5.12 Traffic and Transportation

This section addresses the potential effects of the Contra Costa Generating Station (CCGS) project on traffic and transportation. Section 5.12.1 describes the affected environment of the local and regional traffic and transportation routes surrounding the project site. Section 5.12.2 presents the environmental analysis of the project's effects on local traffic volumes and patterns. Section 5.12.3 evaluates potential cumulative effects on traffic and transportation because of other, simultaneous projects. Section 5.12.4 describes mitigation measures for the project. Section 5.12.5 describes applicable laws, ordinances, regulations, and standards (LORS). Section 5.12.6 lists the applicable regulatory agencies and contacts. Section 5.12-7 discusses traffic and transportation permits required. Section 5.12.8 lists the references used to prepare this section.

5.12.1 Affected Environment

The CCGS will be located in Contra Costa County near the junction of State Route (SR) 4 and SR 160 in Oakley, California. The project site is located in the southwestern corner of the DuPont property which is bordered by the San Joaquin River to the north and east, vineyards and the Burlington Northern Santa Fe railroad corridor to the south, and industrial facilities and the SR 160 corridor to the west. The project site is currently zoned for heavy industrial and is designated for "utility energy" land use in the proposed City of Oakley 2020 General Plan.

5.12.1.1 Existing Regional and Local Transportation Facilities

The surrounding regional and local roadway networks are shown in Figures 5.12-1 and 5.12-2. Access to the site is provided from the east, west, and south via SR 4, and via SR 160 from the north. Local access to the project site is mainly provided by Wilbur Avenue and Bridgehead Road. Construction workers and CCGS employees (for operations) traveling to the site will use the roadways described below.

5.12.1.1.1 State Route 4 / Main Street

SR 4 is an east-west highway that connects Contra Costa County to the San Francisco Bay Area to the west and San Joaquin County to the east. Near the project site, it is called Main Street and joins SR 160 approximately half a mile south of the project site. According to 2007 traffic counts published by Caltrans (Caltrans, 2009a), the average daily traffic volume on SR 4 is 39,000 vehicles per day. Trucks are approximately 5.4 percent of all traffic. It should be noted, however, that a construction effort for Pacific Gas and Electric Company's Gateway Generating Station may have resulted in artificially high traffic count numbers during portions of this time frame.

5.12.1.1.2 State Route 160

SR 160 is a north-south highway that connects Contra Costa County with Sacramento County via the Antioch (John A. Nejedly) Bridge. According to 2007 traffic counts published by Caltrans (Caltrans, 2009a), the average daily traffic volume on SR 4 is 12,800 vehicles per day. Trucks are approximately 6.5 percent of all traffic.

5.12.1.1.3 Wilbur Avenue

Wilbur Avenue is an east-west roadway that provides access to the project site via Bridgehead Road. Wilbur Avenue is under the City of Antioch's jurisdiction. The facility is currently a

four-lane road between SR 160 ramps. Studies conducted for the Marsh Landing Generating Station Application for Certification (AFC) included traffic counts that indicated the average daily traffic in 2007 was approximately 8,800 vehicles per day near the SR 160 ramps.

5.12.1.1.4 Bridgehead Road

Bridgehead Road is a north-south roadway that provides direct access to the project site. It is an undivided road with two lanes (one in each direction). Studies conducted for the Marsh Landing Generating Station AFC included traffic counts that indicated the average daily traffic in 2007 was approximately 9,800 vehicles per day near Wilbur Avenue.

5.12.1.2 Existing Traffic Conditions and Level of Service Analysis

The following traffic analysis was conducted according to the methodologies and procedures outlined in the Highway Capacity Manual (HCM) (Transportation Research Board, 2000), and applicable provisions from the California Environmental Quality Act (CEQA). Average daily traffic for the study area local streets was used in the analysis, as well as peak-hour traffic on state roadways. Morning and afternoon peak-hour turning movement counts were used to assess intersection level of service (LOS).

