

4.0 IMPACT ANALYSIS

The impact analysis is conducted according to CEQA guidelines and significance criteria, as explained in the “Study Method” sections that introduce each environmental topic area in this chapter. The impact analysis considers potentially significant and significant effects produced by the No-Project Alternative compared with the Streetcar Project Alternative (proposed project). If impacts are identified because the alternative exceeds CEQA or local thresholds, mitigations are proposed and the level of significance after mitigation is described under Determination. Cumulative impacts, defined as two or more individual effects which, when considered together, are either significant or “cumulatively considerable,” are also examined. Cumulative impacts can result from individually minor but collectively significant projects (CEQA Guidelines §15355). A list of development projects in the study area that would occur in the same time frame as the proposed project and would therefore be used in the comparative analysis are included in Table 4-1. These projects, which have been approved for development, would happen regardless of the proposed project and, as such, are incorporated into the No-Project analysis. For the purpose of this analysis, it is anticipated that most development projects would be completed by 2012. In addition, the analysis includes the potential for generalized cumulative impacts.

4.1 Land Use and Planning

4.1.1 Study Methods and Significance Criteria

An adverse impact on land use would occur if the proposed project would physically divide an established community; conflict with any applicable land use plan, policy, or regulation; or change land use in a manner that would be incompatible with surrounding land uses.

4.1.2 Impact Analysis

4.1.2.1 No-Project Alternative

Implementation of the No-Project Alternative would include construction associated with planned roadway and streetscape improvement projects and development plans. Construction phasing and traffic handling plans would be implemented to minimize disruption and maintain access to land uses in the study area, which are predominantly commercial and mixed-use (retail or commercial and residential). Because these projects would be completed within a relatively short time, these activities would not be expected to cause substantial changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character, and would be considered less than significant.

Development plans for West Sacramento’s redevelopment areas and downtown Sacramento include increased residential, commercial, and civic land use development, which would generate additional travel demand on local transit and roadways (see Section 3.1, Land Use and Planning; and Section 3.5, Transportation). The City of West Sacramento and City of Sacramento land use plans include goals to improve transit within and between these two growth areas.

4.1.2.2 Streetcar Project Alternative

Construction Impact Analysis

Impact LU-1: Land uses within the study area may be affected by dust, noise, and vibration associated with construction activities.

Construction of the Streetcar Project Alternative would occur within the existing public right-of-way between the West Sacramento Civic Center and 15th Street in downtown Sacramento, except for existing RT tracks and platforms that would be used between Capitol Mall/7th Street and K Street/12th Street in downtown Sacramento. Construction activities would occur over a relatively short time because the streetcar alignment would be constructed in three-block segments that would take approximately 3 weeks each to construct (see Section 2.3). Although substantial change in land use would not occur because of project construction, temporary effects on land uses may occur from construction equipment air emissions, noise and vibration. These potential impacts would be mitigated as indicated in Section 4.8, Air Quality; and Section 4.9, Noise and Vibration. No other construction impacts on land use would be expected.

Mitigation. No mitigation is required.

Determination. Construction activities would not cause substantial changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character. Therefore, land use construction impacts associated with the Streetcar Project Alternative would be less than significant.

Operation Impact Analysis

Impact LU-2: Potential to be inconsistent with land use plans and goals.

The Streetcar Project Alternative would be consistent with the City of West Sacramento and City of Sacramento land use plan goals of improving transit within and between the planned growth areas in West Sacramento's redevelopment area and downtown Sacramento. Development plans for these areas include significant increases in residential, commercial, and civic land use development, which would generate additional travel on local transit and roadways (see Section 3.1, Land Use and Planning, and Section 3.5, Transportation). The additional capacity of an alternative transit mode would better provide for this growth and would benefit surrounding land uses by improving access to commercial and residential development near streetcar stations, a beneficial impact.

The streetcar platforms and track would be located within the existing public right-of-way between the West Sacramento Civic Center and 15th Street in downtown Sacramento. Additional pedestrian crosswalks would be created and some curbs would be realigned. These improvements and operation of the Streetcar Project Alternative would enhance the physical environment but would not cause substantial changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character.

Mitigation. No mitigation is required.

Determination. Operation of the Streetcar Project Alternative would not cause substantial changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character, but would support land use and redevelopment goals of the cities, a beneficial impact.

Table 4-1. Sacramento and West Sacramento Development Projects

ID	PROJECT	SIZE	STATUS	OCCUPANCY ASSUMPTION (%)	2005 - 2010 CHANGE IN OCCUPANCY	SOURCE
WS2	TRIBECA WEST	82 du	Tentative Map Approved	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS3	TOWER COURT	106 du / 15000 sf office	In Negotiation	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS1	Civic Center Master Plan / Los Rios Community College Site	25000sf Classrooms / Office - 15000sf Library / Office	Complete 2009 /Preliminary Design	90	22500 office sf	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS4	IRONWORKS	196 du	In construction	90	176	http://www.nehemiahcorp.org/nehemiahnews/121704.cfm
WS5	ROBINSON PROPERTY	800 du	Developer Optioned, no application yet	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS6	DELTA LANE	35000 office sf	In Negotiation	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS7	UNGER PROPERTY	208 rm hotel / 30000 sf office / 84500 sf retail, 791 du	Incomplete Application Submitted	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS8	RIVER ONE (RALEY'S LANDING)	200 rm hotel / 245000 sf office / 42000 sf retail / 100 du	Entitled; No Application	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS9	RIVER TWO (RALEY'S LANDING)	150 du	Entitled; application for building permit pending	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS10	WASHINGTON SQUARE	167 du / 4000 sf retail	Incomplete Application Submitted	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS11	River Three/CalSTRS HQ (Raley's Landing)	400000 sf / office	Under Construction	90	360000 office sf	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
WS12	THE TRIANGLE			-	0	http://www.bizjournals.com/sacramento/stories/2004/08/02/story4.html
WS13	FULCRUM PROPERTY	2000000 sf office, 20000 retail sf, 2300 du	In Environmental review	-	0	http://www.cityofwestsacramento.org/cityhall/departments/comdev/default.cfm
S1	WESTFIELD DOWNTOWN PLAZA	1198229 retail sf	TBD	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S2	CALPERS ON CAPITOL MALL	65000 sf retail, 230 hotel rms, 804 housing units	Under Construction	90	58500 retail sf; 207 hotel rms; 724 du	http://www.downtownsac.org/index.php?mvcTask=projects
S3	US BANK TOWER/ 621 CAPITOL MALL	344289 office sf; 23000 retail sf	Under Construction	90	309861 office sf; 20700 retail sf	http://www.downtownsac.org/index.php?mvcTask=projects
S4	PLAZA FIVE FIFTY FIVE	Data Unavailable	Opened 2004	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S5	AURA	11500 retail sf, 283 du	Under Construction	90	10350 retail sf, 255 du	http://www.downtownsac.org/index.php?mvcTask=projects
S41	PING YUEN	82 du	Jun-04	95	80 du	http://www.pingyuenapts.com/
S42	MARSHALL HOTEL	150 Hotel rooms	UNKNOWN	-	0	CITY OF SACRAMENTO
S8	7TH & L	10500 retail sf, 240000 office sf, 80 du	Under Construction / Complete fall '08	90	9450 retail sf, 21500 office sf, 72 du	http://www.downtownsac.org/index.php?mvcTask=projects
S9	HOTEL JOIE DE VIVRE	11000 retail sf, 200 hotel rms	Under Construction / Complete 12-2007	90	9900 retail sf, 180 hotel rms	http://www.downtownsac.org/index.php?mvcTask=projects
S10	800 K STREET	17730 retail sf, 570 Du	Application in process	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S11	ELKS BUILDING	14000 retail sf, 70000 office sf	Estimated Completion: 2007	95	13300 retail sf, 66500 office sf	http://www.downtownsac.org/index.php?mvcTask=projects
S12	PLAZA LOFTS	21000 retail sf, 225 du	Completed	95	19950 retail sf, 214 du	http://www.downtownsac.org/index.php?mvcTask=projects
S13	Zeiden/Corritore Proposal	56000 retail sf	Groundbreaking Fall 2008	90	50400 retail sf	http://www.downtownsac.org/index.php?mvcTask=projects
S14	LIBRARY LOFT	5000 retail sf, 30000 office sf, 295 du	Application in process	-	0	http://www.downtownsac.org/?mvcTask=projects&id=136&categoryID=0
S15	HALE BUILDING LOFTS	12,000 Retail Square Feet; 33 du	Under Construction	90	10800 retail sf, 30 du	http://www.downtownsac.org/index.php?mvcTask=projects
S20	CAPITOL GRAND TOWER	5000 retail sf, 200 hotel rms, 85 du	Under Construction	90	4500 retail sf, 180 hotel rms, 77 housing units	http://www.downtownsac.org/index.php?mvcTask=projects
S21	EPIC TOWER	14000 retail sf, 70000 office sf	TBD	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S22	MARRIOTT RESIDENCE INN	236 rm hotel, 55200 sf retail, 30 du	Complete	95	225 hotel rms, 52440 retail sf, 29 du	http://www.downtownsac.org/index.php?mvcTask=projects
S23	ELLIOT BUILDING	18 du	Complete	95	17 du	http://www.downtownsac.org/index.php?mvcTask=projects
S24	MERIDIAN PLAZA II	240000 office sf existing / 460000 proposed	Groundbreaking late 2006	95	43700 office sf	http://www.downtownsac.org/index.php?mvcTask=projects
S38	HOTEL ORLEANS	26000 retail Sf, 15du	Dec-07	95	24700 retail sf, 14 du	http://www.downtownsac.org/?mvcTask=projects&id=107&categoryID=4
S6	500 N STREET	123 du	Complete	95	117 du	http://www.downtownsac.org/index.php?mvcTask=projects
S7	500 CAPITOL MALL	27124 retail sf, 467942 office sf	Complete	95	24411 retail sf, 444545 office sf	http://www.downtownsac.org/index.php?mvcTask=projects
S39	CROCKER ART MUSEUM EXPANSION	100000 ADDITIONAL SF	Dec-07	100	100000 add. Sf	http://www.downtownsac.org/
S27	THE DOCKS	350000sf mixed use	TBD	-	0	http://www.cityofsacramento.org/econdev/DocksAreaProject.htm
S28	L St Lofts	92 du , retail sf 5850	est completion: 6/2007	95	87 du, 5558 retail sf	http://www.downtownsac.org/?mvcTask=projects&id=126&categoryID=0
S29	GLOBE MILLS	143 du	est completion: 10/2007	95	136 du	http://www.downtownsac.org/?mvcTask=projects&id=127&categoryID=0
S30	FREMONT MEWS	119 du	Completed	95	113 du	http://www.fremontmews.com/
S31	PERFORMING ARTS CENTER	total sf 46000	Under Construction	-	0	http://www.downtownsac.org/index.php?mvcTask=projects&id=61&categoryID=3
S32	R STREET MARKET	72449 retail sf,11 du	Completed 2006	95	68827 retail sf,10 du	http://www.downtownsac.org/?mvcTask=projects&id=124&categoryID=0
S40	ST ANTON BLDG	65 Du / 3000 retail sf	Jun-06	95	61.75 Dus / 2850 retail sf	http://antonllc.com/properties/st_anton_building.htm
S25	1801 L STREET	225 apts / 9600 retail sf	Completed	95	214 du / 9120 retail sf	http://www.downtownsac.org/index.php?mvcTask=projects
S45	16th & H / Cooper Union Bldg	Residential & mixed Use 13 du	Under Construction	90	12 du	CITY OF SACRAMENTO
S16	CAPITOL WEST END PROJECT	1.4 million office sf	TBD	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S17	CATHEDRAL SQUARE CONDOMINIUMS	10100 retail sf, 233 du	Groundbreaking 2007	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S18	THE CATHEDRAL BUILDING	9075 retail sf; 46000 office sf; 23 du	Completed	95	8168 retail sf; 43700 office sf; 22 du	http://www.thecathedralbuilding.com/
S19	THE METROPOLITAN	13000 retail sf, 320 du	Application in process	-	0	http://www.downtownsac.org/index.php?mvcTask=projects
S43	1012 K Street	130 condo units:12,600 sf retail	EIR < 2009	90	117 du, 11340 retail sf	CITY OF SACRAMENTO
S44	1000 K Street Redevelopment	38,000 sq. ft. retail (restaurant/cabaret); 12,000 sf office	Under Construction	90	34200 retail sf, 10800 office sf	CITY OF SACRAMENTO
S33	EAST END GATEWAY	130 du	UNKNOWN	-	0	http://www.cadanet.org/eeg.php
S34	EAST END GATEWAY 2	35 du	Jun-08	90	31 du	http://www.cadanet.org/eeg.php
S35	EAST END GATEWAY 3	26 du	Jun-08	90	23 du	http://www.cadanet.org/eeg.php
S36	EAST END GATEWAY 4	35 du	UNKNOWN	-	0	http://www.cadanet.org/eeg.php
S37	MARRS	25000 retail sf	2008	90	22500 retail sf	http://downtownsac.org/index.php?mvcTask=projects&id=135&categoryID=0
S26	RAILYARDS	11000 du, 1300000 retail sf, 2900000 office sf, 1000 hotel rms	TBD	-	0	http://www.sacramentorailyards.com

Note: Projects in West Sacramento are shaded.

*Cumulative Impact Analysis***Impact LU-3: Potential to contribute to cumulative changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character.**

As stated in Impact LU-2, operation of the Streetcar Project Alternative is not expected to produce substantial changes in land use, physically divide existing neighborhoods, or significantly affect neighborhood character. Changes in land use occurring as part of planned development under the No-Project Alternative would not be affected by the Streetcar Project Alternative. As a result, the proposed project would not contribute to potential cumulative land use effects resulting from planned development in the study area.

Mitigation. No mitigation is required.

Determination. The proposed project would not substantially contribute to cumulative impacts on land use.

4.2 Population and Housing

4.2.1 Study Methods and Significance Criteria

This impact analysis evaluates whether the proposed project would induce substantial population growth, displace a substantial number of the existing housing units, or displace a substantial number of existing people. This analysis is accomplished by using the existing and future conditions of the study area and determining how these would change under the proposed project.

In accordance with CEQA, a population and housing impact is considered significant if the Streetcar Project Alternative or No-Project Alternative would result in the following:

- Induce substantial growth or concentration of population growth in an area directly or indirectly; or
- Displace an amount of existing housing or people substantial enough to lead to the construction of replacement housing elsewhere.

4.2.2 Impact Analysis

4.2.2.1 No-Project Alternative

The No-Project Alternative is not anticipated to displace a substantial amount of existing housing or people, because the existing transit services and roadway configurations would remain in their present state and planned development will largely occur on vacant or underutilized land. Development could induce substantial population growth in West Sacramento, an unavoidable impact.

4.2.2.2 Streetcar Project Alternative

Construction Impacts

Impact PH-1: Potential to contribute to substantial changes in population, housing, and employment due to project construction.

The proposed project would incorporate the streetcar into the existing built environment while minimizing construction. The proposed project would have a direct impact to employment by adding approximately 43 temporary jobs during project construction, which will last

approximately 25 months¹. This impact is considered positive for Yolo and Sacramento County, because the proposed project could provide jobs to residents of Yolo and Sacramento County.

Project construction is not anticipated to increase the population of the study area because Yolo and Sacramento counties have a large construction workforce. The Sacramento, Yolo, Amador, Nevada, Placer, El Dorado, and Sierra Building and Construction Trades Councils have approximately 25,000 members, with the majority of the members residing in Sacramento County (Kelly, 2008). Due to the large population of construction workers in Sacramento and Yolo counties, it is anticipated that the 43 construction workers² associated with project construction would reside within Sacramento or Yolo County and not need to relocate.

Because these workers could be accommodated within existing communities and would not need to relocate, the construction of the proposed project would not affect housing within the study area. In addition, project construction would occur within the public right-of-way and would not displace housing. As a result, construction of the proposed project would not have a significant impact on area population or housing.

Mitigation. No mitigation is required.

Determination. Project construction is not anticipated to substantially induce population growth or displace people or housing.

Operation Impact Analysis

Impact PH-2: Potential to contribute to long-term changes in population, housing, and employment within local jurisdictions encompassing the study area.

Streetcar operation could indirectly induce growth near the proposed transit stations by increasing accessibility to transit and improving mobility along the route, and by providing an alternative for trips between West Sacramento and downtown Sacramento. The streetcar would lead to increased foot traffic around the stations, supporting economic development opportunities at and around the transit stations and indirectly increasing employment opportunities in the area, a beneficial impact. Given the large labor force available within Sacramento and Yolo counties, as mentioned above, it is anticipated that the majority of the jobs would be filled by residents of Sacramento and Yolo counties, so most of these workers would not need to relocate. Therefore, the proposed project would not induce substantial population growth in the area. Impacts on population or housing are less than significant.

Mitigation. No mitigation is required.

Determination. Operation of the proposed project is not anticipated to substantially induce population growth or displace people or housing.

¹ The number of construction workers was estimated from an analysis of the Downtown/Natomas/Airport Corridor Final Program EIR.

² The number of construction workers was estimated using the Roadway Construction Model Version 5.2.

Cumulative Impact Analysis

Impact PH-3: Potential to contribute to cumulative changes in population, housing, and employment.

As stated above, operation of the proposed project would not directly or indirectly induce substantial population growth. Growth in the study area will be caused by approved planned developments that would occur regardless of the proposed project (see Table 4-1 for a list of planned development projects used in the cumulative analysis). The proposed project would improve access and mobility to the proposed developments near the transit stations and help alleviate traffic in the study area that is related to growth. As a result, the proposed project is expected to reduce cumulative impacts caused by planned development, rather than contributing to area growth.

Mitigation. No mitigation is required.

Determination. Operation of the proposed project would not contribute to significant cumulative impacts on population growth or the displacement of housing or people.

4.3 Recreation and Parklands

4.3.1 Study Methods and Significance Criteria

Impacts on recreation facilities and parklands would result if the proposed project increased the use of existing neighborhood or regional parks or other recreation facilities such that substantial physical deterioration of the facility would occur or be accelerated. An impact would also occur if the proposed project included recreation facilities or required the construction or expansion of recreation facilities that might have an adverse physical effect on the environment.

4.3.2 Impact Analysis

4.3.2.1 No-Project Alternative

The No-Project Alternative may include construction associated with planned development, including roadway and streetscape improvement projects, lane reconfiguration, resurfacing, new lighting, tree planting, and landscaping that may temporarily affect access to recreation facilities and parklands in the study area. Construction associated with these projects would be completed within a relatively short time and may result in minimal disturbance to nearby recreation facilities and parklands. Development in the study area may increase use of existing recreation facilities or parklands and require the construction or expansion of recreation facilities or parklands, as indicated in redevelopment plans for the study area.

4.3.2.2 Streetcar Project Alternative

Construction Impact Analysis

Impact RP-1: Potential to temporarily affect parks and recreational facilities in the study area through project construction activities.

Construction of the Streetcar Project Alternative would occur within the existing public right-of-way. Recreation facilities and parklands are along the proposed streetcar alignment at River Walk Park, Saint Rose of Lima Park, and Capitol Park (see Figures 3-6 and 3-7). Access to River Walk Park would not be interrupted during construction because it is along the western bank of the Sacramento River and is accessed from E Street and 2nd Street. Saint Rose of Lima Park would not be affected during construction because the streetcar would operate on the

existing RT light rail alignment between 7th Street and 8th Street. The streetcar alignment would be constructed along the northern side of Capitol Park in the right (northern) lane of one-way L Street between 13th Street and 15th Street. Construction would temporarily affect traffic, parking, and pedestrian circulation near Capitol Park. These impacts are addressed in Section 4.5, Transportation. Construction phasing and traffic mitigations would be implemented to minimize disruption and maintain access to Capitol Park. Capitol Park users may also potentially be affected by dust, noise, and vibration impacts associated with construction, which is addressed in Section 4.8, Air Quality; and Section 4.9, Noise and Vibration. Construction adjacent to Capitol Park would be completed within a relatively short time because the streetcar alignment would be constructed in three-block segments that take approximately 3 weeks each to construct (see Section 2.3, Construction Activities). Construction of the Streetcar Project Alternative would not result in increased use of existing recreation facilities or parklands, or require the construction or expansion of recreation facilities or parklands. Therefore, no significant impacts on parks and recreation facilities are expected.

Mitigation. No mitigation is required.

Determination. No significant impacts on parks and recreation facilities are expected from project construction.

Operation Impact Analysis

Impact RP-2: Potential to require new parks and recreational facilities or permanently disrupt access to them.

The Streetcar Project Alternative would not result in the need for new or expanded recreation facilities or parkland. Because the streetcar would operate along busy thoroughfares, some of which already have light rail operation, the Streetcar Project Alternative is not expected to produce long-term effects on the physical condition of existing recreation facilities and parklands along the proposed streetcar alignment. Access to recreation and parklands may be improved along the proposed streetcar alignment, particularly in those areas closest to streetcar stations, resulting in a beneficial impact.

Mitigation. No mitigation is required.

Determination. Implementation of the Streetcar Project Alternative would not result in significant operational impacts on recreation facilities or parklands.

Cumulative Impact Analysis

Impact RP-3: Potential to contribute to increased demand on parks and recreational facilities due to cumulative development in the study area.

Implementation of planned development projects in the study area (see Table 4-1) would increase demand for neighborhood or regional parks or other recreation facilities because the number of dwelling units and commercial developments would significantly increase within the study area. However, implementation of the Streetcar Project Alternative is not expected to contribute to this demand, but would provide improved access to the park and recreation areas.

Mitigation. No mitigation is required.

Determination. The proposed project's potential to contribute considerably to cumulative impacts on recreation facilities and parklands is less than significant.

4.4 Public Services

4.4.1 Study Methods and Significance Criteria

An adverse impact on public services would occur if the proposed project would produce substantial adverse physical impacts associated with the need for or provision of new or physically altered public service facilities, to maintain acceptable service ratios, response times, or other performance objectives for public services, including fire protection, emergency medical treatment, police protection, schools, or libraries.

4.4.2 Impact Analysis

4.4.2.1 No-Project Alternative

Implementation of the No-Project Alternative would not directly affect physical access to fire protection, emergency medical, police, school and library facilities, because these facilities are located outside the study area. However, the response times for fire protection, emergency medical, and police services may be affected by the planned residential, commercial, and civic development in West Sacramento's redevelopment areas and downtown Sacramento, which is expected to generate additional demand on local roadways, a potentially significant impact.

A list of planned development projects used in this analysis is presented in Table 4-1.

4.4.2.2 Streetcar Project Alternative

Construction Impact Analysis

Impact PS-1: Potential to disrupt or constrain access to public services and facilities.

Construction of the Streetcar Project Alternative would occur within the existing public right-of-way between the West Sacramento Civic Center and 15th Street in downtown Sacramento, except for existing RT tracks and platforms that would be used between 7th Street and 12th Street in downtown Sacramento. This would include constructing new track, platforms, and pedestrian crosswalks; realignment of some curbs; and resurfacing roadways. Direct physical access to fire protection, emergency medical, police, school, and library facilities would not be affected by project construction since they are located outside the study area. As indicated in Section 4.5.2.2, the project sponsor will develop a Construction Traffic and Parking Management Plan that will ensure acceptable operating conditions on local roadways are maintained during project construction.

Mitigation. No mitigation is required.

Determination. Construction activities would not cause significant impacts on access to fire protection, emergency medical, police, school, and library facilities. Therefore, public service impacts associated with the Streetcar Project Alternative would be less than significant.

4.4.2.3 Operation Impact Analysis

Fire Protection and Emergency Medical Services

Impact PS-2: Potential to require additional public services facilities, equipment, or personnel to maintain existing service levels.

