditions - *Under Cumulative With Project Conditions, certain freeway segments would be over capacity, but the proposed project would result in a minimal contribution and thus have a less-than-significant impact on the nearby freeway segments. (LTS)*

Study segments of US 101 were reviewed during the AM and PM peak hours to determine if a significant amount of project traffic would be added to these freeway segments under Cumulative Conditions. The results of the AM peak hour freeway segment capacity analysis are summarized in Table 3.4-19. The results of the PM peak hour freeway segment analysis are summarized in Table 3.4-20.

Table 3.4-19
AM Peak Hour US 101 Freeway Segment Capacity Analysis –
Cumulative With Proposed Project Conditions

Freeway Segment	Lane Type	Capacity[1]	Cumulative No Project Conditions		Project Trips	Cumulative With Proposed Project Conditions		Percent Impact[4]
			Volume[2]	V/C[3]		Volume	V/C[3]	
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	9,452	1.03	47	9,499	1.03	0.51%
SB Woodside Rd	Mixed-Flow	6,900	8,445	1.22	38	8,483	1.23	0.55%
to Marsh Rd	HOV	1,800	1,242	0.69	6	1,248	0.69	0.33%
NB Marsh Rd to	Mixed-Flow	6,900	5,674	0.82	55	5,729	0.83	0.80%
Woodside Rd	HOV	1,800	973	0.54	9	982	0.55	0.50%
NB Whipple Ave to SR 92	Mixed-Flow	9,200	7,666	0.83	33	7,699	0.84	0.36%

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained by applying a growth factor of 0.5 percent per year to existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

Table 3.4-20
PM Peak Hour US 101 Freeway Segment Capacity Analysis –
Cumulative With Proposed Project Conditions

Freeway Segment	Lane Type	Capacity[1]	Cumulative No Project Conditions		Project Trips	Cumulative With Proposed Project Conditions		Percent Impact[4]
			Volume[2]	V/C[3]		Volume	V/C[3]	
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	8,502	0.92	32	8,534	0.93	0.35%
SB Woodside Rd	Mixed-Flow	6,900	6,988	1.01	45	7,033	1.02	0.65%
to Marsh Rd	HOV	1,800	1,027	0.57	7	1,034	0.57	0.38%
NB Marsh Rd	Mixed-Flow	6,900	4,377	0.63	36	4,413	0.64	0.64%
to Woodside Rd	HOV	1,800	699	0.39	7	706	0.39	0.39%
NB Whipple Ave to SR 92	Mixed-Flow	9,200	6,863	0.75	39	6,902	0.75	0.42%

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained by applying a growth factor of 0.5-percent per year to existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

During the AM peak hour, the estimated volume of vehicles in the southbound US 101 mixed-flow lanes from SR 92 to Whipple Avenue and from Woodside Road to Marsh Road is expected to exceed the freeway segment capacity with or without the proposed project. All other study segments are expected to have V/C ratios less than 1.0. During the PM peak hour, the capacity of the southbound US 101 mixed-flow lanes is expected to be exceeded from Woodside Road to Marsh Road. All other study segments are expected to have V/C ratios less than 1.0.

The proposed project is expected to add less than one-percent of each freeway segment's capacity to each segment during the AM and PM peak hours. Therefore, the proposed project would result in a less-than-significant impact on the nearby freeway segments.

TR-9. US 101 Freeway Ramp Operations under Cumulative with Proposed Project Conditions - *Under Cumulative with Project Conditions, the study freeway ramps would have sufficient capacity to serve demand. (LTS)*

Project trips onto nearby freeway ramps were added to volumes that were estimated under Cumulative No Project Conditions. The results of the volume-to-capacity analysis are presented in Table 3.4-21. The results of the analysis indicate that all of the study ramps are expected to have a V/C ratio less than 1.0 during the AM and PM peak hours under Cumulative Conditions with or without the proposed project (i.e., there is sufficient capacity to serve expected demand). The off-ramp from northbound US 101 to Woodside Road is projected to be close to capacity (V/C ratio = 0.99) by 2020. All other ramps are projected to have a V/C ratio of 0.88 or less.