5.12.1.2.1 Existing Roadway Conditions

The volume/capacity (V/C) ratio is an indicator of traffic conditions, speeds, and driver maneuverability. Table 5.12-1 is a summary of traffic flow characteristics for LOS on multi-lane highway and freeway segments. Table 5.12-1 applies to state roadways. Caltrans does not have an official LOS threshold for state highways, but LOS D is commonly used as the threshold for planning purposes.

TABLE 5.12-1
Level of Service Criteria for Multi-lane Highway and Freeway Segments

LOS	V/C (Multi-lane Highway with 50 mph Free Flow Speed)*	V/C (Basic Freeway with 70 mph Free Flow Speed)*	Traffic Flow Characteristics
A	0.00 – 0.28	0.00 – 0.32	Free flow; insignificant delays
B	0.29 – 0.45	0.33 – 0.53	Stable operation; minimal delays
C	0.46 – 0.65	0.54 – 0.74	Stable operation; acceptable delays
D	0.66 – 0.86	0.75 – 0.90	Approaching unstable flow; queues develop rapidly but no excessive delays
E	0.87 – 1.00	0.91 – 1.00	Unstable operation; significant delays
F	> 1.00	> 1.00	Forced flow; jammed conditions

*Main Street was assumed to be a multi-lane highway with a free flow speed of 50 mph; all other State-maintained segments were assumed to be freeways with a 70 mph free flow speed.

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

For two-lane highways, the criteria in Table 5.12-2 have been used to evaluate traffic conditions. These criteria were applied to the two-lane highway section of SR 160 north of the Antioch Bridge.

LEGEND

- PROJECT SITE
- LOCAL AIRPORT
- MAJOR FREEWAY
- ROADS
- RAILROAD
- LIGHTRAIL/BART

N

0 2 4
MILES

SCALE: 1:250,000

FIGURE 5.12-1
REGIONAL TRANSPORTATION
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

LEGEND

- PROJECT SITE
- RAILROAD/LIGHTRAIL
- BICYCLE TRAILS
- PIPELINES
- RIO VISTA DELTA BREEZE BUS ROUTE
- TRI DELTA TRANSIT BUS ROUTE

N

0 1,000 2,000
FEET

SCALE: 1:24,000

FIGURE 5.12-2
LOCAL TRANSPORTATION
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

TABLE 5.12-2
Level of Service Criteria for Two-Lane Highway Segments in Areas Transitioning into Urbanized Areas

LOS	Maximum Peak-Hour Two-Way Volumes
A	230
B	770
C	1,440
D	2,040
E	2,580

As stated in the City of Oakley Long Range Roadway Plan (City of Oakley, 2002a), the City uses LOS D as its threshold value to define maximum roadway capacity. The LOS D threshold is used in communities throughout Contra Costa County per the Long Range Roadway Plan. Based on an LOS D threshold, Table 5.12-3 shows the maximum daily volumes along local streets.

TABLE 5.12-3
Volume Thresholds for LOS D by Road Type

Road Classification	Daily Volume
2-Lane Collector	12,500
2-Lane Rural Undivided Road	16,200
2-Lane Arterial	17,800
4-Lane Undivided Arterial	33,800
4-Lane Divided Arterial	35,600
6-Lane Divided Arterial	53,400

Source: City of Oakley Long Range Roadway Plan. December 2002a.

Average Daily Traffic (ADT) volumes, truck percentages, k-factors and d-factors for 2007 were provided by Caltrans for state facilities (Caltrans 2009a, Caltrans 2009b). An annual growth factor of 1 percent was applied to adjust traffic counts from 2007 to estimated 2009 levels. On local streets, traffic counts were performed in 2007 for the Marsh Landing Generating Station AFC (Mirant Delta LLC, May 2008); the study applied a growth factor to those counts to estimate Year 2009 traffic volumes based on the Contra Costa Transportation Authority's (CCTA) Travel Demand Model.