Streetcar station platforms are designed and constructed from nonflammable construction materials. For this reason, it is unlikely that fires would occur at the streetcar platforms, and the hiring of additional fire protection personnel would not be necessary. EMS may be required on streetcars and at streetcar platforms. However, these services are adequately provided in the study area and the occasional need for such services is not expected to significantly affect service delivery or response time. No impact is expected.

Police Protection

It is expected that police protection services may occasionally be required on streetcars and at streetcar stations. However, it is expected that this increase in demand for police protection services would be negligible and would not result in the need for significant expanded services because the WSPD and the SPD adequately serve the study area and are able to respond within minutes. Therefore, no impact is anticipated.

School Services

The Streetcar Project Alternative is not expected to result in significant impacts to school services because it would not directly or indirectly induce substantial population growth (see Section 4.2, Population and Housing). The WUSD and the SCUSD have adequate capacity to accommodate additional students (see Section 3.4, Public Services).

Library Services

The Streetcar Project Alternative is not expected to result in adverse impacts to library services because the proposed project would not directly or indirectly induce substantial population growth (see Section 4.2, Population and Housing), and, therefore, would not result in a significant increase in library usage in Sacramento or West Sacramento.

Mitigation. No mitigation is required.

Determination. Operation of the Streetcar Project Alternative is not expected to result in significant impacts to fire protection, emergency medical, police, school, or library services. The establishment of streetcar service between the West Sacramento Civic Center and downtown Sacramento may better provide for planned growth by improving circulation and access in the study area.

4.4.2.4 Cumulative Impact Analysis

Operation of the Streetcar Project Alternative is not expected to result in significant impacts to fire protection, emergency medical, school, or library services. Although planned development occurring simultaneously in the study area may require additional public services and facilities, it is not expected that the proposed project would contribute to considerable cumulative impacts on public services by requiring a substantial need for these services (see Table 4-1).

4.5 Transportation

This section identifies and evaluates the potential environmental impacts of the No-Project and Streetcar Project Alternatives in terms of transit, traffic, parking, railroad, bicycle, and pedestrian circulation in the study area.

4.5.1 Transit

This section discusses potential impacts on transit operations.

4.5.1.1 Study Methods and Significance Criteria

Project-related transit impacts were defined as those that would disrupt existing transit service, decrease existing ridership, or produce transit load factors over standard. In response to CEQA Significance Criteria, the alternatives were also examined to determine if they would conflict with adopted policies, plans, or programs supporting alternative (non-vehicular) transportation.

4.5.1.2 Transit Impact Analysis

No-Project Alternative

Under the No-Project Alternative, the proposed project would not be constructed and existing transit services would remain in their present state with no changes other than improvements that have been programmed and funded through 2012.

YCTD does not anticipate any of its bus lines would exceed their maximum capacity load factors under the No-Project Alternative and believes existing transit services would provide sufficient capacity to meet ridership demand into 2012 (Reitz, 2008a). RT anticipates expanded ridership in the study area would be met with planned expansions of light rail service. Additional RT service could be provided through expanded bus service or new rubber-tire shuttle services to meet any increase in demand (Lonergan, 2008).

For information on existing transit service and planned improvements under the No-Project Alternative, see the No-Project Alternative project description in Chapter 2 and the Transit section in Chapter 3.

Streetcar Project Alternative

Construction Impacts

Impact T-1: Potential to disrupt transit services resulting from proposed project construction activities.

The proposed streetcar tracks would be installed on multi-lane streets where there are typically two travel lanes available in each direction. Construction activities would require the temporary closure of one or perhaps both lanes in each direction, particularly if equipment and building materials were temporarily stored in the street as sections of old roadway were removed. On three-lane roadways, such as J Street, 15th Street, and L Street, at least one lane would remain open for traffic circulation at all times. Temporary lane closures would occur during a 3-week period over segments extending for three city blocks. Lane closures may require temporary rerouting of RT and Yobus routes, a potentially significant impact.

Mitigation. The construction contractor would coordinate construction activities with RT and Yobus and work with transit operators to communicate route detours to the riding public on a line-by-line basis (Hecht, 2008a).

Determination. Construction impacts on transit would be temporary. Mitigation would reduce these impacts to a less than significant level.

Operational and Cumulative Impacts

Impact T-2: Potential to affect ridership on RT and Yolobus routes.

Under the Streetcar Project Alternative, ridership projections were calculated using modified growth pattern and trip generation calculations based on the SACOG’s SACMET Sacramento Regional Travel Demand Model for the base year (2005) and for future year 2032.

With the implementation of streetcar service, existing competing bus service within the corridor was assumed to be truncated so that all bus riders within the corridor would transfer between the bus and streetcar to complete their trips (Roy, 2008a). The following YCTD and RT bus services would be truncated to complement the streetcar service:

- Yolobus 40 line, 41 line, and 42 line at the West Sacramento City Hall station; and
- RT 140 line, 143 line, 11 line, 36 line, 38 line, and 62 line at the point they intersect the streetcar alignment in Sacramento.

Projections were based on an analysis of streetcar ridership sensitivity to various fare structures for 2010 and 2030. As noted in Table 4-2, it was assumed that under the most likely operating scenario (10 minute peak and 15 minute off-peak headways, \$0.50 fare, and complementary bus service), the number of average weekday (non-event) riders traveling on the streetcar would increase from 7,700 to 10,800 between 2010 and 2030, respectively, or a 2 percent annual growth in transit trips. Of the total weekday riders, the number of new transit riders would increase from 2,400 in 2010 to 2,900 riders in 2030. Most of the new riders would be choice riders, those who choose to use transit rather than driving their cars (Roy, 2008b). This increase in new transit riders would be considered a beneficial impact of the proposed project.

Table 4-2. Streetcar Ridership Sensitivity to Fare Structure, Competing versus Complementary Bus Service

Fare Structure	Year 2010		Year 2030	
	Competing Bus Service	Complementary Bus Service	Competing Bus Service	Complementary Bus Service
\$0.00	6,100	8,300	9,000	11,700
\$0.25	5,700	8,000	8,400	11,300
\$0.50	5,300	7,700	7,900	10,800
\$0.75	4,900	7,400	7,400	10,400
\$1.00	4,600	7,100	6,900	10,000
\$1.25	4,300	6,800	6,400	9,600
\$1.50	4,000	6,600	6,000	9,300

Note: It is assumed the most likely operating scenario is \$0.50 fare structure.
 Source: HDR, 2007b.

Determination. No impacts on transit ridership would occur.

Impact T-3: Potential to affect transit travel times.

It is important to note that transit ridership is often sensitive to the need to transfer between vehicles or modes. For trips that would require transfers under this alternative, timed transfers between bus and streetcar modes would be scheduled whenever possible. Proper scheduling would prevent travel time impacts for riders in the corridor.

Mitigation. No mitigation is required.

Determination. No impacts on transit travel times would occur.

Impact T-4: Potential to affect transit load factors.

The total daily capacity is assumed to be 13,376 riders per day past any one point on the line if the representative historic cars are used, or 21,280 riders per day if the representative modern streetcars are used. To understand if sufficient capacity is being planned for the system for this level of ridership, load factors are calculated. Table 4-3 shows the assumptions used to calculate load factors by hourly averages. First, assumptions are made about the percentage of total riders that would ride within each time period, and thus within each hour. Then, an assumption is made that 50 percent of the riders in any one-time period would be on board at the maximum load point (location with greatest number of riders on board). Next, the capacity of the line per hour is determined. The load factor is the result of dividing the capacity by the estimated load. This analysis shows that, for both representative streetcar types, there is ample capacity with the planned headways for the ridership anticipated. Hourly load factors range from 15 percent to 65 percent for the historic streetcar and from 9 percent to 41 percent for modern streetcars.

Mitigation. No mitigation is required.

Determination. No significant impacts to transit operation would occur due to implementation of the proposed project.

Table 4-3. System Load Factors by Representative Vehicle Type

Hours of Operation	Estimated % of total ridership per hour ¹	Estimated total riders per hour	Assumed total number of riders at MLP per hour ²	Historic Streetcar ³		Modern Streetcar ⁴	
				Capacity per hour at MLP	Load Factor (%)	Capacity per hour at MLP	Load Factor (%)
6 a.m. – 7 a.m.	2.0%	222	111	704	15.8%	1,120	9.9%
7 a.m. – 9 a.m.	7.5%	833	416	704	59.1%	1,120	37.2%
9 a.m. – 12 Noon	3.0%	333	167	704	23.7%	1,120	14.9%
12 Noon – 2 p.m.	12.5%	1,388	694	1,056	65.7%	1,680	41.3%
2 p.m. – 4 p.m.	5.0%	555	278	704	39.4%	1,120	24.8%
4 p.m. – 6 p.m.	7.5%	833	416	704	59.1%	1,120	37.2%
6 p.m. – Midnight	4.0%	444	222	704	31.5%	1,120	19.8%

Notes:

- 1 Total daily ridership is assumed to be 11,100 passengers, as forecasted by the Travel Demand Analysis (Phase 1).
- 2 The average trip length is assumed to be 4 to 6 blocks, as noted on page 11 of the proposed project’s Phase 1 Summary Report (May 2007). Due to rider turnover, when each trip hits the maximum load point on the line (the location of which would be determined in future origin and destination studies), it is assumed that approximately 50 percent of the riders for each trip would be in the streetcar at that point.
- 3 Total capacity for historic (e.g., vintage) streetcars is 88 passengers.
- 4 Total capacity for modern streetcars (e.g., Inekon-type vehicle) is 140 passengers.

4.5.2 Traffic

4.5.2.1 Study Methods and Significance Criteria

This section analyzes the transportation system under interim year (2020) conditions, with and without the proposed project. The 2020 analysis considers the planned roadway improvements and land use projects near the proposed alignment.

Travel Demand Forecasting

To determine the background traffic levels under 2020 conditions, the SACOG SACMET regional travel demand forecasting model was used. The SACMET model has a horizon year of 2035 (which corresponds to the recently adopted 2035 MTP), and 2020 traffic volume forecasts were developed through a linear interpolation of the base year (2005) and 2035 versions of the model. This section briefly describes how the SACMET model was modified for use in this analysis.

To improve the forecasting ability of the SACMET model for local applications, a sub-area validation was performed. In a sub-area validation, the 2005 base year model volumes are compared to traffic counts and model parameters are adjusted to improve the performance of the model so it more closely replicates existing counts. In this case, the base year SACMET model was compared against daily traffic counts on the U.S. 50 Pioneer Bridge, the Tower Bridge, and the I Street Bridge, as well as a.m. and p.m. peak hour counts along Capitol Mall, L Street, and J Street. Adjustments were made to the modeled traffic volumes to compare with daily and peak hour traffic counts.

Based on the results of the 2005 base year model sub-area validation tests, the future year model was also modified to reflect a lower speed on Tower Bridge Gateway/Capitol Mall. In addition, the model roadway network and land use files were checked for reasonableness. SACOG's programmed transportation improvements and regional land use forecasts consistent with the 2035 MTP were employed in the base year and the future year versions of the model run.

Significance Thresholds

The proposed project is also subject to the significance criteria described in Traffic Impact Analysis Guidelines (City of Sacramento, 1996) and Traffic Impact Analysis Guidelines (City of West Sacramento, 1994). This section defines when a streetcar-related impact is significant.

The *City of West Sacramento General Plan, 2004* defines the City's LOS standard as LOS C, except at intersections and on roadway segments within ¼ mile of a freeway interchange or bridge crossing the Deep Water Ship Channel, barge canal, or Sacramento River, where LOS D is acceptable. For all facility types, an impact is considered significant if implementing the proposed project would:

- Deteriorate an acceptable LOS to an unacceptable LOS;
- Add more than 0.05 to the v/c ratio at an intersection that already operates at an unacceptable LOS without the proposed project; or
- Increase average driver delay by more than 5 seconds at an intersection that already operates at an unacceptable LOS without the proposed project.

The City of Sacramento General Plan defines the City's intersection LOS standard as LOS C. However, the City of Sacramento's General Plan Update is considering alternative LOS policies that would potentially allow lower LOS standards (i.e., LOS E) for intersections in the central city and within a certain distance of LRT stations. For the purposes of this study, impacts are reported in relation to the adopted General Plan LOS threshold (i.e., LOS C). For study intersections under the jurisdiction of the City of Sacramento, the proposed project would cause a significant impact if it were to:

- Decrease the level of service from LOS C or better to LOS D or worse; or
- Increase the average delay by five or more seconds at an intersection already operating (or projected to operate) at an unacceptable level.

4.5.2.2 Impact Analysis

No-Project Alternative

2020 Intersection Operations Analysis

Using the 2020 a.m. and p.m. peak hour traffic volume forecasts from the SACMET travel demand forecasting model, intersection operations were analyzed using the VISSIM microsimulation model developed for the existing conditions analysis.

In addition to the roadway modifications mentioned in the previous section, several changes to intersection geometries were assumed under 2020 conditions:

- The ramp between L Street and westbound Capitol Mall would be closed; and
- A new eastbound left turn lane would be constructed at Capitol Mall/4th Street, providing access to the CALPERS site.

It was also assumed that signal-timing plans would be updated to better serve the increased traffic under 2020 conditions. However, no changes were assumed for signal phasing or signal control (i.e., it was not assumed that pre-timed signals would be converted to actuated signals).

Figure 4-1 presents the 2020 a.m. and p.m. peak hour turning movement forecasts and lane configurations for the study intersections. Table 4-4 presents the LOS results for the study intersections under 2020 No-Project conditions.

The results in Table 4-4 indicate that increased development in downtown West Sacramento and Sacramento, combined with the rather modest increase in roadway capacity, produces less than acceptable service levels in the a.m. and/or p.m. peak hour under the No-Project Alternative. In particular, the results show heavy congestion on Tower Bridge Gateway/Capitol Mall between 3rd Street in West Sacramento and 3rd Street in Sacramento during the a.m. and p.m. peak hours. In reviewing the VISSIM simulation models, the delay at these intersections is seen to be largely a result of the heavy eastbound right turn movement at Capitol Mall/3rd Street. This heavy movement cannot be served with the shared through/right turn lane, and queues develop that extend beyond 3rd Street in West Sacramento, an unavoidable impact.

Table 4-4. Intersection Level of Service - 2020 No-Project Conditions

Intersection	Traffic Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay ¹	LOS	Delay ¹	LOS
Tower Bridge Gateway/3rd Street	Traffic Signal	81 ²	F ²	206 ²	F ²
Capitol Mall/Front Street	Traffic Signal	81 ²	F ²	83 ²	F ²
Capitol Mall/3rd Street	Traffic Signal	46	D	56	E
Capitol Mall/7th Street	Traffic Signal	18	B	23	C
Capitol Mall/8th Street	Traffic Signal	19	B	18	B
K Street/12th Street	Traffic Signal	18	B	16	B
J Street/13th Street	Traffic Signal	14	B	74	E
J Street/14th Street	Traffic Signal	7	A	31	C
J Street/15th Street	Traffic Signal	14	B	28	C
K Street/15th Street	Traffic Signal	9	A	17	B
L Street/15th Street	Traffic Signal	11	B	24	C

Notes:

¹ The average control delay reported for signalized intersections is for all vehicles passing through the intersection.

² Long delays and poor LOS at this intersection are largely caused by queues extending from the Capitol Mall/3rd Street intersection.

Shaded areas indicate unacceptable operations per the West Sacramento and Sacramento General Plan LOS policies.

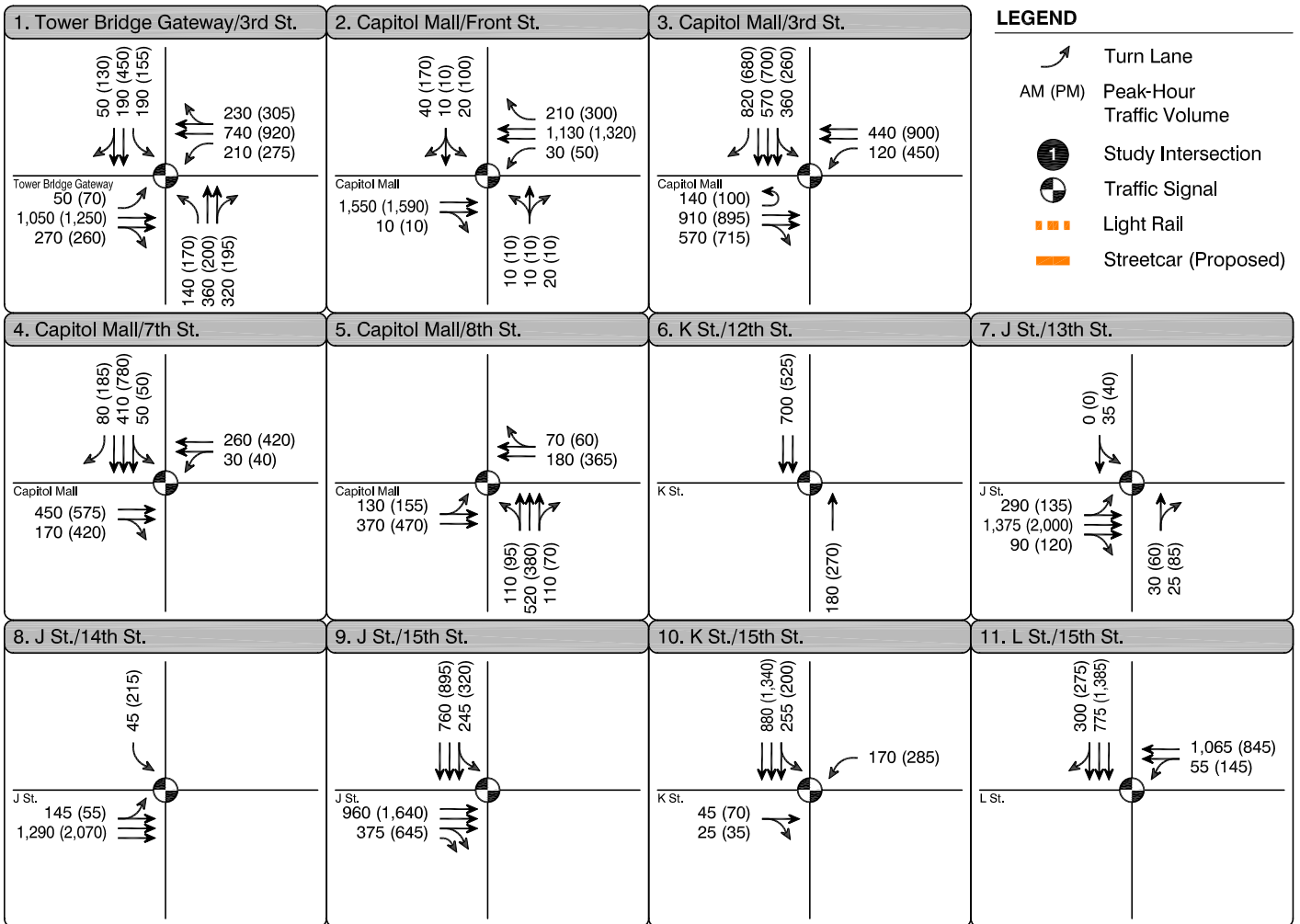
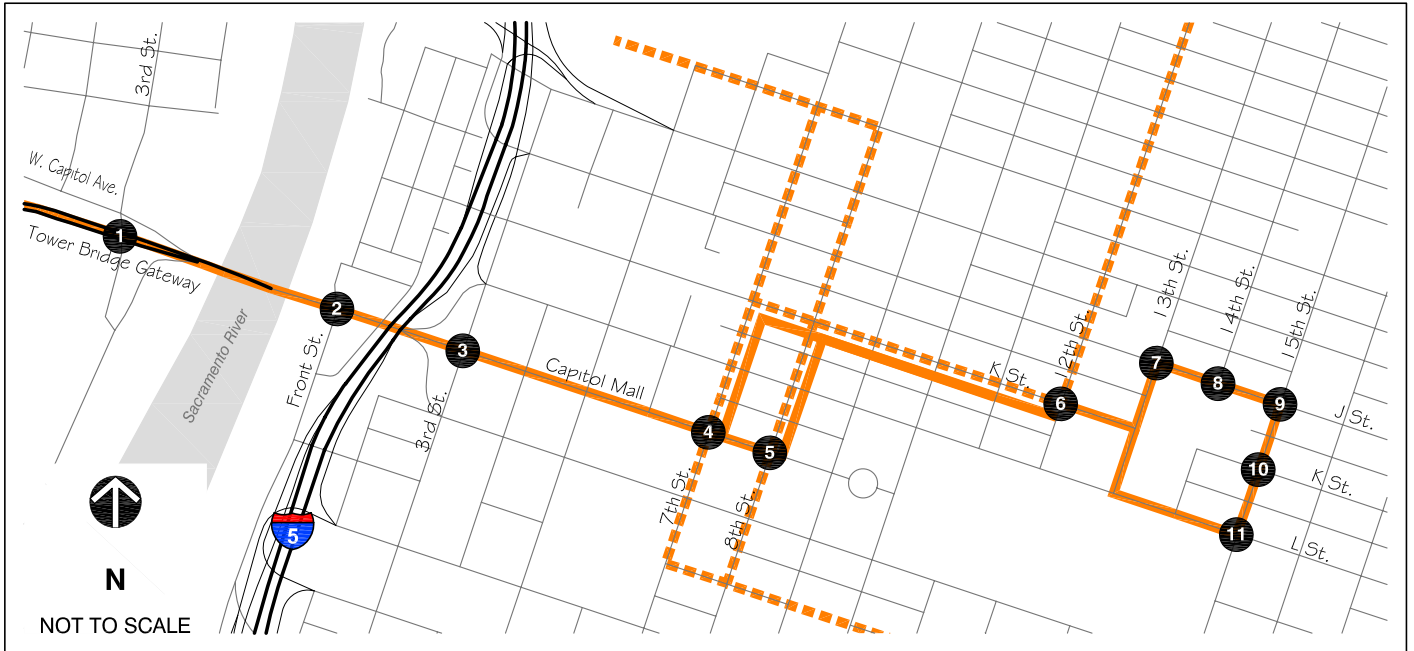
Source: Fehr & Peers, 2008.

The results also indicate that the J Street and 13th Street intersection is heavily congested in the p.m. peak hour. The VISSIM simulation shows substantial queues in the eastbound direction at 13th Street, similar to existing conditions when there are events at the Convention Center and Sheraton Hotel, a significant impact. By 2020, the No-Project Alternative would create significant and unavoidable impacts at several intersections in the study area.

2035 Intersection Operations Analysis

Using the 2035 a.m. and p.m. peak hour traffic volume forecasts from the SACMET travel demand forecasting model, intersection operations were analyzed using the VISSIM microsimulation model developed for the 2020 No-Project conditions analysis. The VISSIM model was updated to include the 2035 peak hour traffic volumes, and the intersection timings were optimized to better accommodate 2035 traffic volumes.

Figure 4-2 presents the 2035 a.m. and p.m. peak hour turning movement forecasts and lane configurations for the study intersections. Table 4-5 presents the LOS results for the study intersections under 2035 No-Project conditions. As shown in Table 4-5, the proposed development in West Sacramento and downtown Sacramento contributes to significant congestion in both the a.m. and p.m. peak hours. Congestion is particularly pronounced around the Tower Bridge in the a.m. peak hour. During the p.m. peak hour, the VISSIM simulation shows gridlocked conditions on Tower Bridge Gateway/Capitol Mall, and heavy congestion on J Street. These intersections would operate at substandard conditions, a significant impact. By 2035, the No-Project Alternative would create additional significant and unavoidable impacts at several intersections in the study area.