Table 3.4-21
US 101 Freeway Ramp Capacity Analysis –
Cumulative With Proposed Project Conditions

		AM Peak Hour			PM Peak Hour		
Weaving Segment	**Capacity[1]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**
Southbound US 101 Off-Ramp/Veterans Boulevard	3,800	2,429	47	0.64	2,061	32	0.54
Northbound US 101 On-Ramp/Whipple Avenue	1,900	1,545	33	0.81	1,161	39	0.61
Southbound US 101 On-Ramp/Woodside Road	2,000	1,531	44	0.77	1,698	52	0.85
Northbound US 101 Off-Ramp/Woodside Road	1,900	1,681	64	0.88	1,881	43	0.99

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Capacity based on information presented in Chapter 25 of the *2000 Highway Capacity Manual*.
2. Volumes obtained by applying a 0.5-percent growth factor per year to existing count data provided by Caltrans plus traffic from approved and pending projects plus traffic from the proposed project.
3. V/C = Volume-to-Capacity Ratio.

Higher Occupancy Scenario - Cumulative (Year 2020) Conditions. The Higher Occupancy Scenario was developed to address the possibility that Kaiser's projections for future occupancy of the MOBs could be underestimated. The City engaged an independent health care consultant, the James Brinkley Company, to derive this alternative scenario. In addition to the increased hospital bed occupancy and growth in the emergency room visits, the Higher Occupancy Scenario assumes that an additional 105 providers could be onsite at the Redwood City Kaiser Medical Center, compared to the Kaiser projection of 23 additional providers. The impacts of the Cumulative with Higher Occupancy Scenario Conditions are presented below.

TR-10. Intersection Operations under Cumulative with Higher Occupancy Scenario Conditions - *Under the Cumulative with Higher Occupancy Scenario Conditions, the intersections at Maple Street/Marshall Street, Whipple Avenue/Veterans Boulevard, Hansen Way/Veterans Boulevard, and Woodside Road/Veterans Boulevard are projected to operate an unacceptable levels. (S)*

Trip Generation. The trip generation estimates for the proposed project were revised to include the 105 on-site new providers associated with the Higher Occupancy Scenario. The revised trip generation estimates are presented in Table 3.4-22.

Table 3.4-22
Higher Occupancy Scenario Trip Generation Estimates[1]

		Weekday		AM Peak Hour				PM Peak Hour			
Land Use	**Size**	**Rate[2]**	**Trips**	**Rate[2]**	**In[3]**	**Out[3]**	**Total**	**Rate[2]**	**In[3]**	**Out[3]**	**Total**
Emergency Room	52 patients	6.0	312	0.60	16	15	31	0.60	15	16	31
Hospital	40 new occupied beds	15.7	628	1.43	41	16	57	1.63	22	43	65
MOB	105 new providers	95.0	9,975	10.9	572	576	1,148	8.6	518	389	907
Office	40,000 GSF	11.0	440	1.55	55	7	62	1.50	10	50	60
Total			*11,355*		*684*	*615*	*1,299*		*565*	*498*	*1,063*

Source: Fehr & Peers Associates, October 2002.

Notes:

1. Trip generation is for increases in hospital bed occupancy, emergency room visits, medical office building (MOB) space, plus relocated administrative staff from off-campus office space. See text for details.
2. Trip generation rates for emergency room in trips per patient. Rate estimated at six trips per patient. Trip generation rates for hospital are in trips per occupied bed. Trip rates developed by dividing trip rates presented in the ITE *Trip Generation,* Sixth Edition, by 0.75 which is the average proportion of occupied beds based on information from Health Facility Planning and Design (City consultant). Trip generation rates for MOBs in trips per provider based on rates developed from driveway counts conducted at the Roseville Kaiser MOB complex. Trip generation rates for office in trips per 1,000 s.f. from ITE *Trip Generation*, Sixth Edition.
3. Inbound and outbound splits from counts conducted at the Roseville Kaiser MOB complex and ITE. Number of trips are net new trips over existing trip generation.