A Passenger Car Equivalent (PCE) factor of 1.5 was used to convert the mixed flow of cars and trucks into a uniform passenger car equivalent.

Existing roadway conditions analysis was conducted for the following roadways:

- Bridgehead Road
- Wilbur Avenue
- SR 160
- SR 4 (the section of SR 4 east of SR 160 has signalized intersections, so that portion of the route was not analyzed for this roadway segment analysis).

Table 5.12-4 is a summary of the daily and peak hour traffic volumes and traffic volume (demand)/roadway capacity (V/C) ratios for existing conditions. All segments operate at LOS D or better.

TABLE 5.12-4
Existing Roadway Segment LOS Analysis Summary

Local Facilities	Between	And	Classification	Number of Lanes	Annual Average Daily Volume	LOS	Acceptable?
Bridgehead Road	Shady Haven Trailer Park	Wilbur Avenue	2-Lane Collector	2	9,500	D or better	Yes
Wilbur Avenue	SR 160 NB Ramps	SR 160 SB Ramps	2-Lane Collector	2	10,600	D or better	Yes

State Facilities	Between	And	Classification	Number of Lanes	2-Way AADT	Truck Percent	AM Peak Demand (1-Way)	PM Peak Demand (1-Way)	Peak Hour Capacity	AM Peak V/C	AM Peak LOS	Accept-able?	PM Peak V/C	PM Peak LOS	Accept-able?
SR 4 EB	Hillcrest Avenue	Junction with SR 160	Freeway	2	39,784	0.05	2304	2503	4,000	0.58	C	Yes	0.63	C	Yes
SR 4 WB	Hillcrest Avenue	Junction with SR 160	Freeway	2		0.05	2108	1963	4,000	0.53	B	Yes	0.49	B	Yes
SR 160 NB	Junction with SR 4 East	Wilbur Avenue	Freeway	2	13,057	0.07	348	745	4,000	0.09	A	Yes	0.19	A	Yes
SR 160 SB	Junction with SR 4 East	Wilbur Avenue	Freeway	2		0.07	659	552	4,000	0.16	A	Yes	0.14	A	Yes
SR 160 NB	Wilbur Avenue	Antioch Bridge	Freeway	2	15,199	0.07	405	867	4,000	0.10	A	Yes	0.22	A	Yes
SR 160 SB	Wilbur Avenue	Antioch Bridge	Freeway	2		0.07	767	643	4,000	0.19	A	Yes	0.16	A	Yes
SR 160 NB	Antioch Bridge	Junction with SR 12	Two-Lane Highway	1	15,302	0.07	408	873	2,580	—	B	Yes	—	C	Yes
SR 160 SB	Antioch Bridge	Junction with SR 12	Two-Lane Highway	1		0.07	772	647	2,580	—	C	Yes	—	B	Yes

ADDT = Annual Average Daily Traffic

5.12.1.2.2 Existing Intersection Conditions

The following intersections were studied for existing conditions:

- Main Street and SR 160 SB Ramps (Signalized)
- Main Street and SR 160 NB Ramps (Signalized)
- Main Street and Bridgehead Road (Signalized)
- Wilbur Avenue and SR 160 SB Ramps (Unsignalized)
- Wilbur Avenue and SR 160 NB Ramps (Unsignalized)
- Wilbur Avenue and Bridgehead Road (Unsignalized)

Existing conditions AM and PM peak-hour turning movement counts are illustrated in Figures 5.12-3 and 5.12-4, respectively. Estimated year 2009 peak-hour turning movement volumes along Wilbur Avenue were available from the Marsh Landing Generating Station AFC. May 2002 AM and PM intersection peak-hour turning movement volumes along Main Street were available from the City of Oakley Long Range Roadway Plan. These volumes were used as a conservative estimate of traffic on Main Street, because traffic volumes decreased with the opening of the SR 4 Bypass to the south, reducing volumes along Main Street (State Route 4 Bypass Authority, 2008).