Source: Fehr & Peers Transportation Consultants, 2008.

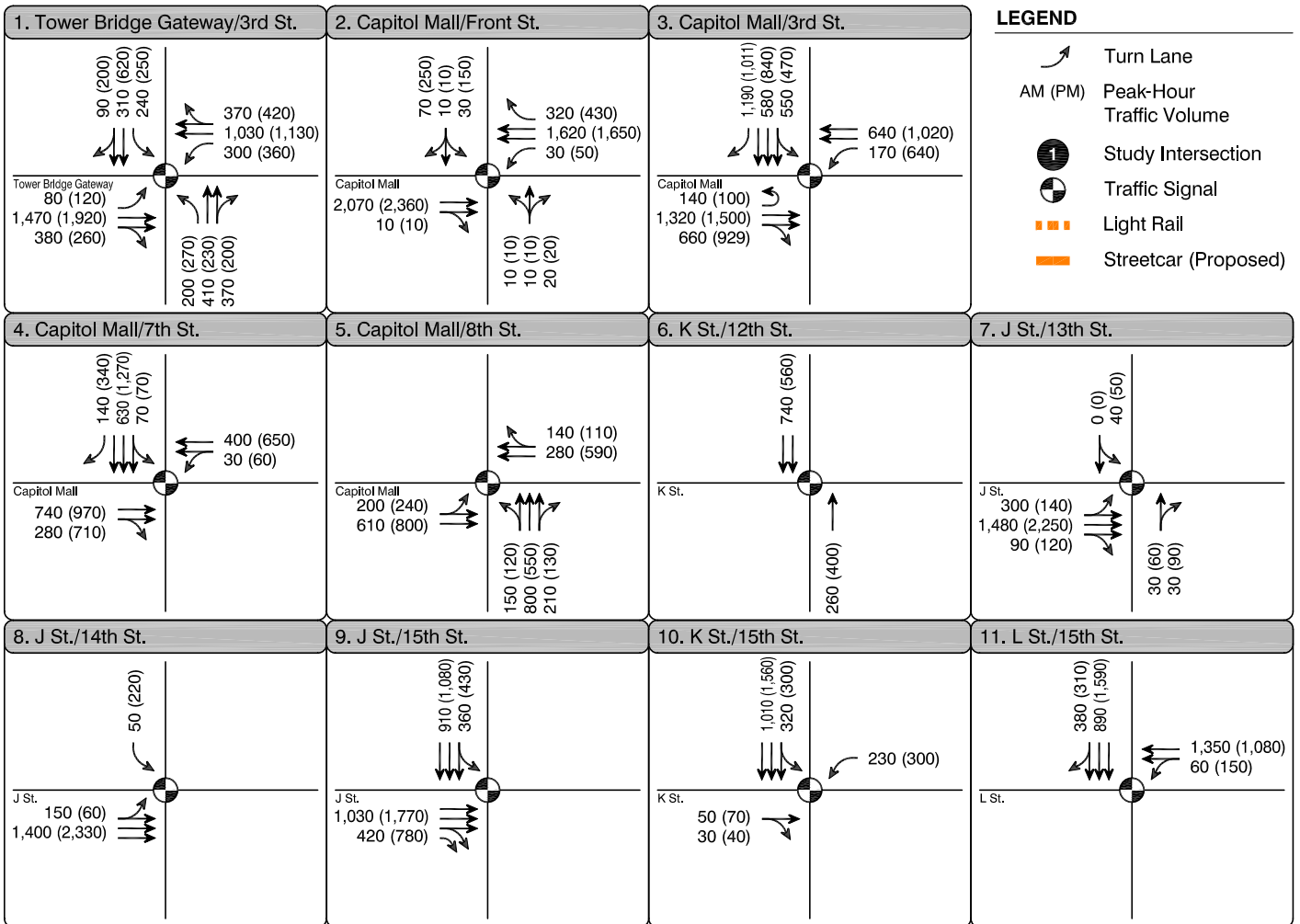
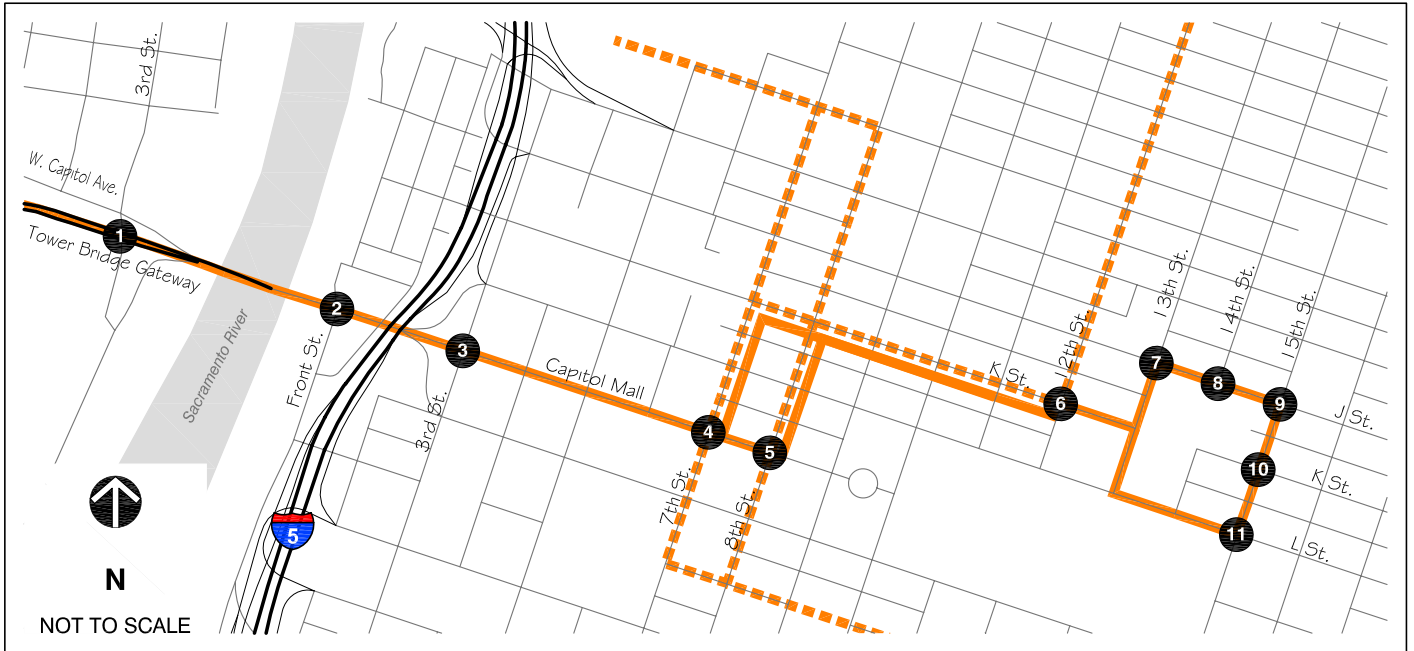
PEAK-HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2020 NO-PROJECT CONDITIONS

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California



FIGURE 4-1



Source: Fehr & Peers Transportation Consultants, 2008.

PEAK-HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE NO-PROJECT CONDITIONS

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California



FIGURE 4-2

Table 4-5. Intersection Level of Service - 2035 No-Project Conditions

Intersection	Traffic Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay1	LOS	Delay1	LOS
Tower Bridge Gateway/3rd Street	Traffic Signal	2912	F ²	3442	F ²
Capitol Mall/Front Street	Traffic Signal	1552	F ²	1652	F ²
Capitol Mall/3rd Street	Traffic Signal	174	F	144	F
Capitol Mall/7th Street	Traffic Signal	26	C	2802	F
Capitol Mall/8th Street	Traffic Signal	37	D	2692	F
K Street/12th Street	Traffic Signal	19	B	19	B
J Street/13th Street	Traffic Signal	19	B	107	F
J Street/14th Street	Traffic Signal	12	B	41	D
J Street/15th Street	Traffic Signal	21	C	61	E
K Street/15th Street	Traffic Signal	11	B	16	B
L Street/15th Street	Traffic Signal	18	B	19	B

Notes:

- 1 The average control delay reported for signalized intersections is for all vehicles passing through the intersection.
 - 2 Long delays and poor LOS at this intersection are largely caused by queues extending from the Capitol Mall/3rd Street intersection.
- Shaded areas indicate unacceptable operations per the West Sacramento and Sacramento General Plan LOS policies.
Source: Fehr & Peers, 2008.

Streetcar Project Alternative

Construction Impacts

Impact T-5: Potential to temporarily disrupt circulation in the study area.

Construction activities would include disruptions to the transportation network near the proposed project alignment, including the possibility of temporary lane closures, street closures, sidewalk closures, and bikeway closures. Pedestrian and transit access may also be disrupted. These activities could result in degraded transportation system conditions.

Mitigation. The project sponsor will develop a Construction Traffic and Parking Management Plan that will be subject to review and approval by the City of West Sacramento Traffic Engineer, the City of Sacramento Department of Transportation, Caltrans, and local emergency service providers including the fire and police departments. The plan will ensure that acceptable operating conditions on local roadways and freeway facilities are maintained during construction. At a minimum, the plan will include:

- The number of truck trips, time, and day of street closures;
- Time of day of arrival and departure of trucks;
- Limitations on the size and type of trucks, provision of a staging area with a limitation on the number of trucks that can be waiting;
- Provision of a truck circulation pattern;
- Provision of driveway access plan so that safe vehicular, pedestrian, and bicycle movements are maintained (e.g., steel plates, minimum distances of open trenches, and private vehicle pick up and drop off areas);

- Maintain safe and efficient access routes for emergency vehicles;
- Manual traffic control when necessary;
- Proper advance warning and posted signage concerning street closures; and
- Provisions for pedestrian safety.

A copy of the construction traffic management plan will be submitted to local emergency response agencies and these agencies will be notified at least 14 days before the commencement of construction that would partially or fully obstruct roadways.

Determination. By implementing the Construction Traffic and Parking Management Plan described above, the impacts of construction activities to the transportation system would be managed. Therefore, this impact is less than significant with mitigation.

Operations Impacts (2020)

Impact T-6: Potential to degrade intersection operation in 2020.

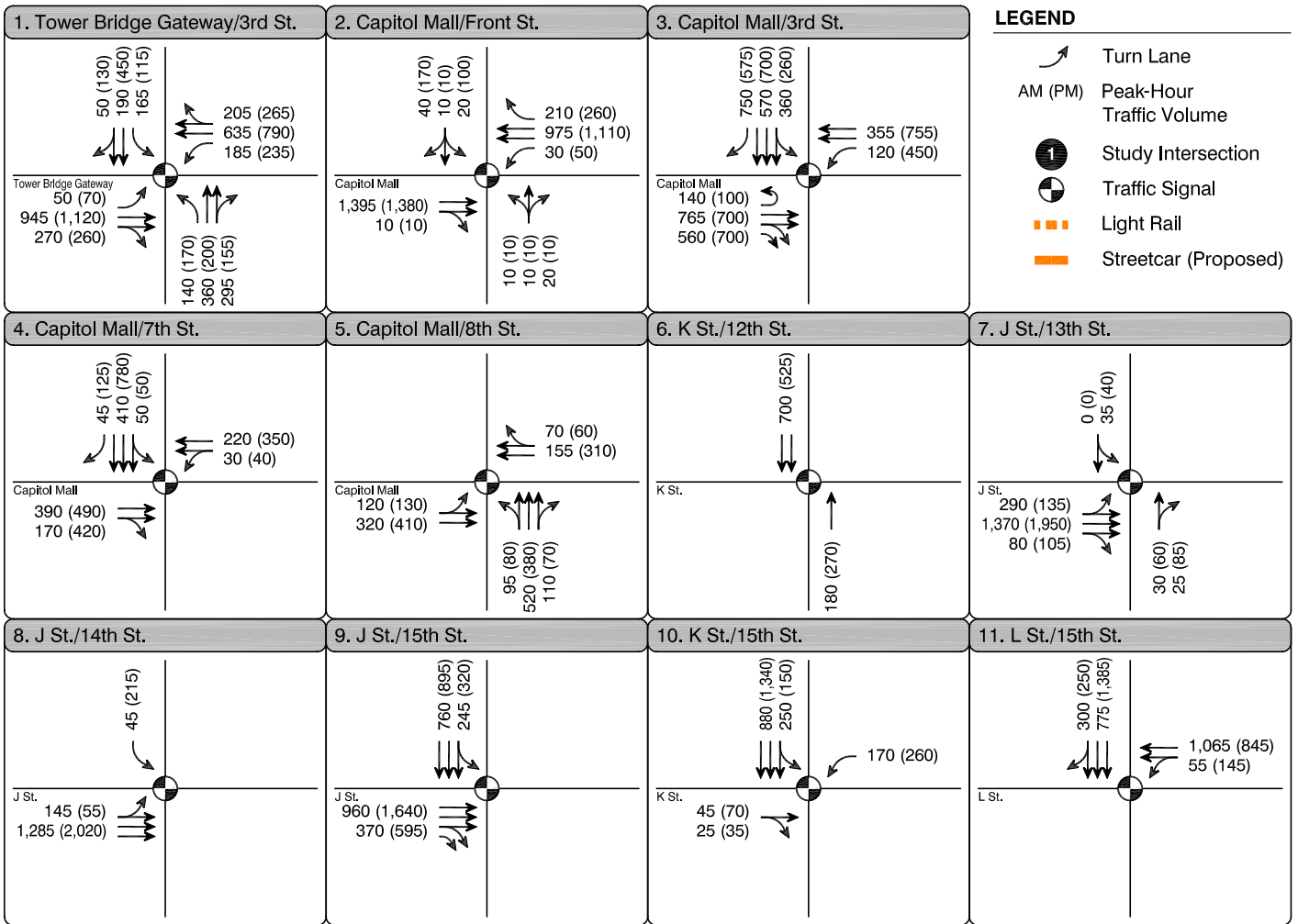
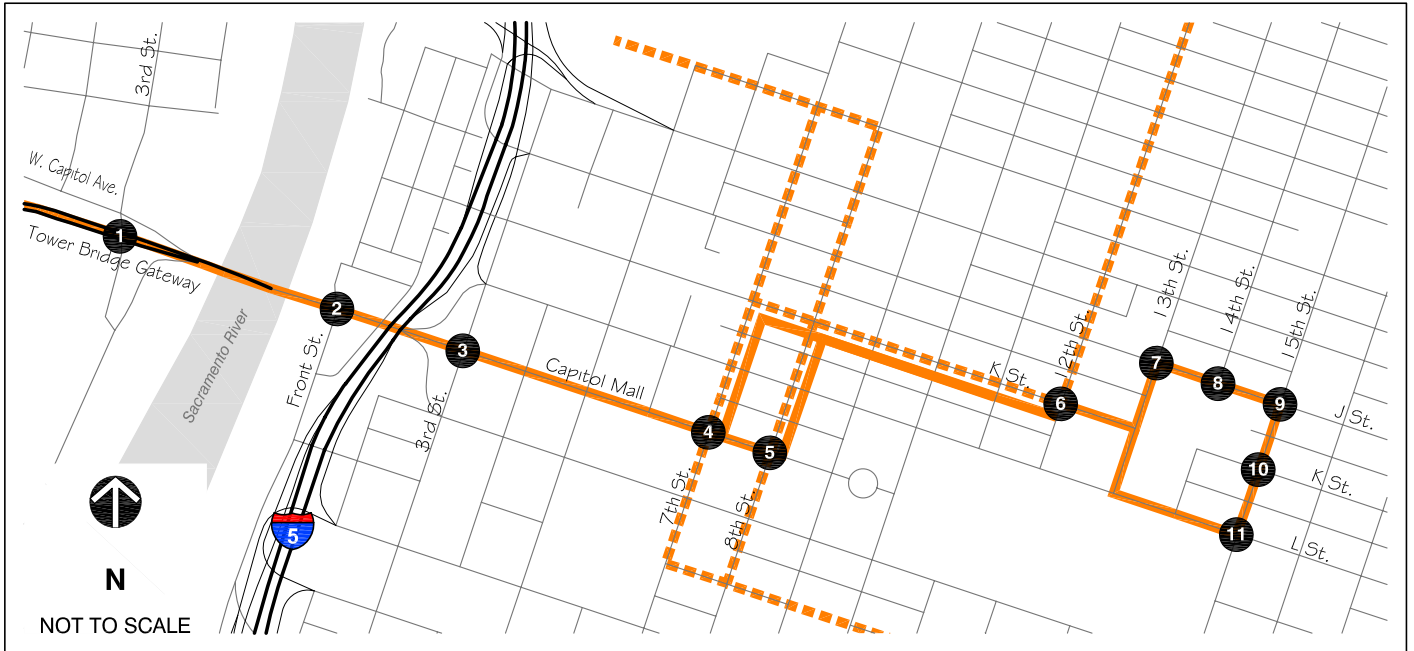
Many of the intersections along the streetcar alignment will have to be modified to accommodate the streetcar. Most of the modifications will be minor, in terms of the effects on traffic, bicycles, pedestrians, and other transit vehicles, and will involve moving streetlights, traffic signals, and limit lines. However, to improve intersection operations and limit delays to the streetcar, two intersections are proposed to have additional lanes added as part of the proposed project:

- A new exclusive eastbound right turn lane will be provided at Capitol Mall/3rd Street; and
- A new exclusive eastbound left turn lane provided at Capitol Mall/6th Street.

As part of these improvements, it is also assumed that the traffic signal controllers will be replaced with more modern units that allow for more efficient operation (i.e., actuated control as opposed to pretimed control).

The VISSIM traffic micro-simulation model was updated with the new traffic volumes, lane configurations, and signal-timing plans described above. Table 4-6 and Figure 4-3 summarize the results of the LOS analysis and compare the No-Project and Streetcar Project Alternatives.

Table 4-6 indicates that the proposed streetcar has a beneficial effect on roadway operations in the a.m. and p.m. peak hours. The largest benefit is related to the intersection improvements at Capitol Mall/3rd Street, where the additional right turn lanes reduce queuing substantially, which also translates to improved intersection operations at Tower Bridge Gateway/3rd Street and Capitol Mall/Front Street. Note that without this improvement, the streetcar would be significantly delayed between the Raley Field and Old Sacramento stations because of queuing across the Tower Bridge.



Source: Fehr & Peers Transportation Consultants, 2008.

PEAK-HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - 2020 PLUS PROJECT CONDITIONS

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California



FIGURE 4-3

Table 4-6. Intersection Level of Service - 2020 With Project Conditions

Intersection	A.M. Peak Hour				C.M Peak Hour			
	No-Project Alternative		Streetcar Project Alternative		No-Project Alternative		Streetcar Project Alternative	
	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS
Tower Bridge Gateway/3rd Street	81 ²	F ²	46	D	206 ²	F ²	55	D
Capitol Mall/Front Street	81 ²	F ²	17	B	83 ²	F ²	28	C
Capitol Mall/3rd Street	46	D	19	B	56	E	34	C
Capitol Mall/7th Street	18	B	19	B	23	C	28	C
Capitol Mall/8th Street	19	B	21	C	18	B	19	B
K Street/12th Street	18	B	21	C	16	B	21	C
J Street/13th Street	14	B	13	B	74	E	58	E
J Street/14th Street	7	A	7	A	31	C	29	C
J Street/15th Street	14	B	14	B	28	C	27	C
K Street/15th Street	9	A	11	B	17	B	17	B
L Street/15th Street	11	B	12	B	24	C	25	C

Notes:

¹ The average control delay reported for signalized intersections is for all vehicles passing through the intersection.

² Long delays and poor LOS at this intersection are largely caused by queues extending from the Capitol Mall/3rd Street intersection.

Shaded areas indicate unacceptable operations per the West Sacramento and Sacramento General Plan LOS policies.

Source: Fehr & Peers, 2008.

The analysis also indicates that the single-track configuration of the streetcar on Tower Bridge would operate acceptably through 2020. The only location operating at an unacceptable LOS under 2020 with proposed project conditions is the J Street/13th Street intersection during the p.m. peak hour. While this intersection operates at an unacceptable LOS E, the poor intersection operations are not a result of streetcar operation. The proposed project decreases delay at this intersection by reducing the number of p.m. peak hour auto trips.

Mitigation. No intersection mitigation is required.

Determination. The results in Table 4-6 show that the proposed project would cause no impacts to intersection operations under 2020 conditions. The proposed streetcar would have a beneficial effect on roadway operations in the a.m. and p.m. peak hours, particularly at Capitol Mall/3rd Street.

Cumulative Impacts (2035)

Impact T-7: Potential to degrade intersection operation in 2035.

This section analyzes the transportation system under cumulative year (2035) conditions, with and without the proposed project. The analysis is based on the travel demand forecasting and ridership forecasting discussed in the Study Methodology above.

Figure 4-4 presents turning movement forecasts and lane configurations for the study intersections for the 2035 with proposed project a.m. and p.m. peak hours. Table 4-7 presents the LOS results.

The results in Table 4-7 indicate that the proposed streetcar has a beneficial impact on roadway operations in the a.m. and p.m. peak hours. As is the case under 2020 conditions, the largest benefit would be related to the intersection improvements at Capitol Mall/3rd Street, where the additional right turn lane substantially reduces queuing. The beneficial impact at Capitol Mall/3rd Street is particularly pronounced in the p.m. peak hour, and intersection operations on the corridor improve along the entire length between 3rd Street in West Sacramento and 8th Street in Sacramento. The results also indicate that more vehicles would travel through the study area with the proposed project in place, and overall congestion levels would be lower than under No-Project conditions.

Table 4-7. Intersection Level of Service - 2035 With Project Conditions

Intersection	A.M. Peak Hour				P.M. Peak Hour			
	No-Project Alternative		Streetcar Project Alternative		No-Project Alternative		Streetcar Project Alternative	
	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS	Delay ¹	LOS
Tower Bridge Gateway/ 3rd Street	291 ²	F ²	222	F	344 ²	F ²	323	F
Capitol Mall/Front Street	155 ²	F ²	61	E	165 ²	F ²	80	F
Capitol Mall/3rd Street	174	F	133	F	144	F	129	F
Capitol Mall/7th Street	26	C	27	C	280	F	157	F
Capitol Mall/8th Street	37	D	39	D	269	F	42	D
K Street/12th Street	19	B	24	C	19	B	22	C
J Street/13th Street	19	B	16	B	107	F	110	F
J Street/14th Street	12	B	11	B	41	D	45	D
J Street/15th Street	21	C	22	C	61	E	61	E
K Street/15th Street	11	B	12	B	16	B	17	B
L Street/15th Street	18	B	17	B	19	B	22	C

Notes:

¹ The average control delay reported for signalized intersections is for all vehicles passing through the intersection.