The Higher Occupancy Scenario is expected to generate 11,355 daily trips, 1,299 AM peak hour trips (684 inbound/615 outbound), and 1,063 PM peak hour trips (565 inbound/498 outbound). By comparison, the proposed project was estimated to generate 3,565 new daily trips, 402 AM peak hour trips, and 354 PM peak hour trips.

Cumulative Intersection Volume Estimates. The trips expected to be generated by the Higher Occupancy Scenario were assigned to the roadway system using the expected directions of approach and departure described under Project Conditions. These trips assignments were added to the Cumulative No Project Conditions volumes to estimate cumulative intersection volumes under this scenario.

Cumulative Intersection Level of Service. LOS was calculated for the study intersections using cumulative traffic volumes plus traffic from the Higher Occupancy Scenario. Table 3.4-23 presents the LOS results under Cumulative with Higher Occupancy Scenario Conditions. The results of the analysis indicate the Higher Occupancy Scenario would significantly exacerbate operations at four locations by increasing average delay by five or more seconds. The remaining study intersections are expected to operate at an acceptable level during the AM and PM peak hours.

Maple Street/Marshall Street. This intersection is expected to operate at an unacceptable level (LOS E) during the PM peak hour under this scenario. Under Cumulative with Higher Occupancy Scenario Conditions, intersection volumes are expected to satisfy the Caltrans Peak Hour Volume for traffic signal installation. Therefore, the Higher Occupancy Scenario in combination with regional growth and traffic from pending projects in the area is expected to result in a significant cumulative impact on the Maple Street/Marshall Street intersection.

Whipple Avenue/Veterans Boulevard. This intersection is expected to operate at an unacceptable LOS F during the AM and PM peak hours. The addition of Higher Occupancy Scenario traffic is expected to increase the average delay at the intersection by 15.4 seconds during the AM peak hour and 5.1 seconds during the PM peak hour. Therefore, the Higher Occupancy Scenario in combination with regional growth and traffic from pending projects in the area is expected to result in a significant cumulative impact on the Whipple Avenue/Veterans Boulevard intersection during the AM and PM peak hours.

Hansen Way/Veterans Boulevard. This intersection is expected to operate at an unacceptable LOS F during the AM and PM peak hours. The Higher Occupancy Scenario is expected to increase the average delay at the unsignalized intersection by more than 5.0 seconds. Volumes on the minor street are not expected to meet the minimum volume requirement of 100 vehicles to satisfy the Caltrans Peak Hour Volume Warrant (although the minor street is expected to have 94 peak-hour vehicles during the PM peak hour). Therefore, the Higher Occupancy Scenario, in combination with regional growth and traffic from pending projects, is expected to have a less-than-significant cumulative impact on the Hansen Way/Veterans Boulevard intersection.

Table 3.4-23
Intersection Level of Service Summary –
Cumulative No Project and Higher Occupancy Scenario Cumulative Conditions