The HCM 2000 methodology has been used to determine the intersection LOS at intersections within the study area. The resulting delay is expressed using LOS, where LOS A represents free-flow activity and LOS F represents overcapacity operation. The relationship between delay and LOS at intersections is summarized in Table 5.12-5, below.

TABLE 5.12-5
Intersection LOS Criteria

LOS	Unsignalized Intersection Delay per Vehicle (seconds)	Signalized Intersection Delay Per Vehicle (seconds)
A	≤10.0	≤10.0
B	>10.0 and ≤15.0	>10.0 and ≤20.0
C	>15.0 and ≤25.0	>20.0 and ≤35.0
D	>25.0 and ≤35.0	>35.0 and ≤55.0
E	>35.0 and ≤50.0	>55.0 and ≤80.0
F	>50.0	>80.0

Source: Highway Capacity Manual, 2000.

The City of Oakley considers LOS D as the limit of acceptable delay for intersections. The CCTA's Congestion Management Program performance element also uses LOS D as the standard for signalized intersections on Main Street, because it is a Route of Regional Significance.

The results of the existing intersection conditions analysis are summarized in Table 5.12-6. All intersections except Main Street/Bridgehead Road (during the PM peak hour) operate at an acceptable LOS.

TABLE 5.12-6
Existing Intersection LOS Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (seconds)	LOS	Delay (seconds)	LOS
Main Street and SR 160 SB Ramps (Signalized)	22	C	24	C
Main Street and SR 160 NB Ramps (Signalized)	16	B	32	C
Main Street and Bridgehead Road (Signalized)	27	C	65	**E**
Wilbur Avenue and SR 160 SB Ramps (Unsignalized)	13 (SB approach)	B	13 (SB approach)	B
Wilbur Avenue and SR 160 NB Ramps (Unsignalized)	15 (NB approach)	B	15 (NB approach)	B
Wilbur Avenue and Bridgehead Road (Unsignalized)	30	D	20	C

Bold indicates unacceptable LOS.

5.12.1.3 Truck Routes—Weight and Load Limitations

The City of Oakley has two major truck routes (SR 4 and East Cypress Road). The City of Oakley's 2020 General Plan (City of Oakley, 2002b) designates the SR 4 Bypass as a future truck route that will serve as the primary route for regional goods movements in the area. Main Street/SR 4 will continue to serve as the primary route for goods movements within Oakley, and will be connected to the SR 4 Bypass by Lone Tree Way in Brentwood and by Laurel Road in Oakley. Additional truck routes include East Cypress Road and Bethel Island Road. Secondary truck routes include all the arterials in the city.

The California Vehicle Code (CVC) Sections 35550–35559 regulates the use of trucks on state facilities, including SR 4/Main Street and SR 160. The City of Oakley regulates the use of trucks off its truck routes within the City.

5.12.1.4 Other Projects

5.12.1.4.1 Future Plans and Projects

The City of Oakley 2002 Long Range Roadway Plan lists the following recommended roadway improvements:

- Improving Bridgehead Road from a two-lane local road to a four-lane divided arterial.
- Installing a traffic signal at the intersection of Bridgehead Road and Wilbur Avenue.

These improvements have not yet been constructed. According to the City of Oakley, there are no immediate plans for additional improvements in the vicinity of the project site (City of Oakley, 2009).

5.12.1.4.2 Local Comprehensive Transportation Plans

The Contra Costa County Draft 2009 Countywide Comprehensive Transportation Plan prepared by the CCTA lays out the future transportation priorities (Contra Costa Transportation Authority, 2009). Its list of future projects includes:

- The construction of a new two-lane roadway and structure over the Union Pacific Railroad tracks to connect westbound SR 4 Bypass to northbound SR 160.