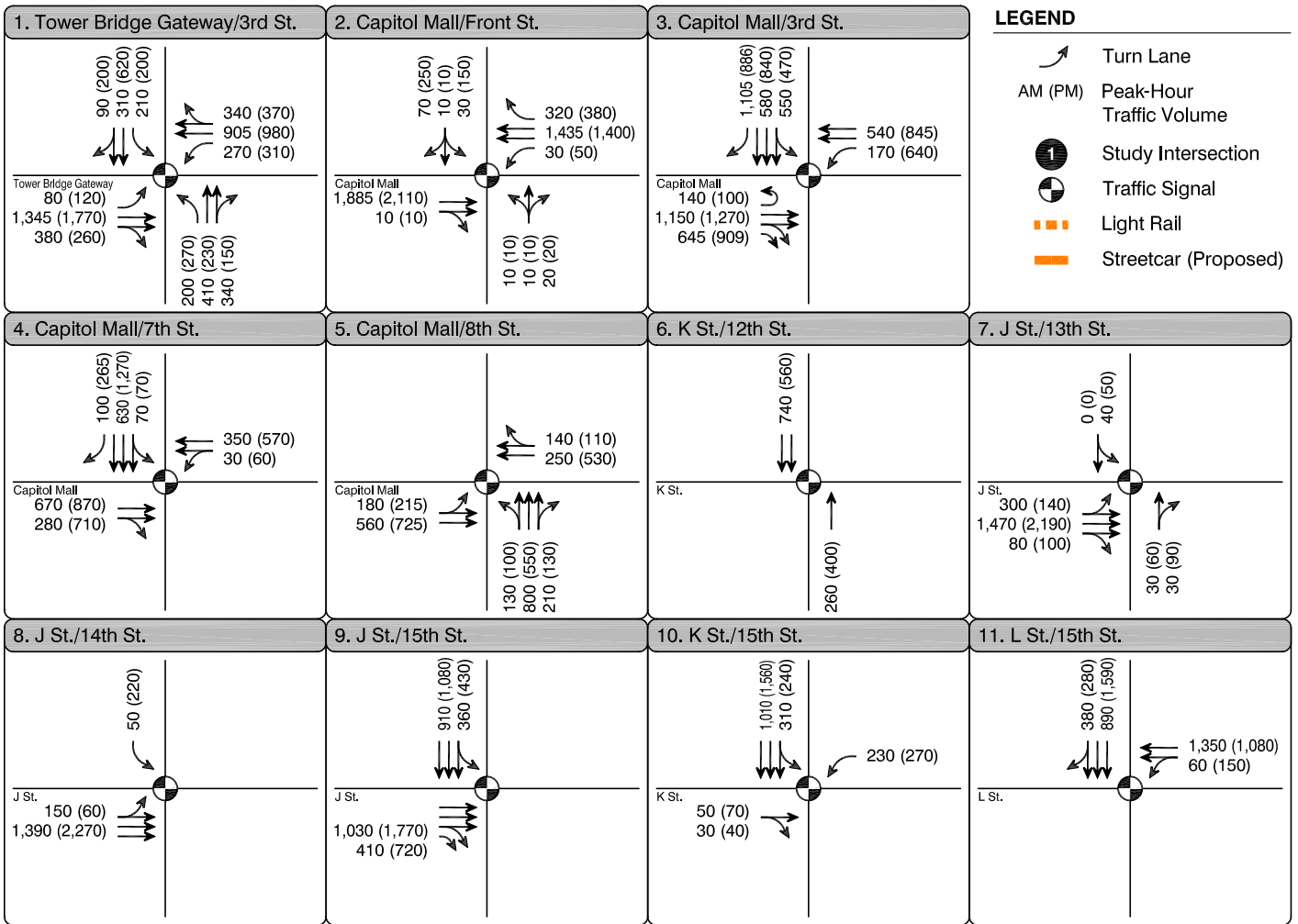
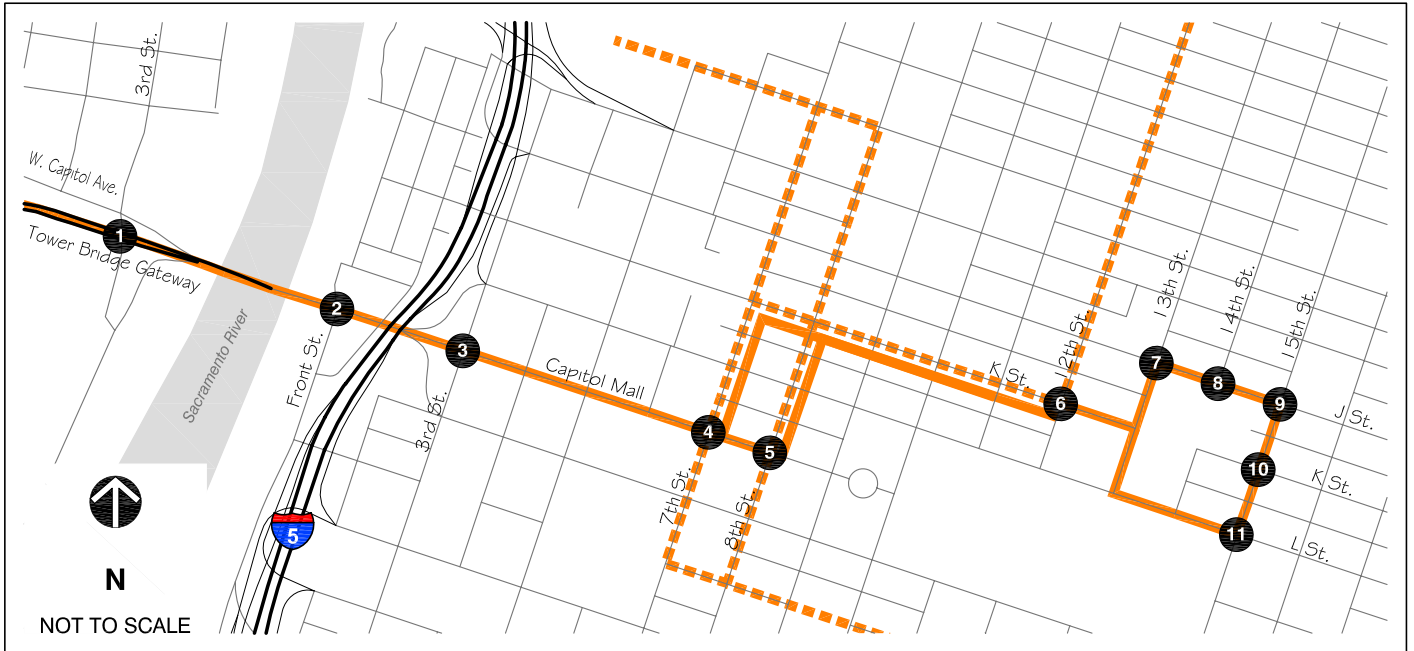
² Long delays and poor LOS at this intersection are largely caused by queues extending from the Capitol Mall/3rd Street intersection.

Shaded areas indicate unacceptable operations per the West Sacramento and Sacramento General Plan LOS policies.

Source: Fehr & Peers, 2008.

By 2035, additional growth under cumulative conditions will lead to significant congestion. The Capitol Mall/Tower Bridge Gateway corridor is particularly affected by the additional growth. While the results in Table 4-7 indicate that many of the intersections are expected to operate at an unacceptable level under 2035 No-Project conditions, the proposed project neither causes an intersection to degrade to unacceptable operations, nor does it increase delay by five or more seconds (the local significance criteria).

While the proposed project would not create any potentially significant impacts, the level of congestion that would occur on the approaches to the Tower Bridge between 2020 and 2035 horizon years may be partially attributable to the single-track configuration of the streetcar



Source: Fehr & Peers Transportation Consultants, 2008.

PEAK-HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - CUMULATIVE PLUS PROJECT CONDITIONS

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California



FIGURE 4-4

across the bridge. Alternative streetcar configurations across the Sacramento River, such as the provision of a double track configuration (e.g., with tracks centered in both the eastbound and westbound #1 lanes), may need to be evaluated and considered in the future.

Mitigation. None is required.

Determination. The proposed project would not contribute to intersections operating at unacceptable levels in future conditions. The streetcar is expected to divert some car trips to transit, thereby slightly reducing congestion, a beneficial effect.

4.5.3 Parking

4.5.3.1 Study Methods and Significance Criteria

An assessment of the proposed project's effect on parking capacity was performed. A substantial reduction in parking availability in the study area resulting from implementation or cumulative effects of the proposed project plus other development projects in the study area would be considered significant.

4.5.3.2 Parking Impact Analysis

No-Project Alternative

Under the No-Project Alternative, on-street parking and public parking would remain as is. Other development projects that could contribute to a reduced number of overall parking spaces in the study area would be responsible for creating new parking in accordance with city criteria.

Streetcar Project Alternative

Construction, Operations, and Cumulative Impacts

Impact T-8: Potential to displace on-street parking.

As indicated in Section 3.5-2, curb parking is provided along three Sacramento streets where streetcar construction would occur: J Street (between 13th Street and 15th Streets), 15th Street (between J Street and L Street), and L Street (between 13th Street and 15th Street). The construction of the rail alignment on these one-way streets would be a single-track configuration in the traffic lane that is closest to the curb along the south side of J Street, east side of 15th Street, and north side of L Street. Because the alignment is confined to the traffic lane, the curb parking would be retained on J Street and L Street. However, on 15th Street between J Street and K Street, a station platform would be constructed that would abut the curb, displacing four parking spaces. These four spaces represent a small fraction of the approximately 49,000 parking spaces available in downtown Sacramento and, as such, would not significantly affect the overall parking capacity currently available (City of Sacramento, 2006). Similarly, if construction of downtown development projects simultaneously, but temporarily, displaced multiple public parking spaces, the removal of four spaces by the proposed project would not constitute a considerable cumulative effect on the overall parking supply.

Mitigation. No mitigation is required.

Determination. The few curb parking spaces displaced by construction and operation of the proposed project would not constitute a significant project-related or cumulative impact.

4.5.4 Railroad

4.5.4.1 Study Methods and Significance Criteria

CEQA Guidelines (Appendix G) do not include significance criteria that evaluate impacts on freight and passenger railroad operations. However, because the proposed project could affect existing freight rail lines that are adjacent to or cross the proposed alignment, an assessment of potential effects is warranted. For the purpose of this analysis, temporary or permanent disruption of service, use of the railroad right-of-way, or displacement of railroad facilities is considered a potentially significant impact that would require mitigation.

4.5.4.2 No-Project Alternative

Under the No-Project Alternative, existing railroad infrastructure would remain in the present state with no changes other than improvements that have been programmed and funded through 2012. For information on existing railroad conditions and railroad improvements, see Section 3.5.2.

4.5.4.3 Streetcar Project Alternative

Construction Impacts

Impact T-9: Potential to temporarily affect railroad operation due to project-related construction activities.

A segment of the existing rail of the Sacramento Southern Railroad would be altered by installing a crossing diamond where the streetcar alignment crosses the railroad. The construction activities would be coordinated with the Sacramento Southern Railroad so that operation of the excursion service, primarily in the summer, is not disrupted. Construction coordination would ensure that no significant railroad construction impacts would occur under the Streetcar Project Alternative (Hecht, 2008a).

Mitigation. No mitigation is required.

Determination. No project-related construction impacts would occur on railroads.

Operational and Cumulative Impacts

Impact T-10: Potential to conflict with railroad governing codes promulgated by the CPUC.

The existing UPRR railroad bridge over Tower Bridge Gateway has a vertical clearance that does not conform to CPUC General Order 95, which requires an 18-foot vertical clearance. The constrained vertical clearance would allow the overhead contact wire for the streetcar to be approximately 14 feet, 6 inches above street grade, insufficient to meet the CPUC standard.

Mitigation. To resolve the vertical clearance constraint beneath the existing UPRR overpass on Tower Bridge Gateway, a variance from the CPUC's Utility Safety Branch must be approved. Without the variance, the proposed project would be responsible for lowering the elevation of the street grade under the UPRR overpass to achieve the CPUC clearance standard. In this scenario, relocation of adjacent fiber-optic cables and installation of a storm drain pump station may be required (Hecht, 2008b).

Determination. With the aforementioned mitigation measures, the vertical clearance impact would be less than significant.

4.5.5 Bicycle Facilities

This section focuses on the potential environmental consequences related to bicycle facilities in the proposed project study area for each alternative.

4.5.5.1 No-Project Alternative

Under the No-Project Alternative, existing bicycle conditions would remain in their present state with no changes other than improvements that have been programmed and funded through 2012. These improvements would enhance bicycle circulation in the study area and would not negatively affect bicycle riders. For information on existing bicycle conditions and planned improvements, see Section 3.5.2.

4.5.5.2 Streetcar Project Alternative

Construction Impacts

Impact T-11: Potential to temporarily disrupt bicycle circulation during project construction.

Streetcar construction may temporarily disrupt bicycle circulation in roads along the streetcar alignment. This impact would most likely occur where the alignment is being constructed across or adjacent to an existing bicycle path, such as along the curbside of Tower Bridge Gateway or along the narrow 13th Street right-of-way between J Street and L Street.

Mitigation. Bicycle detours will be devised and publicized in advance of streetcar construction. Alternatively, it may be possible to route bicycles along short sidewalk segments, depending on the pedestrian volumes along the sidewalk (Hecht, 2008a).

Determination. With the above-mentioned mitigation, temporary impacts on bicycle circulation would be less than significant.

Operational and Cumulative Impacts

Impact T-12: Potential to displace or disrupt bicycle lane operation.

Along portions of the alignment, the typical placement of the streetcar track in the right lane allows for a standard-width bicycle lane between the gutter and track. In locations where the streetcar would stop alongside the curb, there would be insufficient space for a standard bicycle lane (i.e., Tower Bridge Gateway from Garden Street to 3rd Street in West Sacramento and 13th Street from L Street to J Street in Sacramento). To resolve this issue and prevent a significant impact on bicycle circulation, at each right lane streetcar stop, the bicycle lane would be routed behind the platform to accommodate continuous bicycle travel (Hecht, 2008a).

Along Tower Bridge, bicyclists would have the option of using the shared sidewalk/bicycle sidewalk or using an unofficial 4-foot bicycle lane that runs along the shoulder of the Tower Bridge. No significant impacts are anticipated to occur between the streetcar and bicyclists with the streetcar operating in the center of the bridge.

Mitigation. No mitigation is required.

Determination. No significant long-term bicycle circulation impacts would occur because of project operation.

4.5.6 Pedestrian Facilities

This section focuses on the potential environmental consequences related to pedestrian circulation in the study area for each alternative.

4.5.6.1 No-Project Alternative

Under the No-Project Alternative, existing pedestrian conditions would remain in their present state with no changes other than improvements that have been programmed and funded through 2012. The improvements would facilitate rather than impede pedestrian circulation. For information on existing pedestrian conditions and planned improvements, see Section 3.5.2.

4.5.6.2 Streetcar Project Alternative

Construction Impacts

Impact T-13: Potential to disrupt pedestrian circulation during project construction.

No significant construction impacts on pedestrian circulation would occur under the Streetcar Project Alternative. Even with temporary road closures occurring because of streetcar construction, it is possible that a sidewalk can be maintained, but this would need to be examined on a block-by-block basis (Hecht, 2008a).

Mitigation. No mitigation is required.

Determination. No significant construction-related pedestrian impacts would occur under the proposed project.

Operational and Cumulative Impacts

Impact T-14: Potential to permanently displace or disrupt pedestrian pathways.

Based on the low level of existing pedestrian volumes within the study area, streetcar operations would not produce long-term impacts on the pedestrian environment or contribute to cumulative pedestrian impacts.

Determination. No significant pedestrian impacts would occur under the proposed project.

4.5.7 Navigation

4.5.7.1 Study Methods and Significance Criteria

CEQA Guidelines (Appendix G) do not include significance criteria that evaluate impacts on river navigation. However, the proposed project crosses the Tower Bridge, which has a mechanism to raise and lower the bridge to allow high-clearance boats to pass under the bridge. If construction or operation of the proposed project were to limit or prevent the bridge from being raised or lowered, thereby restricting navigation, a significant impact would result.

4.5.7.2 Navigation Impact Analysis

No-Project Alternative

The No-Project Alternative would allow continued operation of the Tower Bridge lift, and boats could continue to navigate the Sacramento River without being impeded by the bridge.

*Streetcar Project Alternative***Construction Impacts****Impact T-15: Potential for construction activities to restrict use of the Tower Bridge lift.**

Construction of streetcar track, structural underpinning, and the catenary system on Tower Bridge could temporarily restrict use of the lift mechanism to raise and lower the bridge, a significant impact on navigation.

Mitigation. If construction activities limit or impede use of the lift mechanism of the bridge during intermittent or extended periods, the U.S. Coast Guard will be informed of these occurrences a minimum of 30 days in advance of the interruption to navigational traffic. The U.S. Coast Guard will post notice of the temporary closure in the Federal Register, and businesses and boat owners that would be most affected by the obstruction of navigation will be notified individually. The project sponsor will coordinate with Caltrans, the owner of the Tower Bridge, the U.S. Coast Guard, and affected businesses/boat owners to minimize or alleviate the potential impact by providing proper notification of the bridge closures; by scheduling closures in the non-peak excursion season (October through April); or by raising the bridge for an extended time to allow continuous river navigation, while temporarily rerouting vehicular and non-motorized traffic.

Determination. By applying the appropriate mitigation measures described above, continued navigation would be ensured and the impact would be less than significant.

*Operation and Cumulative Impacts***Impact T-16: Potential to permanently disrupt use of the Tower Bridge lift mechanism.**

Operation of the streetcar would not interfere with the bridge's lift mechanism nor create a navigational barrier to vessel traffic along the Sacramento River. No other projects are expected to occur simultaneously on Tower Bridge that would create cumulative impacts on bridge use or on navigation.

Mitigation: No mitigation is required.

Determination. No operational or cumulative impacts are expected on navigation.

4.6 Cultural Resources

4.6.1 Archaeological Resources Study Methods and Significance Criteria

4.6.1.1 Record Search and Literature Review

In October 2007, a preliminary record search was requested for the study area from the North Central Information Center of the California Historical Resources Information Systems at California State University Sacramento, which serves as the regional office for State Historic Preservation Office. The purpose of the record search was to identify any previously recorded cultural resources and/or cultural resource surveys in and/or within a 0.25-mile radius of the study area. The requested research included a review of ethnographic and historic literature and maps; federal, state, and local inventories of historic properties; archaeological base maps and site records; and survey report citations on file at the Information Center. A total of 15 archaeological sites and fifty-five cultural resource surveys were identified within 0.25 mile of the study area. This area has been extensively developed and studied. Reports are available on

file with the North Central Information Center of California Historical Resources Information Systems at California State University Sacramento.

As indicated in Section 3.6.2, the cultural resource impact analysis was conducted only on those properties and sites within the APE, whose boundaries were, in general, within a block of the proposed streetcar alignment (see Figure 3-9). One site, CA SAC 394H, is adjacent to the APE boundary. This site was recorded in 1980 as “several discrete refuse deposits and many structural remains.” The site is associated with several demolished structures, dating to the last half of the nineteenth century, which extend along one city block bound by 6th, 7th, J, and K Streets. The associated artifacts included various domestic debris.

Two other sites, further from the alignment and outside the APE, have artifacts recovered. The boundaries for these sites are undefined and the subsurface materials may be distributed over a larger area, extending to the proposed alignment. The two sites are: CA SAC 36, recorded in 1934 with no site description or discussion of any associated cultural constituents; and CA SAC 38, between 9th Street and 10th Street, and I Street and J Street. Minimal subsurface testing recovered a variety of artifacts, including flaked stone, groundstone, burnt clay, shell, bone, fire-cracked rock, and charcoal. The site is covered by imported fill from the construction of Plaza Park in 1872. The site’s depth and boundaries remain undetermined.

4.6.1.2 Field Reconnaissance

After the results of the record search were analyzed, an intensive pedestrian survey within and along the APE boundary was undertaken. Due to the narrow corridor defined by the APE, the field reconnaissance was conducted by walking tightly spaced transects (less than 5-meter intervals) parallel to and within the APE. The area is characterized as primarily urban and/or developed. All areas were inspected for the presence of cultural materials including, but not limited to, prehistoric and historic habitation debris, prehistoric features, and historic structural remains. Despite efforts to locate areas of native soil, ground visibility over the majority of the proposed project area is essentially nonexistent.

4.6.2 Archaeological Resources Impact Analysis

4.6.2.1 No-Project Alternative

Because the No-Project Alternative would not implement the Streetcar Project Alternative, no subsurface cultural resource artifacts would be encountered. If RT constructs extensions to its light rail network as indicated in the SACOG MTP, mitigation measures related to cultural resource discoveries would be included in the extension’s mitigation monitoring plan.

4.6.2.2 Streetcar Project Alternative

Construction and Operation Impacts

Impact CR-1: Construction activities could encounter subsurface cultural resources.

The downtown Sacramento area has a long and culturally rich prehistory and history. Historical sites in the area span from the Gold Rush era to the development of the city as the state’s Capitol. Prehistoric sites date back 8,000 years. Excavations in the area have yielded diverse artifact assemblages and, in some cases, human remains.

The field survey yielded no new cultural resource discoveries. This area has been heavily studied, as evidenced by the numerous cultural resource surveys listed above. As recorded, no

prehistoric sites and only one nonstructural historic site are within or adjacent to the direct APE. As recorded, CA SAC 394H is associated with several historical buildings and its boundaries do not appear to extend into the public street right-of-way. Although unlikely to occur during project construction, which would occur within the public right-of-way, previously undocumented prehistoric and historic sites, in many cases capped by building and road development within downtown Sacramento, have been discovered during underground construction activity. Discovery of subsurface cultural material would be a significant impact.

Mitigation. It is recommended that monitoring of any subsurface excavations during construction be undertaken by a qualified archaeologist. In the event that any cultural discovery is made by construction crews, work would halt in the immediate area, and the archaeologist will be notified to evaluate the find and determine appropriate mitigation strategies.

Determination. By following the aforementioned mitigation procedures, the impact on subsurface cultural resources by the proposed project would be considered less than significant.

4.6.3 Historic Properties Study Methods and Significance Criteria

The analysis complies with applicable sections of the National Historic Preservation Act and the implementing regulations of the Advisory Council on Historic Preservation, as these pertain to federally funded undertakings and their impacts on historic properties. The properties have also been evaluated in accordance with Section 15064.5(a)(1)-(4) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. One of the resources within the proposed project APE, The Tower Bridge (Reference #1), is listed in the NRHP: None of the other three properties evaluated for the proposed project appear to meet the criteria for listing in either the NRHP or CRHR, nor should they be considered historical resources for the purposes of CEQA. The DPR 523 forms documenting these buildings and structures appear in Appendix B.

4.6.4 Historic Properties Impact Analysis

4.6.4.1 No-Project Alternative

Since the No-Project Alternative would not implement the Streetcar Project Alternative, no historic resources would be affected.

4.6.4.2 Streetcar Project Alternative

Construction and Operation Impacts

Impact CR-2: Project implementation would alter the physical structure or modify the setting for historic structures.

Two buildings, one bridge, and one landscape feature within the APE and identified in Table 4-8 were greater than 45 years old and required formal evaluation. They are described below. Full evaluations of these properties are presented in the DPR 523 forms in Appendix B.

Table 4-8. Historic Properties within the APE

Reference No.	Name	Address	Year Built	Eligibility
1	Tower Bridge	22 0021	1934	Listed in NRHP; Office of Historic Preservation (OHP) Code 1S
2	Capitol Mall landscape	Capitol Mall 2nd Street to 9th Street	1959-1980	Not eligible; OHP Code 6
3	Education Building	715 Capitol Mall	1953	Not eligible; OHP Code 3
4	Employment Building	700 Capitol Mall	1955	Not eligible; OHP Code 6

Reference #1. The Tower Bridge was listed on the NRHP in 1981. This structure is a historical resource.

Reference #2. Under Criterion A or 1, the Capitol Mall (Map Reference #2) between Tower Bridge and 8th Street does not appear to be significant for its association with the City Beautiful movement. The development and planning for the mall was an attempt to mimic projects in other cities and, while a result of redevelopment in the West End of Sacramento, plans for the Capitol Mall had been in place before the redevelopment projects began. Under Criterion B or 2, the Capitol Mall does not appear to be associated with any historically significant people. The Capitol Mall is a design element and not associated with individual people’s lives. Under Criterion C or 3, the Capitol Mall does not possess any distinctive characteristics or high artistic value that would render it eligible under these criteria. As discussed above, the Capitol Mall was not an innovative plan. It attempted to bring monumental mall projects developed in other cities to Sacramento. The implementation of the Sacramento Capitol Mall was well after the City Beautiful movement and occurred in the subsequent age of freeway planning. In addition, the plan for the Capitol Mall was not comprehensive, but a zoning ordinance that was altered during construction to fit the developing needs of transportation in downtown Sacramento.