Intersection	Peak Hour	No Project Conditions		With Higher Occupancy Scenario Conditions		Change in Average Delay[3]
		Delay[1]	LOS[2]	Delay[1]	LOS[2]	
#1 Walnut Street/	AM	12.4	B	15.2	C	+2.8
Marshall Street	PM	11.6	B	13.9	B	+2.3
#2 Marshall Court/	AM	10.5	B	12.5	B	+2.0
Marshall Street	PM	11.4	B	13.6	B	+2.2
#3 Maple Street/	AM	11.7	B	15.9	C	+4.2
Marshall Street	PM	21.7	C	**39.7**	**E**	**+18.0**
#4 Chestnut Street/	AM	13.4	B	16.1	C	+2.7
Marshall Street	PM	15.7	C	19.0	C	+3.3
#5 Main Street/	AM	14.7	B	18.0	C	+3.3
Bradford Street	PM	20.8	C	28.6	D	+7.8
#6 Walnut Street/	AM	7.9	A	8.6	A	+0.7
Bradford Street	PM	8.6	A	9.3	A	+0.7
#7 Whipple Avenue/	AM	82.1	F	**97.5**	**F**	**+15.4**
Veterans Boulevard	PM	84.6	F	**89.7**	**F**	**+5.1**
#8 Jefferson Avenue/	AM	20.5	C	22.8	C	+2.3
Veterans Boulevard	PM	32.7	C	33.5	C	+0.8
#9 Main Street/	AM	20.8	C	21.6	C	+0.8
Veterans Boulevard	PM	30.1	C	31.0	C	+0.9
#10 Walnut Street/	AM	20.4	C	24.9	C	+4.5
Veterans Boulevard	PM	32.5	C	38.3	D	+5.8
#11 Maple Street/	AM	27.9	C	29.9	C	+2.0
Veterans Boulevard	PM	37.5	D	40.0	D	+2.5
#12 Hansen Way/	AM	35.2	E	57.7	F	+22.5
Veterans Boulevard	PM	104.1	F	> 180	F	+124.6
#13 Chestnut Street/	AM	16.8	B	17.6	B	+0.8
Veterans Boulevard	PM	19.0	B	23.6	C	+4.6
#14 Woodside Road/	AM	47.2	D	**78.8**	**E**	**+31.6**
Veterans Boulevard	PM	114.2	F	**151.5**	**F**	**+37.3**

Source: Fehr & Peers Associates, January 2003.

Notes:

1. Signalized intersection LOS based on average control delay expressed in seconds per vehicle. Unsignalized intersection LOS based on average total control delay expressed in seconds per vehicle. Signalized and unsignalized analysis methodologies obtained from the *2000 Highway Capacity Manual,* Transportation Research Board.
2. Level of service.
3. "Change in Average Delay" is the change in the average delay between "No Project" and "With Project" conditions.

Significant cumulative impacts indicated in **bold** type.

Woodside Road/Veterans Boulevard. This intersection is expected to operate at an unacceptable LOS E during the AM peak hour and an unacceptable LOS F during the PM peak hour with the addition of traffic from the Higher Occupancy Scenario. This scenario is expected to increase the average delay by more than 5.0 seconds during the AM and PM peak hour and is also expected to degrade intersection operates during the AM peak hour from LOS D to LOS E. Therefore, the proposed project in combination with regional growth and traffic from pending projects, is expected to have a significant cumulative impact on the Woodside Road/Veterans Boulevard intersection during the AM and PM peak hours.

MITIGATION MEASURES. The following mitigation measures would reduce Cumulative with Higher Occupancy Scenario Conditions to a less-than-significant effect. However, the feasibility of implementing these measures is unlikely and therefore the impacts at the intersections of Whipple Avenue/Veterans Boulevard and Woodside Road/Veterans Boulevard are expected to remain significant and unavoidable. Approval of the Higher Occupancy Scenario would require a Statement of Overriding Considerations by the Redwood City Council. (SU)

TR-10.1 Contribute to Maple Street/Marshall Street Intersection Improvements. To mitigate Cumulative with Higher Occupancy Scenario Conditions impacts at the Maple Street/Marshall Street intersection, a traffic signal would need to be installed. The project sponsor shall contribute its fair share to the design and installation of the signal, which would enable the intersection to operate at LOS B during the AM and PM peak hours.

TR-10.2 Contribute to Whipple Avenue/Veterans Boulevard Intersection Improvements. An improvement has been identified for this intersection in the *Redwood City Traffic Impact Mitigation Fee Study* (TIMFS). The identified improvement includes the addition of a dedicated northbound right-turn lane. However, the LOS analysis conducted for this EIR indicates that this improvement alone would not provide acceptable operations during the AM or PM peak hours under Cumulative with Higher Occupancy Scenario Conditions.