Reference #3. The Rehabilitation Building was previously evaluated in 2003 by Jessica B. Feldman of Myra L. Frank and Associates. That evaluation concluded that while the building was a part of the development of state buildings along Capitol Mall beginning in the 1950s, it did not appear to have significance for involvement with that development under Criterion A. The Department of Education used the building from 1953 to 2002 for general office space, but the building has no association with historic events because of this use, and is therefore not important within this context. Under Criterion B, the building was not associated with significant individuals. Under Criterion C, the building was designed by Harry J. Devine and supervised by architect Alfred Eichler. The building does not embody important characteristics of its type, period, or method of construction, nor does it appear to be an important example of the work of either architect.

Reference #4. Under Criterion A or 1, the Employment Building does not appear to be significant for its association with the development of state government, or the initial

redevelopment of the West End area of Sacramento. The Employment Development Department had been in existence since 1915, and while the construction of the new building coincided with the implementation of new publications and services, the building does not have specific important associations with that change. Under Criterion B or 2, the Employment Building does not have direct associations with any historically significant individuals. The building has housed numerous offices for officials and employees of the Employment Development Department and its predecessors, and while it has housed the department for several decades, it does not embody associations with a specific individual. Under Criterion D or 4, the building is not likely to yield information important to history and its construction is well documented in the records of the State Architect's Office at the California State Archives.

Under Criterion C or 3, the Employment Building is a modest example of a spare International form influenced by the Bauhaus movement. While the building was designed by Alfred Eichler, a long-time and noted architect from the State Architect's Office, it is not one of his masterworks. To be considered an important work of a master, "the property must express a particular phase in the development of the master's career, an aspect of his work, or a particular theme in his work." The Employment Building was designed and constructed shortly after the nearby Education Building, which Eichler also oversaw, and shares similar design elements, especially around the entrances. Neither the Employment Building nor the Education Building employ important characteristics of their type, period, or method of construction, and they do not represent a particular contribution to state government building design and are not eligible for listing under Criterion C. In rare instances, resources themselves can serve as sources of important information about historic construction materials or technologies (Criterion D or 4); however, Capitol Mall is not a principal source of important information in this regard. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and is not a historical resource under CEQA.

These properties have been evaluated in accordance with Section 106 of the National Historic Preservation Act using criteria described in 36 CFR 30; and in accordance with Section 15064.5(a) (2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. All buildings or structures in the Study Area around the proposed Downtown/Riverside Streetcar location that are greater than 45 years old received evaluation. None of the more recently constructed buildings appear to meet the exacting standards of exceptional significance. Therefore, none of the buildings in the Study Area appear to be significant historic properties subject to Section 106, nor do they appear to be historical resources.

Mitigation: No mitigation is required.

Determination. No potentially significant impacts on historic properties would result from project construction or operation.

Cumulative Impacts

Impact CR-3: Potential to produce a considerable contribution to affecting cultural resources.

Development projects occurring simultaneously in the study area would follow mitigation procedures related to cultural resource impacts for each project individually. No cumulative impacts on cultural resources are expected from the proposed project.

4.7 Aesthetics

4.7.1 Study Methods and Significance Criteria

The following section identifies and describes visual and aesthetics changes that would result if the Action Alternatives were implemented. The existing visual landscape surrounding the streetcar alignment, as described in Chapter 3, provides the baseline data for comparing the No-Project Alternative with the visual and aesthetic quality of the area after the project is implemented.

Stills from a visual simulation prepared by Newland and Associates were used as graphic examples of the visual and aesthetic setting described in Chapter 3 and to convey how the visual setting would be transformed if the Streetcar Project Alternative were implemented. The simulations offer an impression of the scale of the streetcar facilities relative to the surrounding landscape without intending to show details of the actual structures as they will be finally designed.

To analyze impacts according to the criteria listed below, views at five critical locations were chosen to indicate whether the scale of the surrounding landscape or the visual resources that distinguish these landscapes would be substantially altered by the project. The five locations are:

- In front of the West Sacramento Civic Center along West Capitol Avenue;
- Tower Bridge Gateway at Raley Field;
- Tower Bridge viewshed;
- Capitol Mall viewshed toward the State Capitol Building; and
- K and 13th Streets.

In accordance with CEQA guidelines, if the visual context is substantially altered to produce significant visual impacts, the impact is described, mitigation measures are proposed, and the significance of the impact after mitigation is determined. Because construction activities would not permanently alter the visual landscape, the analysis focuses on long-term or operational effects.

As indicated in the Regulatory Framework described in Section 3.5, Aesthetics and Visual Resources, the principal regulations that govern design for new construction and limit the appearance, height, and bulk of a new project are local and regional. As such, CEQA guidelines tend to reinforce the issues addressed in permitting new construction. CEQA also considers these criteria in addition to those that provide a more local perspective of on the scale or visual character of the surrounding landscape. As indicated in CEQA Statutes and Guidelines, Appendix G, visual impacts are considered significant if the project would:

- Create a substantial effect on a scenic vista;
- Substantially alter or obstruct scenic resources, including trees;
- Substantially degrade the visual character or quality of the site;
- Substantially contrast with the scale and context of the surrounding landscape; or
- Create a new source of light or glare which would affect views in the area.

4.7.2 Impact Analysis

4.7.2.1 No Project Alternative

The No-Project Alternative would retain the existing visual setting in the study area. Modifications to the skyline and development of vacant and underused blocks would occur

according to West Sacramento Redevelopment Plans and to City of Sacramento permitting requirements of new buildings in the downtown area. The visual changes to the existing setting from these planned development projects are subject to separate environmental analysis for each project or plan area.

4.7.2.2 Streetcar Project Alternative

The Streetcar Project Alternative would add poles, overhead wire, station platforms with shelters, and track to the existing urban landscape. Like other vehicles traveling through this environment, streetcars would move through the urban landscape, temporarily altering the view of the person on the street. Temporary changes in the visual environment, including project construction activities, are not considered significant impacts since no view shed or visual setting would be permanently changed or obstructed.

For those project elements that would permanently change the urban landscape, they are expected to blend in with the existing visual clutter of street signs, overhead wire, traffic signals, bus shelters, and utility poles that line the route.

Specific locations along the alignment have important view shed attributes that are regulated by state and city ordinances or through historic precedence and status. The analysis focuses on these particular locations to determine if the project would alter, obstruct, or degrade the visual quality or character of the environment at these locations according to the impact criteria listed above.

Operations Impact Analysis

Impact AE-1: Potential to substantially degrade the visual character or quality of the site or substantially contrast with the scale and context of the surrounding landscape.

West Sacramento Civic Center

The project's western termination in front of the West Sacramento Civic Center would add a streetcar platform, shelter, overhead wire, and signage in the middle of West Capitol Avenue directly in front of City Hall. As indicated in Figure 4-5, the primary visual feature of the project, the catenary system, is integrated with the light standards and above ground utility lines that parallel the street. The overhead wire and poles are obscured from the City Hall viewer by numerous trees that line the avenue. The station platform, which contains a shelter approximately 10 feet in height, would conform with the elements of the transit center planned for the south side of West Capitol, including landscaping that would soften the urban edge of the street. The landscape improvements would integrate with those being implemented as part of the City's of West Sacramento's West Capitol Avenue Streetscape Master Plan is a multi-phase, \$14-million redevelopment project. The Master Plan would guide redevelopment of 2 miles of this east-west artery from the railroad overcrossing at Tower Court, west to Harbor Boulevard. This Master Plan envisions a civic plaza created in front of City Hall, which would serve as a venue for key City events. The street section near City Hall would consist of four bi-directional travel lanes, each of which would be 11 feet wide; 20-foot sidewalks on each side of the street; 7-foot bicycle paths on each side of the street; and 8 feet reserved for parking/curb and gutters. No significant visual impacts would occur at this location. Cumulative beneficial visual impacts would result from the combined streetscape improvements in front of City Hall.

Tower Bridge Gateway

The visual elements of the project along Tower Bridge Gateway complement and conform with the light standards and utility poles that line the street and provide service to nearby Raley Field, which contains much taller light standards and flag poles than the elements of the streetcar catenary system.

Mitigation. No mitigation is required.

Determination. Visual changes to the character, scale or context of the environment resulting from project implementation would be considered less than significant.

Impact AE-2: Create a substantial effect on a scenic vista or substantially alter or obstruct scenic resources, including trees.

Tower Bridge

As indicated in Figure 4-6, the overhead wire and poles add visual clutter but, along with the dense groves of trees on both sides of the bridge, focus the view toward the Tower Bridge. The streetcar's physical elements also restore a historic component to the Tower Bridge, which originally had electric trains operating across the bridge. The streetcar enhances the scenic vista and visual quality of the bridge, providing a beneficial visual and aesthetic effect to the historic setting of the bridge. Since the streetcar elements would conform with and, in the case of the Tower Bridge, enhance the visual setting at this location, no significant visual impacts would occur. In addition, no impact to the historic setting of the Tower Bridge would occur (refer to Section 4.6.4).

Capitol Mall and the State Capitol Building

As indicated in Section 3.7, State guidelines for proposed development have been adopted to protect the viewshed of the State Capitol Building along Capitol Mall. To meet these guidelines, development must conform to height and setback requirements to maintain the visual presence and character of the Capitol. These guidelines do not pertain to infrastructure that supports the urban environment. Consequently, utility lines and poles, street signs, streetlights, and traffic lights all are permitted to intrude into the view corridor along Capitol Mall extending from Tower Bridge to the Capitol. The clutter of poles and wire includes the catenary facilities for light rail operated by RT across Capitol Mall on 7th and 8th Streets. Figure 4-7 illustrates that the Streetcar Project would add poles and catenary to the grassy median along Capitol Mall. Although not depicted in this visual simulation at 8th Street and Capitol Mall, traffic, light rail vehicles, and overhead wire already interrupt the view looking east to the Capitol. The additional visual elements for the project would conform to the height and linear arrangement of poles and wire that currently occupy this intersection and, as a result, would not, as new visual elements, obstruct, alter, or degrade the view of the Capitol building. Furthermore, the project would reinstate a historic element to the viewshed along Capitol Mall, which had electric-powered rail vehicles operating on this street in the first half of the 20th century. This modification would be considered a benefit to the historic setting of the Capitol.

K Street Pedestrian Mall and 13th Street

At locations where the streetcar would share a narrow public right of way, such as along K Street pedestrian mall between 12th and 13th Streets and along 13th Street between J and L Streets, the project sponsor would assume responsibility to enhance the landscaping and



WEST SACRAMENTO CIVIC CENTER

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California



FIGURE 4-5



**TOWER BRIDGE GATEWAY
LOOKING TOWARD TOWER BRIDGE**

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California

URS

FIGURE 4-6



CAPITOL MALL LOOKING TOWARD STATE CAPITOL

September 2008
25696500

Downtown/Riverfront Streetcar
West Sacramento, California

URS

FIGURE 4-7

design of these segments of K and 13th Streets so that any visual change caused by integrating streetcar facilities into the urban landscape would be considered less than significant.

Mitigation. No mitigation is required.

Determination. Visual changes in the view sheds for the Tower Bridge, the State Capitol, and K Street Mall resulting from project implementation would be considered less than significant.

Impact AE-3: Create a new source of light or glare which would affect views in the area.

Station Locations

Lighting for the station stops along Capitol Mall and other locations would have limited wattage emanating primarily from the shelters and muted by the radiance of the streetlights along the public right of way. The incremental increase in light would not affect views of the State Capitol or the Tower Bridge, or substantially contribute to existing light and glare along the public right of way. As a result, no impact from station area lighting is expected.

Mitigation. No mitigation is required.

Determination. Visual impacts resulting from station lighting would be considered less than significant.

Cumulative Impact Analysis

Impact AE-4: Substantially contribute to visual change resulting from project development in the study area.

As indicated above, the Streetcar Project Alternative would add poles, overhead wire, station platforms with shelters, and track to the existing urban landscape. These elements would conform with existing street furniture and utility lines placed along the streetcar alignment. Additional visual elements resulting from nearby planned development projects, including the construction of mid-rise and high-rise buildings, would overshadow the limited visual change produced by the project. No cumulative visual impacts are expected.

Mitigation. No mitigation is required.

Determination. The project would not substantially contribute to visual changes occurring in the study area.

4.8 Air Quality

4.8.1 Study Methods and Significance Criteria

The proposed streetcar will span Sacramento and Yolo counties. These counties are under the jurisdiction of the SMAQMD and the YSAQMD, respectively. CEQA Guidelines allow applicable counties and air districts to develop significance thresholds for both short-term (construction) and long-term (operational) air pollutant emissions. Both the SMAQMD and the YSAQMD suggest the lead agency should “provide substantial evidence that supports their conclusions in an explicit, quantitative analysis whenever possible.” Impacts to air quality occur during the construction of the proposed project. The construction emissions were analyzed using the Roadway Construction Model, as recommended by both air quality management districts. There are no direct operational emissions from the proposed project, and indirect emissions resulting from traffic will be reduced according to the traffic analysis.

In accordance with CEQA guidelines (Appendix G: Environmental Checklist Form), the significance criteria established by SMAQMD and YSAQMD for construction activities and operations are used to determine air quality impacts as follows:

- Construction:
 - Construction emissions exceed significance thresholds shown in Table 4-9 in the SMAQMD jurisdiction area or Table 4-10 in the YSAQMD jurisdiction area.
 - A project that may cause an exceedance of a state air quality standard, or make substantial contribution to an existing exceedance of an air quality standard.

Table 4-9. Summary of Significance Thresholds for SMAQMD

Air Pollutant	lbs/day
Construction NO _x	85
Operational ROG	65
Operational NO _x	65

Source: SMAQMD, 2007a

Notes:

- NO_x = nitrogen dioxide
- ROG = reactive organic gases
- SMAQMD = Sacramento Metropolitan Air Quality Management District

Table 4-10. Summary of Significance Thresholds for YSAQMD (applicable to both construction and operational emissions)

Air Pollutant	Significance
ROG	10 (tons/yr)
NO _x	10 (tons/yr)
PM ₁₀	80 (lbs/day)
CO	Violation of a state ambient air quality standard for CO

Source: YSAQMD, 2007b

Notes:

- CO = carbon monoxide
- NO_x = nitrogen dioxide
- PM₁₀ = particulate matter less than 10 micrometers in aerodynamic diameter
- ROG = reactive organic gases
- YSAQMD = Yolo-Solano County Air Quality Management District

- Operational:
 - Mobile-source emissions (local to the proposed project) of CO violate or contribute substantially to a violation of the NAAQS or CAAQS.
 - The proposed project exposes members of the public to objectionable odors.

- The proposed project has the potential to expose sensitive receptors (including residential areas) or the general public to substantial incremental increases in TAC emissions that exceed 10 chances per million of excess cancer risk for the Maximally Exposed Individual (MEI) and/or a Hazard Index of 1 for non-cancer risk for the MEI.
- The proposed project would be considered to have a significant cumulative air quality impact if it would individually have a significant air quality impact. For any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be based on an evaluation of the consistency of the proposed project with the local and regional air quality plans.
- The proposed project would generate emissions of GHGs that would conflict with the state goal of reducing GHG emissions in California to 1990 levels by 2020, as set forth by the timetable established in Assembly Bill 32 (California Global Warming Solutions Act of 2006).

Both districts recommend following a quantitative approach for their air quality assessment to determine the significance prior to the application of mitigation measures. “An impact analysis should support its conclusions by providing explicit reasoning. A quantitative approach should be used whenever possible, particularly when there are quantitative significance thresholds (YSAQMD, 2007b).” “When considering a project’s impact on air quality, a lead agency should provide substantial evidence that supports its conclusions in an explicit, quantitative analysis whenever possible (SMAQMD, 2004).”

4.8.2 Impact Analysis

4.8.2.1 No-Project Alternative

The No-Project Alternative would continue to implement measures identified in the air district’s Air Quality Attainment Plan to bring the region into conformity with state and federal guidelines.

4.8.2.2 Streetcar Project Alternative

Construction Impacts

Impact AQ-1: Construction of the proposed project would result in emissions of criteria pollutants.

As stated in the SMAQMD’s Guide to Air Quality Assessment, construction emissions can represent the largest air quality impact associated with a project, which is the case for the proposed project. Construction activities include site preparation, earthmoving, and general construction activities.

Both the SMAQMD and the YSAQMD recommend the use of the Roadway Construction Emissions Model for estimating emissions from new road construction, road widening, pipeline construction, and bridge and overpass construction projects. Although the construction phases in the model do not exactly match the construction phases for the proposed project, it was assumed that the default equipment types, the duration, and the quantities contained in the model would be representative of the proposed project. The SMAQMD Roadway Construction

Model Version 5.2 was used to estimate short-term construction impacts of the proposed project. The following inputs were used for the analysis.

- Project Type: (2) – Road Widening
- Construction Start Year: 2010
- Project Construction Time: 25 months
- Maximum Area Disturbed/Day: 5 acres
- Soil Imported/Exported: 500 yd³/day
- Water Trucks Used: (2) – No

Construction of the proposed project would result in short-term impacts to the existing air quality in the area. These impacts include temporary increases of CO, carbon dioxide (CO₂), NO_x, PM₁₀, PM_{2.5}, ROG, and oxides of sulfur (SO_x) emissions. Emissions resulting from the construction of the proposed project are broadly categorized as follows:

- Equipment exhaust (CO, CO₂, NO_x, PM₁₀, PM_{2.5}, ROG, and SO_x);
- Fugitive dust from earth moving activities (PM₁₀, PM_{2.5});
- Employee vehicle emissions (CO, CO₂, NO_x, PM₁₀, PM_{2.5}, SO_x, and ROG);
- Construction truck emissions (CO, CO₂, NO_x, PM₁₀, PM_{2.5}, SO_x, and ROG); and
- Paving emissions (ROG).

Equipment exhaust emissions are generated from the combustion of fuels used for the operation of construction equipment. Fugitive dust emissions are generated by the suspension of particulate during earthmoving activities. Employee vehicle emissions and construction truck emissions are generated from the combustion of fuels as well as from the entrainment of road dust during travel along roadways onsite and offsite of the construction area.

Construction of the proposed project would create short-term emission increases of criteria pollutants and precursors. The maximum estimated emissions from the Roadway Construction Model were 11 lbs/day of ROG, 44 lbs/day of CO, 44 lbs/day of NO_x, and 53 lbs/day of PM₁₀, all below the YSAQMD and SMAQMD construction thresholds (see Section 3.8, Air Quality). These emission levels are below significance thresholds and, as a result, no air quality impact would occur because of construction activities.

Mitigation. Since these emissions are all below the thresholds of significance for both air quality management districts, no mitigation is required.

Determination. After estimating the construction emissions using the Roadway Construction Model, the impacts from construction of the proposed project would be less than significant.

Impact AQ-2: The proposed project would expose sensitive receptors or the general public to substantial incremental increases in TAC emissions.

The air quality management districts consider any project that has the potential to expose public receptors to a substantial level of TACs to have a significant impact. A sensitive receptor is defined as a location where human populations are found, especially children, seniors, and sick persons, and there is reasonable expectation of continuous human exposure over the averaging periods addressed in the ambient air quality standards (e.g., 24 hour, 8 hour, 1 hour). Sensitive receptors typically include residences, hospitals, schools, and parks. The air quality

management districts also consider a project with the potential to expose the general public to substantial incremental increases in TAC emission as indicated in the Significance Criteria above.

During construction of the proposed project, diesel exhaust is generated from the operation of diesel-fueled construction equipment and vehicles (i.e., diesel construction equipment, delivery/haul trucks, and worker commute vehicles). Diesel exhaust contains a variety of gaseous and solid particulate chemical compounds, many of which have been identified to lead to a variety of human health problems, including cancer, with chronic exposure.

Due to the short-term nature of the construction TAC-emitting activities (compared to a 70 year exposure scenario), it is not expected that any sensitive receptors would be exposed to high annual (chronic long-term) concentrations of TAC. The cancer risk associated with TAC emissions would be below the thresholds listed above. Therefore, the impact of TAC from construction of the proposed project is considered less than significant. In addition, there would be no TAC emissions because of operating the streetcar, because there are no direct operating emissions and emissions from traffic will be reduced because of the proposed project.

Mitigation. No mitigation is required.

Determination. The impacts of TACs from the proposed project are less than significant because they are below emissions thresholds.

Operation Impacts

Impact AQ-3: Mobile source emissions of CO would violate or contribute substantially to a violation of the NAAQS or CAAQS.

The proposed project would operate electric streetcars with no direct emissions. The only potential indirect emissions would result from traffic impacts caused by the proposed project. Regional CO emissions and ambient concentrations have decreased greatly in recent years. These reductions are largely a result of the introduction of cleaner burning motor vehicles and fuels, which are still the dominant source of CO emissions. In 2004, motor vehicles contributed approximately 71 percent of total CO emissions in the Sacramento Valley (YSAQMD, 2007b). Residential and agricultural burning and other mobile and miscellaneous sources contribute to the remainder. There have been no recorded violations of the federal or state CO ambient air quality standards at district monitoring stations. Despite this, CO concentrations are still a concern for the districts because:

- The area must maintain ambient air quality standards; and
- CO is a localized pollutant (meaning CO tends to reside nearby the source of emissions).

As such, it is possible for areas of high traffic volumes/congestion to experience elevated levels of CO, or “hotspots,” creating adverse localized impacts while concentrations at nearby monitoring stations are below state and national standards. CO hotspots are a concern for operational impacts from the proposed project. YSAQMD recommends using a screening approach developed by the San Joaquin Valley Unified Air Quality Management District to estimate whether a project’s traffic impacts would cause a potential CO hotspot at analyzed intersections. If either of the following criteria is true of any intersection affected by the

proposed project traffic, then the proposed project can be said to have the potential to create a violation of the CO standard:

- A traffic study for the proposed project indicates that the peak-hour LOS on one or more streets or at one or more intersections in the proposed project vicinity would be reduced to an unacceptable LOS (typically LOS E or F); or
- A traffic study indicates that the proposed project would substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the proposed project vicinity. “Substantially worsen” includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

The traffic study predicts a decrease in traffic delays at most intersections (see Section 4.5.2). Therefore, the studied intersections for the proposed project do not violate either criterion above.

Mitigation. No mitigation is required.

Determination. The impacts of the proposed project for localized CO violations for CAAQS or NAAQS are less than significant.

Impact AQ-4: Operational emissions from the proposed project would exceed 65 lbs per day of ROG or NO_x for SMAQMD and 10 tons per year of ROG or NO_x or 80 lbs per day of PM₁₀ for YSAQMD.

Both air quality management districts have established O₃ precursor and PM₁₀ thresholds because Sacramento and Yolo counties exceed state and federal ambient air quality standards for O₃. These thresholds are given in Section 3.8, Air Quality. There will be no operational emissions from the proposed project, so emissions from the proposed project will not exceed either air quality management district’s significance thresholds.

Mitigation. No mitigation is required.

Determination. The traffic analysis (Section 4.5.2) indicates that the proposed project would reduce congestion at several study area intersections, thereby reducing indirect emissions from traffic. Therefore, the impacts from the operation of the proposed project would be less than significant.

Impact AQ-5: The proposed project would expose members of the public to objectionable odors.

Inhalation of objectionable odors rarely results in any physical harm to humans. However, particular odors are disagreeable and can cause discomfort to members of the public who are frequently exposed to them. For this reason, odor complaints are a frequent grievance received by air quality management districts. Projects that have the potential to frequently expose the public to objectionable odors are, therefore considered by the air quality management districts to be a significant impact. The YSAQMD suggests screening for odor impacts for the following two situations:

- Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- Residential or other sensitive receptor projects or other projects that may attract people locating near existing odor sources.

The severity of odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and sensitivity of the receptor. In general, odors are usually associated with sources such as wastewater treatment plants, composting facilities, and chemical plants. Such inherently odorous sources are not part of the proposed project. In general, road development projects would not expose sensitive receptors to sources of odors. Furthermore, the proposed project is an electric streetcar with no operational emissions and no direct odorous emissions.

Mitigation. Since the proposed project neither generates odorous emissions nor attracts people locating near existing sources, no mitigation is required for the proposed project. Furthermore, based on guidance provided by the YSAQMD, the proposed project is not considered a common odor source and should not warrant special consideration.

Determination. No odor impacts would result from the proposed project.

4.8.3 Cumulative Impacts

Impact AQ-6: The proposed project would have a considerable contribution to air emissions locally and in the region.

For ground level O₃, the districts prepare air quality plans that address attainment of the state and federal O₃ ambient air quality standards. These plans accommodate growth by projecting growth in O₃ precursor emissions based on different indicators. Through the air quality planning process, O₃ precursor emission growth is offset by regional controls on stationary, area, and transportation sources of air pollution. Project O₃ emissions above individual thresholds have not been accommodated in the air quality plans and are, therefore, not consistent with air quality plans. Emissions would have a significant cumulative impact on regional air quality unless O₃ precursor emissions above the thresholds are offset. There are no operational emissions from the proposed project. Therefore, the proposed project would operate within the O₃ precursor thresholds and the cumulative impacts would be less than significant.

Mitigation. No mitigation is required.

Determination. The cumulative air quality impacts are less than significant.

4.8.4 Conformity Requirements

As the proposed project lies in a federally designated “nonattainment” area, and is a transportation project, the transportation conformity regulations must be met. As stated by the SMAQMD, “the primary requirements of transportation conformity include a requirement that transportation plans and programs cannot produce more emissions than were budgeted for in the latest SIP. In addition, projects receiving federal funds or approvals must undergo localized air quality modeling. Finally, emissions from local projects with no federal funding must be included in regional plans and program, if the sponsoring agency receives any federal funds.” The YSAQMD states, “This

requires that a federal action must not adversely affect the timely attainment and maintenance of national air quality standards.” In other words, Transportation Conformity requires that federal transportation actions conform to the SIP. SACOG, through an interagency consultation process, makes transportation conformity determinations when it compares the MTP to the motor vehicle emission budgets of the SIP. The MTP includes, but is not limited to, transportation plans, projects, and programs that receive federal funds. If the estimated emissions from MTP projects are less than the vehicle emission budgets in the SIP, the Plan is considered to have a less-than-significant impact. Because the proposed project would emit pollutants below the respective thresholds of significance, the proposed project would maintain conformity, and no mitigation would be required.

4.8.5 Greenhouse Gas Discussion

Currently, there are no published thresholds of significance for measuring or determining the impact of GHGs from a project to global climate change. The Governor’s Office of Planning and Research is responsible for adopting regulations implementing CEQA, but that agency has not promulgated any regulations directly concerning analysis of global climate change. CARB is the statewide agency responsible for administering air quality programs within the state, and has been tasked with developing many of the regulatory programs required by Assembly Bill 32, but CARB likewise has not developed any regulations, guidance, or recommendations regarding evaluation of global climate change within CEQA documents. The SMAQMD and YSAQMD are the regional agencies responsible for regulating air emissions within the proposed project area, but have yet to developed guidance regarding evaluation of global climate change within CEQA documents.

In the absence of adopted regulations, thresholds, or guidance, this section provides a qualitative component demonstrating how the proposed project would comply with existing federal and state emission reduction strategies, including the state’s goals of reducing GHG emissions to 1990 levels by 2020. With this approach, it is possible to conclude that if the proposed project implements all feasible and applicable emissions reduction strategies, it would have a less-than-significant impact on global climate change.

Construction of the proposed project would result in short-term and temporary increases in GHG emissions. These increases are associated with the operation of construction equipment, material hauling vehicles, and construction employee vehicles. Construction of the proposed project is not expected to conflict with the state’s goals of reducing GHG emissions to 1990 levels by 2020 and would have a less-than-significant impact on global climate change. Operation of the proposed project would lower traffic impacts, resulting in decreased GHG emissions. In addition, reduced traffic congestion is expected to decrease GHG emissions.

4.9 Noise and Vibration

4.9.1 Study Methods

4.9.1.1 Construction Noise

Construction noise and vibration varies according to the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, and the schedule proposed to carry out each task (e.g., hours and days of the week). The assessment of potential significant impacts due to construction noise from implementing the Streetcar Project Alternative is based on the standards procedure described in the FTA guidance manual and the Federal Highway Administration (FHWA) RCNM model (FHWA, 2006). This analysis of

construction noise assumes that noise decreases at a rate of 6 dB per doubling the distance from the center of the construction site (decibel acronyms are defined in Section 3.9.1). Table 4-11 shows the noise emission levels and the percentage of usage assumed for calculation of significant noise impacts.

Table 4-11. Construction Equipment Noise Levels

Equipment	Acoustical Use Factor for Noise (percentage)	Typical Maximum Noise Level (L_{max}) at 50 feet from Source, dBA
Backhoe	40	78
Dump Truck	40	77
Compactor	20	83
Excavator	40	81
Dozer	40	82
Mounted Impact Hammer (hoe ram)	20	90
Pneumatic Tool	50	85
Concrete Pump Truck	20	81
Vibratory Concrete Mixer	20	80

Sources: FHWA, 2006 and FTA, 2006.

For the purpose of this initial evaluation, two phases or stages for construction have been assumed: (1) construction activities involving demolishing the existing pavement, excavating, and preparing the soil; and (2) guideway installation, involving laying down the rail tracks and paving. The streetcar alignment is planned to be at-grade with embedded tracks. Therefore, no pile driving³ would be involved during construction. It is assumed that construction would occur only between the hours of 7:00 a.m. and 6:00 p.m., to conform to Sacramento noise ordinance (West Sacramento does not have a time-based noise ordinance incorporated into the General Plan).

The projected levels of noise generated by construction activities were compared against the FTA and local criteria. Noise control measures were investigated and presented in those areas where noise from construction activities is expected to exceed the local ordinance.

4.9.1.2 Construction Vibration

The assessment of potential significant impacts due to construction-induced vibration is based on the standard procedures described in the FTA guidance manual. Construction vibration varies according to the construction procedure, type of equipment involved, and location of the construction site with respect to sensitive receptors. Buildings near the construction activities respond to vibration in a different manner, depending primarily on their structural characteristics.

For the purpose of this initial evaluation, two phases or stages for construction have been assumed: (1) construction activities involving breaking the existing pavement, excavating, and

³ Pile driving normally produces the highest noise levels and highest vibration of all construction equipment.

preparing the soil; and (2) guideway installation involving laying down the rail tracks and installing the concrete slab. The streetcar alignment is proposed to be at-grade with embedded tracks. Therefore, no pile driving (normally the piece of equipment that produces the highest levels of vibration) would be involved during construction.

Table 4-12 shows the equipment assumed for this analysis. Vibration reference levels are presented in terms of the peak-particle velocity (PPV) and its approximate vibration level, both at a distance of 25 feet.

Table 4-12. Construction Equipment Vibration Levels

Equipment	PPV at 25 feet (in/sec)	Approximate Vibration Velocity Level at 25 feet, VdB
Dump Truck	0.076	86
Vibratory Roller	0.200	94
Hoe Ram	0.089	87
Pavement Breaker	0.400	103
Jack Hammer	0.035	79

Source: FTA, 2006 and WIA, 2008.

The projected levels of vibration generated by construction activities were compared against the applicable criteria. Vibration control measures were investigated and presented in those areas where noise and vibration from construction activities are expected to exceed the applicable criteria.

4.9.1.3 Streetcar Operation Noise

The methodology used in assessing noise and vibration impacts from operations of the proposed project is also contained in the FTA guidance manual. Based on this guidance, a screening level analysis, which is a simple procedure based on distances of potential impacts from the rail alignment, is applied. The screening distance defines the area of study with the potential for impact. This analysis allows focusing further noise and vibration analyses in areas where an impact is likely to occur. The procedure to determine the noise screening distances is based on the assumption that an outdoor L_{dn} of 50 dBA is achievable.

For the noise and vibration analysis, it was assumed that trains would be operating during the day and into the evening at 10-minute and 15-minute headways during peak and off-peak operations, respectively. Although train speed could vary depending on the location along the route, an average speed of 20 mph was used unless otherwise stated. However, to determine the “critical” distance for this initial analysis, only the higher speed was used. Streetcar vehicles are proposed to operate on embedded tracks, which would increase wayside noise levels by 3 dBA with respect to similar vehicles on ballast and tie tracks. This wayside noise level would apply to track embedded in the grass median along Capitol Mall. Modern streetcar vehicles are expected to generate a sound exposure level of 77 dBA or its equivalent maximum level of 72 dBA for a single 50-foot-long vehicle at 50 feet from the track centerline operating at 20 mph. Modern streetcars usually have resiliently supported wheels, which reduce the potential for squeal noise. The actual noise level would be based on the tightness of the curve

and the type of wheels used. Noise from special trackwork (i.e., crossovers) and crossing signals were evaluated as point sources. Standard reference levels presented in the guidance manual were used for these projections.

The proposed project would share the existing light rail storage and maintenance facility at Academy Way. Vehicle storage is proposed on a single exclusive tail track on the western side of the alignment. The tail track is proposed on West Capitol Avenue west of the proposed Streetcar stop at City Hall. The assessment for potential noise impacts at storage areas was based on the methodology described by FTA for vehicle wayside noise but using a lower speed (10 mph).

4.9.1.4 Streetcar Operation Vibration

The screening analysis for vibration, as with noise, is based on distances from the rail alignment to determine the likelihood that GBV from the proposed project could affect receptors within the screened area. The implication is that receptors beyond the relevant screening distance would not be significantly impacted, and further analysis would therefore not be needed. Five categories for different types of transit projects are provided in the FTA guidance manual, four of which are for steel rail vehicles and the fifth is for rubber-tired vehicles. The proposed project falls under the Light Rail Transit category, with screening distances of 450 feet, 150 feet, and 100 feet per use category. These screening distances are indicated in the FTA guidance manual with “normal” soil vibration propagation characteristics. The distances recommended by FTA include a 5 VdB safety factor. Based on field measurements, there is no evidence of efficient vibration propagation in the soil to modify the extent of the critical distances beyond those previously indicated (WIA, 2008).

The projection of GBV, which is described in the FTA guidance manual, is based on a reference curve for generalized ground surface vibration from locomotive powered passenger or freight, and light or heavy rail rapid transit vehicles. The assessment uses only an overall level and applies adjustments to account for vehicle speed, track support, and building amplification among other factors.

The proposed project would share the existing light rail storage and maintenance facility at Academy Way. Potential vibration impacts at the Academy Way Facility were determined based on the number of streetcar vehicles with respect to LRT vehicles.

4.9.2 Significance Criteria

Community noise and vibration impacts associated with operation of the proposed project would result if:

- The increase in total (cumulative) noise levels from streetcar operations and the existing ambient exceeds the threshold for Severe Impact, as indicated in the FTA guidance manual and presented herein;
- The level of impact projected from streetcar operations is Moderate Impact and the increase over the existing ambient noise associated to Moderate Impacts is higher than 5 dBA;

- Construction activities exceed the noise and vibration standards in Tables 4-11 and 4-12 during the hours where construction is not exempt from the Noise Ordinance;
- Operations of substations and ancillary facilities exceed the noise criteria (adjusted) levels in Table 4-11. Noise levels presented in the table include a 5 dBA reduction (penalty) to account for simple tones; or
- The cumulative increase in noise levels from streetcar operation would be greater than 1 dBA when compared with the No-Project Alternative noise levels.

4.9.3 Impact Analysis

4.9.3.1 No-Project Alternative

The No-Project Alternative would not implement the Streetcar Project Alternative. No new noise and vibration would occur in the study area beyond those ambient levels currently generated through normal construction, traffic, and transit operation. The No-Project Alternative would be affected by increases in noise levels due to changes in vehicular traffic. Future noise levels would be mainly dictated by the increases in traffic volume. Noise levels from traffic with lower speeds and higher congestion would be generally lower than similar traffic volumes under free-flow condition. However, for the purposes of this analysis, the increase associated with No-Project conditions has been determined exclusively from anticipated changes to the traffic volumes. Based on these assumptions, future ambient noise levels under this scenario would be 5 to 6 dBA higher than the existing ambient noise dBA. In most areas, the community noise environments would remain consistent with the Sacramento Noise Element's *Conditionally Acceptable* designation. However, in the area of 7th Street and 8th Street, cumulative noise for 2035 would be *Clearly Unacceptable* due to the anticipated traffic increase, an unavoidable impact.

4.9.3.2 Streetcar Project Alternative

Construction Noise Impacts

Impact N-1: Construction noise could affect sensitive receptors along the proposed streetcar alignment.

For assessing impact, the analysis considered equipment types based on separate construction phases:

- Phase 1 (Excavation): During excavation, the proposed project would use backhoes, mounted impact hammer (hoe ram), excavators, dozers, compactors, vibratory rollers, pneumatic tools, and dump trucks to haul spoils.
- Phase 2 (Track installation): During track installation, the proposed project would use vibratory concrete mixers and concrete pump trucks.

The greatest source of noise during excavation would be a mounted impact hammer, and during track installation, the concrete pump trucks. The greatest expected levels of noise during construction at the location of noise sensitive receptors in West Sacramento would be between 66 and 86 dBA Leq. Along the area of downtown Sacramento, construction noise is exempt from the local noise ordinance between 7:00 a.m. and 6:00 p.m., assuming that internal combustion engines are equipped with suitable exhaust and intake silencers and are in good

working condition⁴. The hours assumed for construction activities in this analysis were encompassed within the hours of exemption from local ordinance.

West Sacramento has no provisions regarding construction noise exemption in the General Plan. Instead, a summary of the expected level of noise due to construction activities at the location of sensitive receptors in the West Sacramento area was used to determine a potential impact. A list of sensitive receptors and anticipated noise levels during construction is indicated in Table 4-13. Noise levels in excess of the noise criterion include seven hotel buildings on West Capitol Avenue, the Center for Spiritual Awareness, and an estimated 34 total receptors on three residential projects along Tower Bridge Gateway. Noise impacts associated with construction activities would occur during short periods of time.

Mitigation. To eliminate construction noise impacts, construction activities will be performed in accordance with local ordinances and local allowable hours. If night construction activities were mandated, the contractor would adhere to local noise restrictions for nighttime activities or receive a variance from the city. In addition, to reduce impacts from long-term construction activities (longer than 2 weeks), construction activities will be conducted in compliance with the criteria presented in this report.

To control the potential impacts to the nearby community during construction of the proposed project, the following array of mitigation strategies could be employed:

- Locate noisy equipment as far as possible from noise sensitive receptors. In addition, temporary barriers should be employed around the equipment.
- Use temporary noise barriers along the proposed project right-of-way. Barriers/curtains must achieve a Sound Transmission Class of 30 or greater in accordance with American Society for Testing and Materials (ASTM) Test Method E90, and be constructed from material having a surface density of at least 2 lb/sq. ft., to ensure adequate transmission loss.
- Use sound absorption for temporary barriers in the area of downtown Sacramento. In this area, a reverberant environment is produced due to the narrow distance between buildings and hard pavement surfaces. Line the inner face of the temporary barrier or use a curtain with an absorptive face. The absorptive liner or absorptive face should have a Noise Reduction Coefficient rating of 0.70 or greater in accordance to ASTM Test Method C423.
- Require ambient sensitive (“smart”) backup alarms, SAE Class D, or limit to SAE Class C (97 dB).
- Fit silencers to combustion engines. Ensure that equipment has quality mufflers installed, in good working condition.
- Switch off engines or reduce to idle when not in use.

⁴ Required, per the West Sacramento Noise Ordinance.

Table 4-13. Projected Noise Levels and Impacts during Construction in the City of West Sacramento

Location	Civil Station	Land Use	Dist. to Receptor (ft)	Daytime Criteria	Projected Noise Level for Phase 1 Without Noise Control			Projected Noise Level for Phase 2 Without Noise Control		
					L _{eq} (dBA)	Impact Type	# Impacts	L _{eq} (dBA)	Impact Type	# Impacts
West Sacramento City Hall	13+00	Office	90	85	82	NI	0	71	NI	0
Future Community College	13+00 to 16+50	School	70	85	85	NI	0	74	NI	0
Arthur F. Turner Branch Yolo County Library – 1212 Merkly Ave	15+00	Library	310	85	72	NI	0	61	NI	0
River City Apostolic Church – 1205 Merkly Avenue	15+00	Church	580	85	66	NI	0	55	NI	0
Silvey's Motel 1030 W Capitol Ave	18+00	Hotel	70	80	85	I	2	74	NI	0
Center for Spiritual Awareness 1020 W. Capitol Ave	18+00 to 24+50	Church	60	85	86	I	1	75	NI	0
Budget Motel – 964 W. Capitol Ave	26+00	Hotel	60	80	86	I	4	75	NI	0
Old Town Inn	26+00	Hotel	80	80	83	I	1	72	NI	0
Rodeway Inn Capitol	25+00 to 30+00	Hotel	95	80	82	I	1	71	NI	0
(New) The Ironworks South side of 275	31+50	MF	220	80	75	NI	0	64	NI	0
(New) Washington Street Residential Project	44+00 to 50+00	MF	70	80	85	I	30	75	NI	0
(New) River 1 Mixed Residential, Retail, Hotel Project	52+00 to 57+00	Hotel/Res/Ret	80	80	83	I	1	74	NI	0

Notes:

- SF = Single-family building
- MF = Multi-family building
- I = Impact as per FTA
- NI = No Impact as per FTA

- Lubricate and maintain equipment regularly. Equipment is normally quieter when well maintained.
- Construction-related truck traffic should be re-routed along roadways that would produce the least disturbance to sensitive receptors.

Determination. By implementing a combination of mitigation measures, the potential noise impacts from construction activities would be reduced to a less than significant level.

Construction Vibration Impacts

Impact N-2: Potential for building damage.

The highest vibration would occur during Phase 1 (i.e., demolition). If a pavement breaker is used during this phase, this activity would generate the highest construction vibration. Moreover, such activity would generate a potential for building damage at receptors closer than 40 feet from the pavement breaker. However, if a different technique is used for breaking pavement such as using a hoe ram with hydraulic chisel, the highest construction vibration levels would be generated during soil preparation and compaction. During compaction, the threshold for potential building damage is expected to be exceeded only at 25 feet from the vibratory roller. The contractor will use hydraulic chisels during demolition instead of pavement breakers, to maintain a PPV at amplitude below the criteria for building cosmetic cracking.

Most sensitive receptors are located at a distance of 30 feet or further from the proposed track centerline. Vibration from construction activities would be below the threshold for building damage and therefore result in no significant impact.

During Phase 2 of construction (i.e., tracks installation), expected vibration would be below the 0.2 inch per second (in/sec) criterion for cosmetic building damage, and therefore construction during track installation would result in a finding of no significant impact.

Mitigation. None required.

Determination. No vibration impact on buildings resulting from construction activities is anticipated.

Impact N-3: Potential for annoyance.

The criteria for vibration-induced annoyance are significantly lower than the criteria to assess cosmetic cracking. Construction vibration would be expected to exceed the criteria at a distance of 250 feet (in case of pavement breaker) and at 150 feet during dynamic soil compaction.

Dump trucks are expected to exceed the criterion for annoyance on Category 2 receptors at a distance of 75 feet from the closest track centerline. Therefore, it would be important to provide a route for hauling material away from the construction site that would cause the least amount of impacts.

All vibration-induced impacts caused by construction activities would be temporary. Depending on the schedule expected to complete each task, the amplitude of vibration would change over time, and move throughout the proposed alignment as construction activities progress.

Appendix C presents the projected vibration during construction at the location of sensitive receptors. Two office buildings, one multi-family building, two hotels, and one church in the area of Sacramento would be exposed to temporary vibration-induced impact (annoyance) due to construction of the proposed project. For the portion of the alignment along West Sacramento, temporary vibration impact would be expected to exceed the threshold of annoyance at eight hotels, one college, the Center for Spiritual Awareness, and at the West Sacramento City Hall.

Mitigation. To avoid vibration-induced annoyance impacts due to construction activities, the activities should be kept below the impact criteria (Table 4-12). The contractor will select equipment and methods to reduce the potential for annoyance. Possible mitigation strategies include:

- Avoid the use of pavement breakers. Instead, use a hoe ram with hydraulic chisel.
- Avoid the use of dynamic compaction at a distance closer than 25 feet from any sensitive receptors, or use alternative methods of compaction in areas of construction that would be closer than 25 feet from sensitive receptors.
- Monitor vibration during construction to ensure compliance with criteria for building damage for buildings within 40 feet of construction activities. Conduct a preconstruction crack survey of these buildings.
- Plan routes for hauling material out of the proposed project site that would cause the least impact (annoyance). Propose truck routes along roads where the sensitive receptors are at least 75 feet from the street centerline.

Determination. By employing the mitigation measures described above, the vibration annoyance impacts created by construction activities would be less than significant.

Operations Noise Impacts

Impact N-4: Potential to generate noise from streetcar operations.

Based on the screening distance procedure, the potential for noise impact has been estimated for sensitive receptors located within 260 feet of the proposed alignment.

The impact assessment for noise is based on the comparison of the increased levels (L_{dn} or L_{eq}) associated with streetcar operations with the impact threshold. *Severe Impacts* would require noise control unless there are no practical means to do so. At the level of *Moderate Impact*, other considerations such as the increase in noise levels associated with the proposed project were evaluated to consider noise control measures.

Table 4-14 shows the results of the projected wayside noise levels from streetcar operation along the proposed alignment without noise control measures. A brief discussion of the potential noise impacts is presented below.