In addition to the TIMFS-identified additional northbound right-turn lane, to mitigate the Cumulative with Higher Occupancy Scenario Conditions impact (i.e., to achieve LOS D at this intersection), the following improvements would be needed:

- Add a second southbound left-turn lane;
- Add a dedicated northbound left-turn lane and change northbound left-turns from permitted to protected phasing;
- Restripe the existing northbound shared through/left-turn lane as a dedicated through lane;

- Provide a "green-arrow" for eastbound right-turns while the northbound left-turn phase is occurring creating an "overlap" right-turn phase. This would also require prohibiting northbound U-turns.

With these improvements, the intersection is expected to operate at LOS D during the AM and PM peak hours. It should be noted that improvements to the northbound approach would require widening the roadway and are likely be infeasible due to right-of-way constraints. Additionally, improvements to the southbound approach may require modifications to the Whipple Avenue overpass and will likely require coordination with Caltrans. As such, the potential impact at this location would remain significant and unavoidable.

TR-10.3 Contribute to Hansen Way/Veterans Boulevard Intersection Improvements. It is recommended that the intersection be monitored in a similar manner as other unsignalized intersections in Redwood City to determine if signalization would be warranted in the future. If the intersection were to become signalized under Cumulative with Higher Occupancy Scenario Conditions, the intersection is expected to operate at LOS A during the AM and PM peak hours.

TR-10.4 Contribute to Woodside Road/Veterans Boulevard Intersection Improvements. The same improvements identified in Mitigation Measure 6.1 for this intersection for Cumulative with Proposed Project Conditions would apply under the Higher Occupancy Scenario. With these improvements, the intersection is expected to operate at LOS C during the AM peak hour and LOS D during the PM peak hour, the same as described for Cumulative with Proposed Project Conditions. As before, these improvements were considered to be infeasible and thus the impact would remain significant and unavoidable.

TR-11. US 101 Freeway Segments under Cumulative with Higher Occupancy Scenario Conditions - *Under the Cumulative with Higher Occupancy Scenario Conditions, the southbound US 101 mixed flow lanes from SR 92 to Whipple Avenue and from Woodside Road to Marsh Road would be significantly affected by Higher Occupancy Scenario traffic. (S)*

Study segments of US 101 were reviewed during the AM and PM peak hours to determine if a significant amount of Higher Occupancy Scenario traffic would be added to these freeway segments under Cumulative Conditions. The results of the AM peak hour freeway segment capacity analysis are summarized in Table 3.4-24. The results of the PM peak hour freeway segment analysis are summarized in Table 3.4-25.

During the AM peak hour, the estimated volume of vehicles in the southbound US 101 mixed-flow lanes from SR 92 to Whipple Avenue and from Woodside Road to Marsh Road is expected to exceed the freeway segment capacity with or without the Higher Occupancy Scenario. During the AM peak hour, all other study segments are expected to have V/C ratios

Table 3.4-24
AM Peak Hour US 101 Freeway Segment Capacity Analysis – Higher Occupancy Scenario Cumulative Conditions

Freeway Segment	Lane Type	Capacity[1]	Cumulative No Project Conditions		Project Trips	Higher Occupancy Scenario		Percent Impact[4]
			Volume[2]	V/C[3]		Volume	V/C[3]	
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	9,452	1.03	135	9,587	**1.04**	**1.47%**
SB Woodside Rd to Marsh Rd	Mixed-Flow	6,900	8,445	1.22	143	8,588	**1.24**	**2.07%**
	HOV	1,800	1,242	0.69	23	1,265	0.70	1.28%
NB Marsh Rd to Woodside Rd	Mixed-Flow	6,900	5,674	0.82	155	5,829	0.84	2.25%
	HOV	1,800	973	0.54	27	1,002	0.56	1.50%
NB Whipple Rd to SR 92	Mixed-Flow	9,200	7,666	0.83	123	7,789	0.85	1.34%

Source: Fehr & Peers Associates, January 2003.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained by applying a growth factor of 0.5 percent per year to existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

Significant impacts shown in **BOLD** type.