Table 4-14. Summary of Total (Existing + Ambient) Noise Levels for the Downtown/Riverfront Streetcar Project

Station	Location	Land Use	Side of Track	Speed (mph)	Dist. to nearest track cL (ft)	Amb. Level L _{dn} /L _{eq}	FTA Criteria		Total Noise Levels – No Noise Control				Total Noise Levels – With Noise Control ⁽²⁾			
							Moderate Impact	Severe Impact	Project L _{dn} (dBA)	Increase (dBA)	Imp. Type	# of Bldgs with Imp.	Project L _{dn} (dBA)	Increase (dBA)	Imp. Type	# of Bldgs with Imp.
City of Sacramento																
-- (1)	Hotel Marshall – 1122 7th Street	Hotel	SB	13	40	75	0.41	2.20	75	0.0	NI	0	75	0.0	NI	0
-- (1)	Berry Hotel – 729 L Street	Hotel	NB	13	23	75	0.41	2.20	75	0.0	NI	0	75	0.0	NI	0
-- (1)	Mix res/com L and 8th Street	MF	EB	13	50	75	0.41	2.20	75	0.0	NI	0	75	0.0	NI	0
-- (1)	Cathedral of the Blessed Sacramento	Church	EB	13	40	72	2.12	5.40	72	0.0	NI	0	72	0.0	NI	0
118+00	The Cathedral Bldg – K Street	Office/MF	EB	13	40 xo	72	0.80	2.50	74	1.9	MI	0	74	1.9	MI	0
126+00	Sheraton Grand -1230 J Street	Hotel	NB	13	200	68	1.17	3.07	71	2.8	MI	0	71	2.8	MI	0
134+00 to 136+40	St. Paul Episcopal Church	Church	SB	13	30	69	2.82	6.04	80	10.9	SI	1	69	0.1	NI	0
135+00	Sacramento Memorial Auditorium	Audit.	SB	13	110	69	1.10	2.91	74	5.2	SI	1	69	0.0	NI	0
135+00 to 137+00	Maydestone (Abandoned)	MF	SB	13	30	69	1.10	2.91	78	9.5	SI	1	69	0.1	NI	0
137+00 to 139+00	Capitol Center – 1515 K Street	Office	SB	13	35	69	2.82	6.04	69	0.1	NI	0	69	0.1	NI	0
142+00	Residence Inn by Marriott 1501 L Street	Hotel	SB	13	30	69	1.10	2.91	78	9.5	SI	1	69	0.1	NI	0
151+00 to 155+00	Hyatt Regency – 1209 L Street	Hotel	NB	13	45	66	1.32	3.44	75	9.0	SI	1	66	0.16	NI	0
147+00 to 153+50	Sacramento Community Center – 1301 L Street	C. C.	NB	13	40	65	3.44	7.13	76	10.8	SI	1	65	0.1	NI	0
74+00 to 86+00	Office Bldgs along Capitol Mall	Office	NB/SB	20	75	68	2.95	6.28	68	0.1	NI	0	68	0.1	NI	0
66+00	Embassy Suites Hotel – 100 Capitol Mall	Hotel	EB	20	100 xo	67	1.24	3.25	68	0.7	NI	0	67	0.2	NI	0

Table 4-14. Summary of Total (Existing + Ambient) Noise Levels for the Downtown/Riverfront Streetcar Project (Continued)

Station	Location	Land Use	Side of Track	Speed (mph)	Dist. to nearest track cL (ft)	Amb. Level L _{dn} / L _{eq}	FTA Criteria		Total Noise Levels – No Noise Control				Total Noise Levels – With Noise Control ⁽²⁾			
							Moderate Impact	Severe Impact	Project L _{dn} (dBA)	Increase (dBA)	Imp. Type	# of Bldgs with Imp.	Project L _{dn} (dBA)	Increase (dBA)	Imp. Type	# of Bldgs with Imp.
City of West Sacramento																
13+00	West Sacramento City Hall	Office	WB	20	90	67	3.10	6.55	67	0.2	NI	0	67	0.2	NI	0
13+00 to 16+50	Future Los Rios Community College	School	EB	20	70	67	3.10	6.55	67	0.2	NI	0	67	0.2	NI	0
18+00	Silvey's Motel 1030 W Capitol Ave	Hotel	WB	20	70	67	1.32	3.44	66	0.3	NI	0	66	0.3	NI	0
18+00 to 24+50	Center for Spiritual Awareness 1020 W. Capitol Ave	Church	EB	20	60	67	1.24	3.25	67	0.3	NI	0	67	0.3	NI	0
26+00	Budget Motel – 964 W. Capitol Ave	Hotel	WB	20	60	66	1.32	3.44	66	0.4	NI	0	66	0.4	NI	0
26+00	Old Town Inn	Hotel	WB	20	80	65	1.41	3.65	76	10.9	SI	1	69	3.6	MI	0
25+00 to 30+00	Rodeway Inn Capitol	SF	EB	20	95	65	1.41	3.65	71	5.9	SI	1	67	1.7	MI	0
31+50	The Ironworks	Hotel	EB	20	220	67	1.24	3.25	70	3.3	SI	8	68	0.9	NI	0
44+00 to 50+00	(New) Washington Street Residential Project	MF	EB	20	70	67	1.24	3.25	67	0.3	NI	0	67	0.3	NI	0
52+00 to 57+00	(New) River 1 Mixed Residential., Retail, Hotel Project	MF	EB	20	80 xo	67	1.24	3.25	69	1.7	MI	0	69	1.7	MI	0

Notes:

¹ Alignment shared with the existing Gold/Blue Line

² Upper range represents the potential noise from rehabilitated cars moving through tight curves

SB: Southbound

NB: Northbound

EB : Eastbound

WB: Westbound

SF: Single-family building

MF: Multi-family building

CC: Community Center

xo: Crossover switch

NI : No Impact

MI : Moderate Impact

SI : Severe Impact

Sacramento

Operations of the proposed project would exceed the threshold for *Severe Impact* at six buildings and *Moderate Impact* at one building. Buildings with *Severe Impact* would primarily be located at the easternmost end of the proposed alignment. Specifically, noise impacts would be expected in the proximity of the track loop around the Convention Center at two hotel buildings, one multi-family building (currently abandoned), one church, the Sacramento Memorial Auditorium, and the Community Center located at 1301 L Street. One hotel would experience a *Moderate Impact* with a noise increase less than 5 dBA, and no noise control would be required for this building. The main reason for noise impact is the potential increase due to wheel squeal on the curves with radii from 60 to 105 feet proposed for the loop around the Convention Center. Noise from streetcar operations on tangent tracks would be below the threshold for *Moderate Impact* and, therefore, would generate no significant impact.

West Sacramento

The project noise would exceed the FTA criterion for *Severe Impact* at several buildings. Of these buildings, the potential for wheel squeal noise is the main cause of noise impact at two hotel buildings (Old Town Inn and Rodeway Inn); for planned residential projects along West Capitol Avenue; and at a group of multi-family residences at the Ironworks residential project (currently under construction), with an estimate of 8 residences exposed to *Severe Impact* (see Table 4-14). Wayside noise levels at the storage track immediately west of the West Sacramento Civic Center station would be expected to increase the existing ambient levels by 1.2 to 1.9 dBA. This increase is not sufficient to affect nearby sensitive receptors, West Sacramento City Hall, or the future Los Rios Community College.

Streetcar operations would generate *Moderate Impact* at the new River 1 mixed residential project due to the crossover switch proposed in the area. However, the increase in noise levels would be less than 2 dBA, and consequently noise control measures would not be required.

Impacts would occur on noise sensitive receptors near tight curves, but not on tangent tracks.

Mitigation. Resilient wheels or suitable equivalent noise control measures are expected to reduce up to 10 dBA of the noise increase associated with squeal wheel. Combined with the use of rail lubrication, wheel squeal will likely be reduced further. A reduction of 15 or 20 dBA may be possible.

Determination. With the mitigation described above, wheel squeal impacts would be reduced to a less than significant level.

Impact N-5: Potential noise from substation operation.

Noise from power substations would result in a noise impact if substations are at distance within 230 feet from any noise sensitive receptor such as a residence, hotel, or church. At the intersection of Tower Bridge Gateway and Garden Street are located a motel and existing, as well as planned, residential development. All are considered sensitive receptors that would be affected by substation noise.

Mitigation. To alleviate noise impacts from substation operation, any of the following mitigation strategies could be employed:

- Locate power stations at a distance farther than the screening distance determined in this analysis from noise sensitive receptors.
- Re-evaluate the inside buffer during engineering design and, if necessary, install efficient enclosures to meet local noise threshold criteria.
- Place power stations in underground utility vaults.

Determination. With any of the mitigation measures described above, substation noise impacts would be less than significant.

Operations Vibration Impacts

Impact N-6: Potential vibration impacts generated by streetcar operation.

Operation of the streetcar is expected to produce GBV levels that would be below the FTA criterion for either residential or institutional land uses near the streetcar alignment. For the portion of the alignment within the City of Sacramento, vibration levels would be on the order of 51 VdB to 62 VdB along tangent track (depending on the distance of the alignment to sensitive receptors), which is 21 to 10 VdB below the FTA criteria. Near special trackwork (turnouts and crossovers), vibration levels at receptors would be as high as 70 to 71 VdB, due to the increase in GBV level associated with the gap at the switch. Even so, these levels would still be 4 to 5 VdB below the FTA criterion. Within the City of West Sacramento, the projected GBV levels are expected to range from 55 to 71 VdB at sensitive receptors. The highest vibration levels would be generated along West Capitol Avenue, where receptors would be between 60 and 80 feet from the alignment tracks. However, these vibration levels would be below the FTA criteria by 1 to 8 VdB. Consequently, no vibration control would be required within West Sacramento.

A summary of operations-related GBV estimates at sensitive receptors is provided in Appendix C. In all cases, these levels are below the FTA criteria.

Similarly, vibration levels due to streetcar operations in maintenance and storage facilities would be below the criteria by 5 to 20 VdB.

Mitigation. No vibration control measure is required.

Determination. No vibration impacts are expected from streetcar operations in the study area or at the storage and maintenance facility.

Cumulative Impacts

Impact N-7: Potential to make a considerable contribution to cumulative noise in the study area.

The cumulative analysis compares the incremental increase in noise levels produced by the Streetcar Project Alternative compared with the future noise levels for the No-Project Alternative.

Sacramento

As indicated in Table 4-15, the noise environment for the No-Project Alternative would increase due to the anticipated increase in traffic volumes. Cumulative noise would be as much

Table 4-15. Projected Cumulative Noise Levels for the No-Project and Streetcar Project Alternatives

Station	Location	Land Use	Traffic Node ¹ Used	Exist Ambient Level L _{dn} /L _{eq}	No Build		Build Alternative			Noise Increase Build Over No-Build (dBA)
					Ambient L _{dn} /L _{eq}	Noise Increase Over Existing (dBA)	Ambient (Traffic only) L _{dn} /L _{eq}	Ambient (Traffic + LRT) L _{dn} /L _{eq}	Noise Increase Over Existing (dBA)	
Downtown Sacramento										
0	Hotel Marshall - 1122 7th Street	Hotel	4	75	81	6	81	81	6	0
0	Berry Hotel - 729 L Street	Hotel	5	75	81	6	81	81	6	0
0	Mix res/com L and 8th Street	Retail/Resid.	5	75	81	6	81	81	6	0
0	Cathedral of the Blessed Sacrament	Church	5,6 ²	72	75	3	75	75	3	0
118+00	The Cathedral Bldg - K Street	Office/R esid.	6	72	74	2	74	75	3	1
126+00	Sheraton Grand -1230 J Street	Hotel	7	68	69	1	69	69	1	0
134+00 to 136+40	St. Paul Episcopal Church	Church	9	69	71	2	70	71	2	0
135+00	Sacramento Memorial Auditorium	Aud.	9	69	71	2	70	70	1	-1
135+00 to 137+00	Maydestone (Abandoned)	Resid.	9	69	71	2	70	71	2	0
137+00 to 139+00	Capitol Center - 1515 K Street	Office	10	69	72	3	71	72	3	0
142+00	Residence Inn by Marriott 1501 L Street	Hotel	11	69	71	2	71	71	2	0
151+00 to 155+00	Hyatt Regency - 1209 L Street	Hotel	11	66	68	2	68	68	2	0
147+00 to 153+50	Sacramento Community Center - 1301 L Street	Conv. Center	11	65	67	2	67	67	2	0
74+00 to 86+00	Office Buildings along Capitol Mall	Office	3	68	73	5	73	73	5	0
66+00	Embassy Suites Hotel - 100 Capitol Mall	Hotel	2	67	72	5	72	72	5	0
West Sacramento										
13+00	West Sacramento City Hall	Office	2	67	72	5	72	72	5	0
13+00 to 16+50	Future Los Rios Community College	School	2	67	72	5	72	72	5	0
15+00	Arthur F. Turner Branch Yolo County Library - 1212 Merkly Ave	Lib	2	67	72	5	72	72	5	0
15+00	River City Apostolic Church - 1205 Merkly Avenue	Church	2	67	72	5	72	72	5	0

Table 4-15. Projected Cumulative Noise Levels for the No-Project and Streetcar Project Alternatives (Continued)

Station	Location	Land Use	Traffic Node ¹ Used	Exist Ambient Level L _{dn} /L _{eq}	No Build		Build Alternative			Noise Increase Build Over No-Build (dBA)
					Ambient L _{dn} /L _{eq}	Noise Increase Over Existing (dBA)	Ambient (Traffic only) L _{dn} /L _{eq}	Ambient (Traffic + LRT) L _{dn} /L _{eq}	Noise Increase Over Existing (dBA)	
18+00	Silvey's Motel 1030 W Capitol Ave	Hotel	2	66	71	5	71	71	5	0
18+00 to 24+50	Center for Spiritual Awareness 1020 W. Capitol Ave	Church	2	67	72	5	72	72	5	0
26+00	Budget Motel - 964 W. Capitol Ave	Hotel	2	66	71	5	71	71	5	0
26+00	Old Town Inn	Hotel	2	65	70	5	70	71	6	1
25+00 to 30+00	Rodeway Inn Capitol	Hotel	2	65	70	5	70	70	5	0
31+50	The Ironworks South side of 275	Resid.	2	67	72	5	72	72	5	0
44+00 to 50+00	(New) Washington Street Residential Project	Resid.	2	67	72	5	72	72	5	0
52+00 to 57+00	(New) River 1 Mixed Residential, Retail, Hotel Project	Hotel/ Res./ Retail	2	67	72	5	72	72	5	0

Notes:

- ¹ Node number used by Fehr & Peers on study intersection.
- ² Traffic estimated from average of nodes 5 and 6.

as 6 dBA higher than the existing ambient, and in most areas the community noise environments would remain consistent with the Sacramento Noise Element's *Conditionally Acceptable* designation. However, in the area of 7th Street and 8th Street, cumulative noise for 2035 would be *Clearly Unacceptable* due to the anticipated traffic increase. Streetcar operation would contribute 1 dBA or less to the future noise increase, which is not a substantial contribution to the future No-Project conditions and, therefore, is not a cumulative impact of the Streetcar Project Alternative.

West Sacramento

Similarly, along West Sacramento, noise sensitive receptors in the area of the proposed project are located in noise environments that are *Probably Feasible* according to the West Sacramento Noise Element. The No-Project Alternative would increase the existing noise environment due to changes in traffic volume to a level at the upper range of the *Probably Feasible* category for motel and hotel land uses. However, future community noise exposure for the No-Project Alternative would fall under the *Usually Not Feasible* category for some residential land uses, such as the Ironworks project. Streetcar operation would contribute 1 dBA or less to the future noise increase, which is not a substantial contribution to the future No-Project conditions.

The contribution of the proposed project to the cumulative noise increase in the study area would be 1 dBA or less in West Sacramento, which is not considered a substantial contribution to the future (2035) noise conditions and, therefore, is not a cumulative impact of the Streetcar Project Alternative.

Determination. Cumulative noise impacts due to project implementation are considered less than significant.

4.10 Biological Resources

4.10.1 Study Methods and Significance Criteria

Biological impacts are considered significant according to criteria listed below. Coordination with CDFG and USFWS are required to determine if the proposed project would have an impact on sensitive or special-status species or habitats, including wetlands.

Impacts are considered significant if the proposed project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS;
- Have a substantial adverse effect on federally-protected wetlands, as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means;

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.10.2 Impact Analysis

An analysis of biological impacts of the proposed project is detailed below.

4.10.2.1 No-Project Alternative

The No-Project Alternative would not implement the Streetcar Project Alternative, and changes to the street rights-of-way along the alignment would occur because of planned development. Landscape improvements are likely to be included as part of the development requirements or as adjunct street improvement projects done by the cities.

4.10.2.2 Streetcar Project Alternative

Construction and Operations Impacts

Impact BIO-1: Potential for streetcar construction or operation to have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species.

Project construction would occur in existing urban paved street right-of-ways or center dividers and would use the existing light rail track. No significant impacts were identified for any of the species listed in Table 3-27 or identified in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

Mitigation. No mitigation is required.

Determination. No special-status species or habitat impacts would be affected by construction.

Impact BIO-2: Potential to have a substantial adverse effect on any riparian habitat or other sensitive natural community.

By following the street right-of-way and/or being confined to the median of Capital Mall, no significant habitat would be removed. The proposed project would use the existing Tower Bridge to cross the Sacramento River. No construction activities would take place in riparian habitat or in any other natural community alongside the bridge. Construction activities would not conflict with local or regional plans, policies, regulations, or those identified by the CDFG or USFWS.

Mitigation. No mitigation is required.

Determination. No sensitive habitat exists within the study area. Therefore, no habitat impacts were identified.

Impact BIO-3: Potential to have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.

The proposed project would be implemented in developed and paved urban landscape that no longer has wetland habitat as defined by Section 404 of the CWA. There would be no direct removal, filling, or hydrological interruption along the proposed project alignment.

Mitigation. No mitigation is required.

Determination. No wetlands exist in the study area, so no wetland impacts were identified.

Impact BIO-4: Potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The proposed project would not interfere with the movement of any native resident or migratory fish or wildlife species, nor would the proposed project interfere with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Use of the existing Tower Bridge, surface streets, and the center divider would not interfere with the movement of native resident migratory fish and wildlife species.

Construction of the proposed project on the Tower Bridge would not have additional effects on fish migration, because no construction would occur in the Sacramento River. The CNDDB queries show the hoary bat using urban and residential habitat in West Sacramento. The CNDDB also shows purple martin and Cooper's hawk occurring in urban and residential habitat in Sacramento. Construction along the proposed project alignment would not have impacts on hoary bat, purple martins, and Cooper's hawks because the proposed project site does not contain suitable native wildlife nursery sites and would not impede migration.

Mitigation. No mitigation is required.

Determination. No significant impacts to the movement of native wildlife would be expected due to project implementation.

Impact BIO-5: Potential to displace swallow nests from the bridge in violation of the Migratory Bird Treaty Act.

Barn swallows, cliff swallows, and rock doves nest on the Tower Bridge. Barn swallows and cliff swallows are protected by the MBTA. If construction occurred on the Tower Bridge during the nesting season, displacement of barn swallows and cliff swallows nests could occur, a significant impact.

Mitigation. If construction activities on the Tower Bridge occur during the nesting season, impacts to nesting birds can be avoided by removing swallow nests prior to nest completion. Because swallows are persistent, continued monitoring and maintenance would be necessary to remove nests that are initiated, generally by use of a fire hose. No violation of the MBTA occurs if the nests or birds are not harmed. The practice is to remove old nests prior to nesting

season and then as the birds attempt to build new ones, remove them weekly (sometimes daily) before they are completed. In this manner, the birds are not harmed but no re-nesting occurs. Prior to construction and in consultation with USFWS and CDFG, all old nests would be removed from the bridge, and new nests would be prevented from being established through monitoring.

As an alternative, the project applicant could consult with the USFWS MBTA office (Portland, Oregon) and CDFG (Sacramento) to secure an agreement to allow construction to be implemented without removing nests preemptively. There is greater risk that one or more birds may abandon young or be injured. Because cliff swallows and barn swallows are not rare, the USFWS may allow construction without pre-emptive nest removal.

Determination. By employing the aforementioned mitigation strategies, impacts of the proposed project on nesting birds would be reduced to a less than significant level.

Impact BIO-6: Potential to have a conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

Since the proposed project would be constructed in the street right of way, across the Tower Bridge, and along the Capital Mall median, no trees would be affected by construction. If construction removed trees in the median of West Capitol Avenue at City Hall or along the K Street pedestrian mall between 12th Street and 13th Street, a significant impact on trees could result.

Mitigation. The project sponsor will follow the conditions of the City of West Sacramento requirements for replacing lost trees for development projects and the City of Sacramento Tree Preservation Ordinance for removal, construction around trees, and cutting and trimming heritage trees.

The City of West Sacramento's Tree Preservation Ordinance can be found in Chapter 8.24 of the City's Municipal Code. Heritage or landmark trees can be only removed by permit granted by the City's tree administrator and usually require the replacement of a living tree on the property or within the City in a location approved by the tree administrator. More specifically, replacement trees will be planted at the rate of 1-inch diameter of replacement plant for every 1-inch diameter of tree removed. In the event that the property owner is unable to replace the tree on his/her property or within an area approved by the tree administrator, the tree administrator would require the property owner to pay an in-lieu fee to the city. However, if a tree is in need of removal solely because it poses a risk to persons or property or if the tree acts as a host for a plant that is parasitic, a replacement tree or in-lieu fee would not be required.

If a non-heritage, non-landmark street tree is being removed, the ordinance stipulates that the replacement tree should be of a size and species pursuant to the City of West Sacramento's Landscape Development Guidelines.

The City of Sacramento's Tree Preservation Ordinance is included in Section 12.56.090 of its Municipal Code. Removal of a tree is granted by the Director of the City's Department of Parks and Recreation, usually with the condition that a replacement tree would be planted in a location determined by the City. Generally, if the tree being removed is 6 inches or larger in diameter, measured 4.5 feet above ground, then the replacement would need to be at least 24-inch box size. If the city street tree being removed is smaller than 6 inches in diameter,

measured 4.5 feet above ground, then the replacement tree would be a minimum of 15-gallon can size.

Determination. By following local requirements, tree removal would be mitigated to a less than significant level.

Impact BIO-7: Potential to have a conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The proposed project would not conflict with a known adopted Habitat Conservation Plan, Natural Community Conservation Plan, or local, regional, or state habitat conservation plan.

Mitigation. No mitigation is required.

Determination. No significant impacts to conservation plans are anticipated.

4.11 Hydrology and Water Quality

4.11.1 Study Methods and Significance Criteria

Impacts to hydrology and water quality are considered significant if the proposed project would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or offsite;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100 year flood hazard area as mapped on a federal Flood Hazard Boundary, FIRM, or other flood hazard delineation map;
- Place within a 100 year flood hazard area structures which would impede or redirect flood flows;

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or,
- Inundation by seiche, tsunami, or mudflow.

4.11.2 Impact Analysis

The significance criteria are applied to and compared with the potential impacts of the proposed project and the No-Project Alternative.

4.11.2.1 No-Project Alternative

Because the No-Project Alternative would not implement the Streetcar Project Alternative, no water resource impacts would occur. Planned roadway or transit improvements programmed in the SACOG 2035 MTP would include mitigation measures that would reduce potentially significant water resources impacts to a less than significant level, as required. Similarly, planned development in the study area would incorporate Best Management Practices (BMPs) to address run-off and to maintain water quality.

4.11.2.2 Streetcar Project Alternative

Construction Impacts

Impact HYDRO-1: Potential to reduce surface water quality during construction.

Construction activities could temporarily disturb the existing drainage patterns and alter the amount of impervious area, potentially loosening sediment on roadways along the proposed streetcar alignment. Land clearing and/or grading activities would temporarily increase the potential for soil erosion, and could thereby cause an increase in suspended solids in runoff and local receiving waters. In addition to potential impacts from erosion, impacts to runoff water quality during construction could potentially result from leaks or spills of fuel or hydraulic fluid used in construction equipment; outdoor storage of construction materials; or spills of paints, solvents, or other potentially hazardous materials commonly used in construction.

Mitigation. A preliminary grading and erosion control plan for the proposed project would be submitted to the appropriate city for approval prior to issuance of a grading permit in the city. The BMPs to be implemented during construction to minimize discharge of sediments offsite would be included in the erosion control plan. Sediment generated by demolition, grading, or construction activities for the proposed project would be contained on the construction site and controlled using BMPs. Upon completion of the proposed project, the proposed project area would be covered with impervious surfaces, resulting in negligible sediment production. BMPs that could be implemented during construction include, but are not limited to, silt fences, sand bags, fiber rolls, and a stabilized construction entrance. Final grading plans would include all proposed grading, drainage improvements, vegetation, and tree removal. Final grading and erosion control plans would be prepared during design in accordance with the provisions of Yolo County, the County of Sacramento, and the cities of West Sacramento and Sacramento and submitted to the appropriate city for approval prior to construction.