Table 3.4-25
PM Peak Hour US 101 Freeway Segment Capacity Analysis – Higher Occupancy Scenario Cumulative Conditions

Freeway Segment	Lane Type	Capacity[1]	Cumulative No Project Conditions		Project Trips	Higher Occupancy Scenario		Percent Impact[4]
			Volume[2]	V/C[3]		Volume	V/C[3]	
SB SR 92 to Whipple Ave	Mixed-Flow	9,200	8,502	0.92	113	8,615	0.94	1.23%
SB Woodside Rd to Marsh Rd	Mixed-Flow	6,900	6,988	1.01	115	7,103	**1.03**	**1.67%**
	HOV	1,800	1,027	0.57	19	1,046	0.58	1.06%
NB Marsh Rd to Woodside Rd	Mixed-Flow	6,900	4,377	0.63	132	4,509	0.65	1.91%
	HOV	1,800	699	0.39	21	720	0.40	1.17%
NB Whipple Ave to SR 92	Mixed-Flow	9,200	6,863	0.75	100	6,963	0.76	1.09%

Source: Fehr & Peers Associates, January 2003.

Notes:

1. Capacity assumes 2,300 vehicles per hour per lane for mixed-flow lanes and 1,800 vehicles per hour per lane for HOV lanes. Auxiliary lane capacity not included in the freeway segment capacity analysis.
2. Volumes obtained by applying a growth factor of 0.5-percent per year to existing count data provided by Caltrans.
3. V/C = Volume-to-Capacity Ratio.
4. Percent Impact determined by dividing the number of project trips by the freeway segment's capacity.

Significant impacts shown in **BOLD** type.

less than 1.0. During the PM peak hour, the capacity of the southbound US 101 mixed-flow lanes is expected to be exceeded from Woodside Road to Marsh Road under Cumulative No Project and Cumulative with Higher Occupancy Scenario Conditions. All other study segments are expected to have V/C ratios less than 1.0 during the PM peak hour.

The addition of traffic associated with the Higher Occupancy Scenario is expected to be greater than one percent of both freeway segments' capacities. This constitutes a significant cumulative impact on the southbound US 101 mixed-flow lanes from SR 92 to Whipple Avenue and from Woodside Road to Marsh Road during the AM peak hour and on the southbound US 101 mixed-flow lanes from Woodside to Marsh Road during the PM peak hour.

MITIGATION MEASURE. The following mitigation measures would reduce Cumulative with Higher Occupancy Scenario Conditions to a less-than-significant effect. However, the feasibility of implementing these measures is unlikely and therefore the impacts are expected to remain significant and unavoidable. Approval of the Higher Occupancy Scenario would require a Statement of Overriding Considerations by the Redwood City Council. (SU)

TR-11.1 *Contribute to Construction of An Additional Southbound US 101 Lane*. Full mitigation of this impact to a less-than-significant level would require the addition of another southbound through lane to both segments. The addition of another through travel lane, with a design capacity of 2,300 vplph, would more than offset the addition of traffic generated by the Higher Occupancy Scenario. However, freeway widening is generally considered to be beyond the scope of a single development project, i.e., an infeasible mitigation requirement. Therefore, the effect of Higher Occupancy Scenario traffic on the southbound segments of US 101 is considered to represent a significant unavoidable cumulative impact. To minimize this impact the Higher Occupancy Scenario could implement a transportation demand management (TDM) program.

TR-12. US 101 Ramp Operations under Cumulative with Higher Occupancy Scenario Conditions - *The Cumulative with Higher Occupancy Scenario Conditions would exceed the capacity of the northbound US 101 off-ramp to Woodside Road during the PM peak hour. (S)*

Operations of the study freeway ramps were reviewed by conducting a volume-to-capacity analysis under Higher Occupancy Scenario Cumulative Conditions. The purpose of the analysis was to verify that the freeway ramps would have sufficient capacity to serve demand under Higher Occupancy Scenario Cumulative Conditions.

Trips generated by the Higher Occupancy Scenario were added to volumes that were estimated under Cumulative No Project Conditions. The results of the volume-to-capacity analysis are presented in Table 3.4-26. The results of the analysis indicate that the northbound US 101 off-ramp to Woodside Road is expected to have a volume-to-capacity ratio (V/C) of 0.95 and 1.05 during the AM and PM peak hours, respectively. In other words, traffic from the Higher Occupancy Scenario plus traffic associated with regional growth is expected to add sufficient

Table 3.4-26
US 101 Freeway Ramp Capacity Analysis –
Higher Occupancy Scenario Cumulative Conditions

		AM Peak Hour			PM Peak Hour		
Weaving Segment	**Capacity[1]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**	**Volume[2]**	**Project Trips**	**Project V/C[3]**
Southbound US 101 Off-Ramp/Veterans Boulevard	3,800	2,517	135	0.66	2,142	113	0.56
Northbound US 101 On-Ramp/Whipple Avenue	1,900	1,635	123	0.86	1,222	100	0.64
Southbound US 101 On-Ramp/Woodside Road	2,000	1,653	166	0.83	1,780	134	0.89
Northbound US 101 Off-Ramp/Woodside Road	1,900	1,799	182	0.95	1,991	153	1.05

Source: Fehr & Peers Associates, January 2003.

Notes:

1. Capacity based on information presented in Chapter 25 of the *2000 Highway Capacity Manual*.
2. Volumes obtained by applying a 0.5-percent growth factor per year to existing count data provided by Caltrans plus traffic from approved and pending projects plus traffic from the proposed project.
3. V/C = Volume-to-Capacity Ratio.

traffic to this off-ramp during the PM peak hour such that the ramp volumes would exceed the capacity of the off-ramp. This constitutes a significant cumulative impact on the northbound US 101 Off-Ramp to Woodside Road during the PM peak hour.

All other study ramps are expected to have V/C ratios less than 1.00 under Higher Occupancy Scenario Cumulative Conditions.

MITIGATION MEASURE. The following mitigation measures would reduce Cumulative with Higher Occupancy Scenario Conditions to a less-than-significant effect. However, the feasibility of implementing these measures is unlikely and therefore the impact is expected to remain significant and unavoidable. Approval of the Higher Occupancy Scenario would require a Statement of Overriding Considerations by the Redwood City Council. (SU)

TR-12.1 *Contribute to Construction of Another Ramp Lane at the Northbound US 101 Off-Ramp to Woodside Road.* Full mitigation of this impact to a less-than-significant level would require the addition of another lane on the off-ramp. The addition of another ramp lane would more than offset the number of project trips being added to the ramp (153 trips during the PM peak hour). However, freeway ramp widening is generally considered to be beyond the scope of a single development project, i.e., an infeasible mitigation requirement. Therefore, the effect of Higher

Occupancy Scenario traffic on this off-ramp is considered to represent a significant unavoidable cumulative impact. To minimize this impact the Higher Occupancy Scenario could implement a transportation demand management (TDM) program.

TR-13. Parking Supply and Demand under the Higher Occupancy Scenario - *The Higher Occupancy Scenario would provide sufficient onsite parking spaces to meet the projected parking demand. (LTS)*

The Higher Occupancy Scenario indicated that the MOBs could accommodate a total of 105 new providers or 82 more providers than what was analyzed under Project Conditions. Under Project Conditions (using Kaisers estimates), it was determined that the proposed project would require 485 new parking spaces to serve the expected demand.

The 82 additional providers associated with the Higher Occupancy Scenario are expected to generate an *additional* parking demand of 717 parked cars which would require a minimum supply of 789 *additional* parking spaces to account for circulation and turnover. Therefore, a minimum of 1,274 parking spaces would be required with the Higher Occupancy Scenario. The project, as proposed, would provide 1,574 new parking spaces. Thus, the proposed supply is expected to accommodate the expected demand for the Higher Occupancy Scenario and no parking deficiencies are anticipated.