Construction activities involving the disturbance of one or more acres apply for coverage under the SWRCB's NPDES General Permit for Stormwater Discharges Associated with Construction Activities. To obtain coverage under the permit, the project sponsor would submit a Notice of Intent with the required permit fee and prepare a project-specific SWPPP. The SWPPP will include development of site-specific structural and operational BMPs to

prevent and control impacts to runoff quality, measures to be implemented before each storm event, inspection and maintenance of BMPs, and monitoring of runoff quality by visual and/or analytical means. The RWQCB will issue waste discharge requirements that set forth conditions, discharge limitations, and monitoring and inspection requirements with which the cities of West Sacramento and Sacramento will comply. The contents of the SWPPP are set forth in detail in the permit application package. The California Stormwater BMP Handbook for Construction (CASQA, 2003) also provides examples of BMPs that could be used, including the following:

- Scheduling materials deliveries to provide for minimal onsite storage and/or providing covered storage for materials wherever practical;
- Designating specific areas for overnight construction equipment storage and maintenance, and providing runoff control around those areas to minimize the potential for runoff to contact spilled materials;
- Procedures for daily worksite cleanup and immediate cleanup of spilled materials and contaminated soil;
- A program of site inspections to ensure that BMPs are consistently implemented and effective;
- Visual monitoring of onsite runoff quality;
- Applying hydroseeding or hydromulching to stabilize disturbed areas, as appropriate;
- Placing fiber rolls around drain inlets or providing other storm drain inlet protection measures to prevent sediment and construction-related debris from entering the inlets;
- Placing fiber rolls along the perimeter of the site to reduce runoff flow velocities and prevent sediment from leaving the site, and placing sandbags around potentially affected offsite inlets to prevent sediments from entering the inlets;
- Constructing sedimentation basins to collect and temporarily detain stormwater runoff to allow sediment to settle prior to discharge;
- Providing stabilized construction access to minimize the tracking of mud and dirt onto public roads;
- Providing equipment tire wash and cleaning area to prevent the tracking of mud and dirt onto public roads;
- Managing stockpiles and materials by stabilizing stockpiles, placing stockpiles away from drainages, and protecting stockpiles with fiber rolls;
- Placing silt fences downgradient of disturbed areas to slow down runoff and retain sediment; and

- Specifying that all disturbed soil will be seeded, mulched, or otherwise protected by October 15.

The preparation and implementation of a SWPPP that addresses maintenance and inspection of BMPs, including monitoring and reporting, to ensure the effectiveness of the BMPs in protecting water quality, would be prepared.

Determination. Implementation of the aforementioned mitigation measures would reduce significant impacts to water quality due to construction activities of the proposed project to a less than significant level.

Operations Impacts

Impact HYDRO-2: Potential to reduce water quality during operation.

The increase in the overall amount of impervious surface as a result of the proposed project would be negligible. Following construction of the proposed project, stormwater runoff quality would be expected to remain the same as pre-construction conditions, because the roadway would resume normal operation. The road would continue to serve automobile traffic after project completion, with the addition of streetcar traffic. The streetcars would not increase the oils and grease expected on impervious areas, because they would be electrically powered. The pavement removed during construction would be replaced with impervious cover whether repaved or converted to a platform at project completion; therefore, erosion and sedimentation would not be increased.

A portion of the proposed project site drains into the Sacramento River. Currently, the Sacramento River is considered an impaired water body, with high levels of mercury near the proposed project (CVRWQCB, 2006). The implementation of a streetcar route will not contribute to the mercury levels in the Sacramento River.

Mitigation. No mitigation is required.

Determination. The proposed project would not reduce water quality. Therefore, the impact would be less than significant.

Impact HYDRO-3: Potential to deplete groundwater supplies.

The proposed project would not deplete groundwater supplies. The groundwater depths in the proposed project area range from approximately 10 to 35 feet below ground surface (CSC, 2006; YCFCWCD, 1996; and Topozone.com, 1999-2007). The installation of project features, tracks, and platforms would not require disturbance of the ground surface to these depths; therefore, groundwater dewatering during construction activities would not be anticipated. The proposed project does not require a water supply for operations and there would be no groundwater extraction associated with the proposed project.

Mitigation. No mitigation is required.

Determination. The proposed project would not deplete groundwater. Therefore, the impact would be less than significant.

Impact HYDRO-4: Potential to reduce groundwater recharge.

The proposed project would not disturb any existing wells or significantly change the infiltration rate at the proposed project site. Because land usage and the amount of impervious area would remain nearly identical to pre-construction conditions, the amount of water infiltrating into the ground would be approximately the same after project construction is completed.

Mitigation. None required.

Determination. The proposed project would not reduce groundwater recharge. Therefore, the impact would be less than significant.

Impact HYDRO-5: Potential to increase in runoff rate downstream of the site.

The installation of streetcar tracks and platforms would not substantially alter drainage patterns nor result in a significant increase in impervious surfaces. The proposed project features would be on existing roadways, so the new surfaces would replace existing impervious surfaces at similar slopes. The final grading after construction would be similar to pre-construction grading; therefore, there would be no change in drainage patterns that could increase runoff to downstream areas. The rate at which water infiltrates over the proposed project area and the runoff rate downstream would be similar to pre-construction conditions after project completion.

Mitigation. No mitigation is required.

Determination. The proposed project would not increase runoff rate downstream. Therefore, the impact would be less than significant.

Impact HYDRO-6: Potential to increase runoff volume downstream of the site.

The installation of streetcar tracks and platforms would not result in a significant increase in the volume of runoff leaving the site, if any. The proposed project features would be on existing roadways, so the impervious area would remain the same after construction. The pavement removed during construction would be replaced with impervious cover whether repaved or converted to a platform at project completion. Therefore, the rate at which water infiltrates over the proposed project area and the resulting volume of runoff from the site would be similar to pre-construction conditions after the proposed project is complete.

Mitigation. No mitigation is required.

Determination. The proposed project would not increase runoff volume downstream. Therefore, the impact would be less than significant.

Impact HYDRO-7: Potential to exceed drainage capacity.

The proposed project is not anticipated to substantially alter drainage patterns or runoff volume after completion. Existing roadways will be repaved, regraded, and restored to pre-construction conditions with the addition of streetcar tracks and platforms. No additional sources of runoff would be created. Therefore, existing drainage facilities (e.g., catch basins and gutters) are anticipated to have sufficient capacity after project completion.

Mitigation. No mitigation is required.

Determination. The proposed project would not exceed drainage capacity. Therefore, the impact would be less than significant.

Impact HYDRO-8: Potential for placement of fill or structures in the 100-year floodplain.

Although a portion of the proposed project area is in the 100-year floodplain, no additional fill or structures are anticipated because of the proposed project. The substation locations at Tower Bridge Gateway/Garden Street are protected from 100-year flooding (FEMA, 1995). The streetcar track and platforms would be on existing roadways, so impacts from flooding are not anticipated.

Mitigation. No mitigation is required.

Determination. The proposed project would not take place in or disrupt the 100-year floodplain. Therefore, the impact would be less than significant.

Impact HYDRO-9: Potential to increase risk to human and structural safety during flooding.

Since the streets along the proposed alignment are protected from the 100-year flood (FEMA, 1995 and 2007), the installation of streetcar tracks and platforms to existing roadways and across the Tower Bridge would not increase the risk to human or structural safety during flooding in spite of its potential to attract more pedestrian usage of the streets. The FEMA 100 year floodplain would not be altered because of the proposed project. Although the proposed project site includes existing levees, the proposed project would not alter existing levees. As discussed in Section 3.11, failure of the Folsom Dam would result in flooding in the proposed project area; however, the risk of dam failure is low and unaffected by the proposed project. The flooding because of dam or levee failure would not be altered after the completion of the proposed project. Therefore, the risk of human and structural safety due to flooding because of dam or levee failure would not change due to the proposed project.

Mitigation. No mitigation is required.

Determination. The proposed project would not increase risk to human or structural safety during flooding. Therefore, the impact would be less than significant.

Impact HYDRO-10: Potential to increase risk of inundation due to seiche, tsunami, or mudflow.

The proposed project is not near a body of water subject to seiches or tsunamis. The proposed project location has a very low potential for inundation by mudflow. The banks of levees have the potential to landslide; however, the proposed project would not alter the levees. The proposed project location would be subject to the same risk to mudflow as pre-construction conditions. No increase in risk of inundation from seiche, tsunami, or mudflow would occur.

Mitigation. No mitigation is required.

Determination. No inundation impact would occur.

Cumulative Impacts

Hydrologic impacts from the proposed project are overall less than significant. Because of the proposed project location in the street right-of-way, the impacts of the proposed project are not anticipated to contribute to cumulative impacts with other development projects in the area, which will be required to use BMPs in addressing runoff and water quality issues.

4.12 Geology and Soils

4.12.1 Study Methods and Significance Criteria

This section identifies and discusses the impacts to geology and soils resulting from the proposed project, and suggests mitigation measures to reduce the level of impact.

Potentially significant impacts associated with soils, geology, and seismicity have been evaluated using the following criteria:

- Substantial alteration of existing topographic features of the alignment;
- Potential constraints to development because of seismic hazards within the study area;
- Increased erosion during construction activities and following completion of the proposed project;
- Loss of availability of important mineral resources; and
- Potential constraints to development because of soils and geologic conditions in the area of the proposed project.

4.12.2 Impact Analysis

4.12.2.1 No-Project Alternative

The No-Project Alternative would retain existing conditions with planned roadway improvements for Tower Bridge Gateway and surrounding redevelopment projects undertaken using BMPs for addressing grading, soil, and seismicity issues.

4.12.2.2 Streetcar Project Alternative

Construction Impacts

Impact GEO-1: Potential for topographic alteration resulting from earth grading.

The only grading anticipated for the proposed project would be an excavation of approximately 3 feet along Tower Bridge Gateway under the UPRR overcrossing between 5th Street and Garden Street. This would be necessary to meet CPUC clearance requirements in the event that a waiver is not obtained from the CPUC. An excavation of this magnitude would not constitute substantial alteration of topographic features.

Mitigation. No mitigation is required.

Determination. An excavation of this magnitude would not constitute substantial alteration of topographic features and would, therefore, not be a significant impact.

Impact GEO-2: Potential for increased erosion during construction and following completion.

The proposed project site is essentially flat and construction would be conducted using BMPs in accordance with an approved SWPPP. Therefore, more stringent mitigation measures would not be required.

Mitigation. No mitigation is required.

Determination: Increased erosion from project construction is not anticipated. Therefore, no impacts are anticipated.

Impact GEO-3: Potential loss of availability of important mineral resources.

As noted in Section 3.12.2, no significant mineral resources are within the proposed project area. Accordingly, no impacts would occur.

Mitigation. No mitigation measures are required.

Determination: No mineral resources would be affected by the proposed project, because they do not occur within the study area.

Impact GEO-4: Potential constraints due to soils and geologic conditions.

No unusual soils or geologic conditions are known within the proposed project area, and the proposed project would be constructed in accordance with standard design and construction practice. No impacts are anticipated.

Mitigation. No mitigation measures are required or proposed.

Determination. Constraints from soils and geology erosion are not anticipated. Therefore, no impacts from the proposed project are anticipated.

Operation and Cumulative Impacts**Impact GEO-5: Potential constraints due to seismic hazards.**

As indicated in Section 3.12.2, the proposed project site is in a seismically quiescent area and no active faults are known to exist in its vicinity. Accordingly, the potential for ground displacement due to surface faulting is considered negligible. Nevertheless, future earthquakes could result in liquefaction and lateral spreading failures, particularly near the Sacramento River, if subsurface conditions such as soil grain size distribution, in-place density, and water table permit. Because liquefaction susceptibility would normally be evaluated during geotechnical investigations for proposed development, a specific mitigation measure does not seem appropriate in this instance. Similarly, structural improvements to the Sacramento River levee and BMPs for roadway construction along the proposed alignment would minimize the effects of ground movement on the alignment, providing a cumulative benefit for the proposed project and the study area.

Mitigation. No mitigation is required.

Determination. No operation or cumulative impacts on geologic or seismic conditions are anticipated with implementation of the proposed project.

4.13 Hazardous Materials

4.13.1 Study Methods and Significance Criteria

The following environmental significance criteria are based on criteria developed in accordance with the requirements of CEQA. Impacts would occur if the alternatives were to:

- Create a hazard to the public or the environment through the routine use, generation, transport, or disposal of hazardous materials or wastes;
- Create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials or wastes into the environment; or
- Expose people or the environment to contaminants in soil, groundwater, sediments, or structures slated for demolition.

For the significant impacts identified, mitigation measures were developed to decrease the potential impacts.

4.13.2 Impact Analysis

4.13.2.1 No-Project Alternative

The No-Project Alternative would not implement the Streetcar Project Alternative, but construction for planned street improvements and planned development may encounter hazardous materials that would be addressed according to state guidelines and local ordinances.

4.13.2.2 Streetcar Project Alternative

Construction Impacts

Impact HAZ-1: Potential for the use and storage of minor amounts of hazardous materials and the generation of small quantities of hazardous waste including, but not limited to, storage of fuels, cleaners, and paints and generation of waste oil due to construction activities.

The impact on the public or the environment through the routine use, generation, transport, or disposal of hazardous materials or wastes associated with construction activities is considered less than significant, since the likelihood of encountering substantial quantities of hazardous materials during construction is minimal. The construction contractor would be responsible for the proper storage and disposal of any hazardous materials or wastes in accordance with all federal, state, and local laws and regulations. This may involve obtaining permits from the local regulatory agency for the storage of hazardous materials, and a Waste Generators Identification Number from the state for the disposal of any hazardous wastes generated at the site.

Mitigation. No mitigation is required.

Determination. No significant impacts would be generated through use or disposal of hazardous materials during project construction.

Impact HAZ-2: Potential to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials or wastes into the environment due to construction activities.

Accidental spills or releases of hazardous materials during construction of the proposed streetcar alignment could potentially create a hazard to the public or the environment. This is considered a potentially significant impact.

Mitigation. Accidental spills or releases of hazardous materials such as fuels and oils from equipment may occur during construction activities. To mitigate potential impacts from an accidental release, an Emergency Response Plan will be prepared to address the procedures to be followed in the event of an accidental spill/release of hazardous materials. These procedures will include those required for agency notification should the release exceed the reportable quantity for the substance released and procedures to follow to contain and clean up the release.

Determination. With implementation of the aforementioned mitigation measure, the potential impact would be less than significant.

Impact HAZ-3: Potential to expose people or the environment to contaminants in soil, groundwater, sediments, or structures slated for demolition due to construction activities.

The proposed project has been designed to incorporate the streetcar into the existing built environment by installing the streetcar tracks within the existing roadway. It is anticipated that only shallow excavations would be required for construction. However, there may be areas where excavations would be deeper to remove soil with poor strength properties. Based on the environmental database review, there is the potential that contaminated soil and possibly groundwater (if deeper excavations are required for some construction requirements) may be encountered during construction activities for the proposed project. As such, the construction of the proposed streetcar alignment could potentially expose people or the environment to contaminants in soil and groundwater. This is considered a potentially significant impact.

Mitigation. To mitigate any potential impacts from exposure to contaminated soil and/or groundwater, a soil and groundwater management plan will be prepared for the proposed project. This plan would provide detailed procedures to be followed in the event that contaminated materials are encountered. The plan will detail procedures for the notification of appropriate regulatory agencies as well as procedures for the proper handling, storage, and disposal of contaminated materials.

Determination. With implementation of the mitigation measure, the potential impact would be reduced to a less than significant level.

Operation and Cumulative Impacts

Impact HAZ-4: Potential to create a hazard to the public or the environment through the routine use, generation, transport, or disposal of hazardous materials or wastes due to project operations.

The proposed project would share existing light rail storage and maintenance facilities with RT vehicles at the Academy Way light rail facility. Major alteration of the maintenance facility would not be required to maintain the streetcar fleet. Although the storage and use of some hazardous materials and the generation of hazardous wastes may increase, operation of the maintenance

facility with respect to how hazardous materials are stored, handled, and disposed would not change significantly.

Mitigation. No mitigation would be required.

Determination. The impact on the public or the environment through routine transport, use, or disposal of hazardous materials for the project would be considered less than significant.

Impact HAZ-5: Potential to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials or wastes into the environment due to project operations.

The streetcars proposed for use are electrically powered. Due to the lack of fossil fuel, there is little chance for release of hazardous materials or wastes into the environment due to an upset or accident condition.

Mitigation. No mitigation would be required.

Determination. The potential impact on the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials or wastes into the environment would be considered less than significant.

4.14 Utilities and Energy

4.14.1 Utilities Impact Analysis

4.14.1.1 Study Methods and Significance Criteria

For the purposes of this EIR, utility impacts are considered significant if the Streetcar Project Alternative or No-Project Alternative would result in the following:

- The project infrastructure would need to occupy the same space as an existing (or proposed) utility or access structure;
- The utilities cross under or over the proposed project (Roth, 2006);
- Conflict with the wastewater treatment requirements of the Central Valley Regional Water Quality Control Board; or
- Require construction of new storm water drainage facilities or if there were not sufficient water, wastewater treatment or landfill facilities available to serve the needs of the proposed project.

4.14.1.2 No-Project Alternative

The No-Project Alternative would not require modifications to utility lines. No utility impacts would occur beyond those planned for street improvements associated with development projects. Standard mitigation procedures for disrupting or displacing utility lines would be employed.

4.14.1.3 Streetcar Project Alternative

Construction and Operation Impacts

Impact UT-1: Potential to disrupt or conflict with existing utility lines and services.

Portions of the proposed project alignment are anticipated to cross over underground utilities within the public right-of-way. These possible utility conflicts and approximate locations are described below.

- From the West Sacramento Civic Center Terminal to the West Capitol/Merkley intersection, the proposed project alignment may cross over a water line, storm drains, telecommunication lines, and conflict with a traffic signal pole.
- From the West Capitol/Merkley intersection to the Garden/West Capitol intersection the proposed project alignment may cross over a water line, sanitary sewer, gas line, storm drain, and AT&T fiber optic.
- From Garden Street to Tower Bridge Gateway the proposed project alignment may cross over a sanitary sewer, storm drain, and storm drain manhole.
- From Tower Bridge Gateway to 5th Street the proposed project alignment may cross over a storm drain, water line, AT&T fiber optic, Level 3 Communication fiber optic, and gas line.
- From Tower Bridge Gateway, 5th Street to 3rd Street no conflicts with utilities are anticipated as there are no private utilities within this area.
- From 3rd Street/Tower Bridge Gateway intersection to the Tower Bridge, the proposed project alignment may cross over water line, storm drain, gas line, and Kinder Morgan Petroleum Pipeline.
- From east of 3rd Street the proposed project alignment may cross over a storm drain and gas line.
- Along the Tower Bridge, no conflicts with utilities are anticipated, as there are no utilities on the bridge.
- At the Front Street/Capitol Mall intersection, the proposed project alignment may cross over a water line, Sacramento Municipal Utility District electric line, and sanitary sewer.
- At the Capitol Mall Median between 7th and 8th Streets, the proposed project alignment may cross a utility tunnel.

The proposed project is anticipated to accommodate access and maintenance requirements into the project design whenever possible, to allow for greatest flexibility during project construction and operation. For example, the shallow depth of track construction and use of embedded track would prevent disruption during construction and would allow access to utility lines located directly beneath the trackbed through shallow excavation. Existing manholes in conflict with the track slab would be replaced by offset manholes as part of the project. As a result, no long-term disruption to

service or relocation of utility lines is expected to occur. Temporary utility conflicts would be mitigated as indicated below.

Mitigation. Coordination and consultation with utility agencies would occur during the final design phase. In addition, the contractor would coordinate with the Cities of Sacramento and West Sacramento to ensure that the construction of nearby utility projects would not be affected or delayed. Any disruption to utility service due to streetcar construction would be negotiated with the utility agencies and conducted at times to minimize the inconvenience to utility customers. Utilities that interfere with construction activities and need to be relocated would be coordinated with the utility and become a responsibility of the project sponsor.

Determination. With mitigation, utility impacts from the proposed project would be reduced to a less than significant level.

Impact UT-2: Potential of stray current from streetcar operation to affect metallic pipelines located near the alignment.

Stray current from operation of the electric-powered streetcar could induce corrosion on underground pipelines if those pipelines, such as older metallic pipelines in downtown Sacramento, are not protected.

Mitigation. The metallic pipes can be protected through multiple mitigation options, including pipe bonding, pipe coating, electrical isolation through use of an encapsulating dielectric isolation such as Rail Boot, creation of a low resistance stray current collector grid, design of traction power system and trackwork to minimize stray current, or test stations to confirm that stray current has been isolated. The most cost-effective strategy will be developed during final design to ensure this potential impact is mitigated.

Determination. By employing any of the mitigation options mentioned above, impacts of stray current on nearby utility pipelines would be less than significant.

4.14.2 Energy Impact Analysis

4.14.2.1 Study Methods and Significance Criteria

CEQA does not identify significance criteria for analysis of energy impacts. However, recent guidelines call for a discussion of potential energy use by the proposed project. For the purposes of this analysis, an energy impact is considered significant if the Streetcar Project Alternative or the No-Project Alternative would encourage activities that would result in large amounts of fuel, water, or energy or the use of these resources in a wasteful manner. The estimated energy consumption for each alternative is summarized below.

4.14.2.2 No-Project Alternative

The No-Project Alternative would result in increased diesel fuel and electric power consumption when compared to the current conditions because of growth in travel demand. Without the proposed project, more automobile trips would occur, which would result in increased energy consumption.

4.14.2.3 Streetcar Project Alternative

Construction and Operation Impacts

Impact UT-3: Potential to consume substantially more energy during construction and operation of the Streetcar Project Alternative than the No-Project Alternative.

Implementation of the proposed project would require electric power and substations to feed the catenary system and energy to power construction equipment. The energy used during construction would be temporary and limited to specific construction activities.

The anticipated energy impact of operating the proposed project was determined using the assumptions listed below.

- Ten-minute headways for each train between 12:00 p.m. and 2:00 p.m.;
- Fifteen-minute headways between 6:00 a.m. and 12:00 p.m., and 2:00 p.m. and 12:00 a.m.;
- The RT light rail system operates at published schedules;
- The streetcars operate at rated passenger loadings and at maximum performance;
- All substations are in service at nominal voltages and ratings; and
- Regeneration is disabled.

It should be noted that the electricity for RT's light rail system is purchased through the Sacramento Municipal Utilities District (SMUD). SMUD produces approximately 50 percent of its own power and purchases the other 50 percent through long- and short-term contracts with other energy companies (RT, 2008b). SMUD-owned power generation comprises primarily fossil fuel generation plants, followed by hydroelectric power plants (SMUD, 2002). However, when evaluating the total energy types, including energy purchased, power is produced primarily from hydroelectric renewable energy sources (SMUD, 2000).

It was estimated that the annual energy consumption of RT light rail operation and the West Sacramento electrical system is approximately 862,753 kilowatt hours (kWh). When the proposed project, the West Sacramento electrical system, and the RT light rail system operate concurrently, the annual energy consumption is estimated to be approximately 865,887 kWh. Therefore, if the proposed project were in operation, an additional 3,134 kWh of energy usage annually, or a 4 percent increase, would be required (Hecht, 2008c). This is not considered a substantial increase in energy consumption and represents a very small percentage of electric power. In addition, trips made on buses and cars between West Sacramento and downtown Sacramento that may be diverted to the streetcar would balance the additional electrical power required for streetcar operation. Furthermore, the proposed project is expected to reduce fossil fuel consumption relative to the No-Project Alternative. Therefore, the impact of the proposed project on energy is anticipated less than significant.

Mitigation. No mitigation measures would be required.

Determination. Energy impacts from the proposed project would be less than significant.