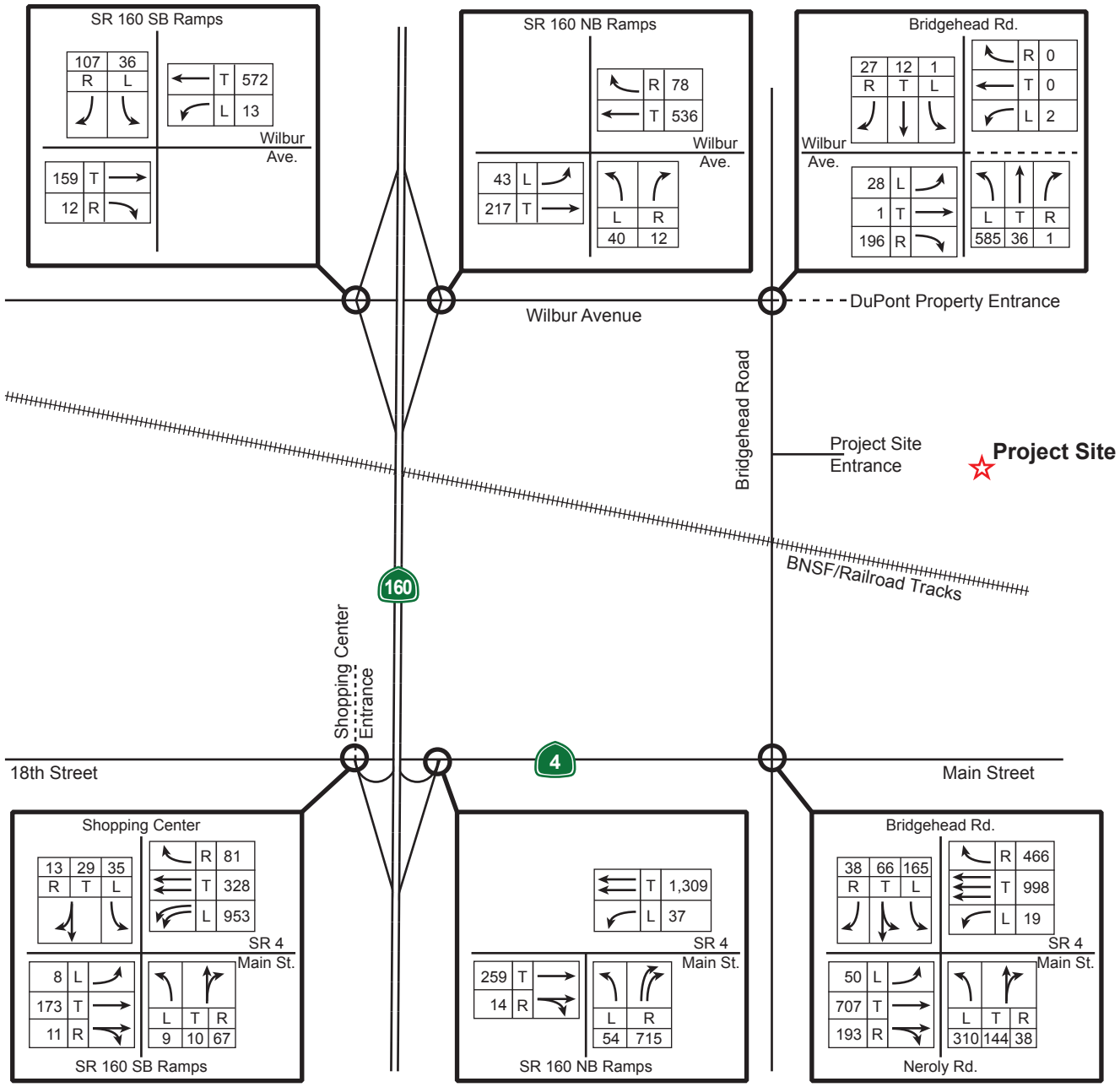

FIGURE 5.12-3
EXISTING AM PEAK HOUR TURNING MOVEMENTS
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

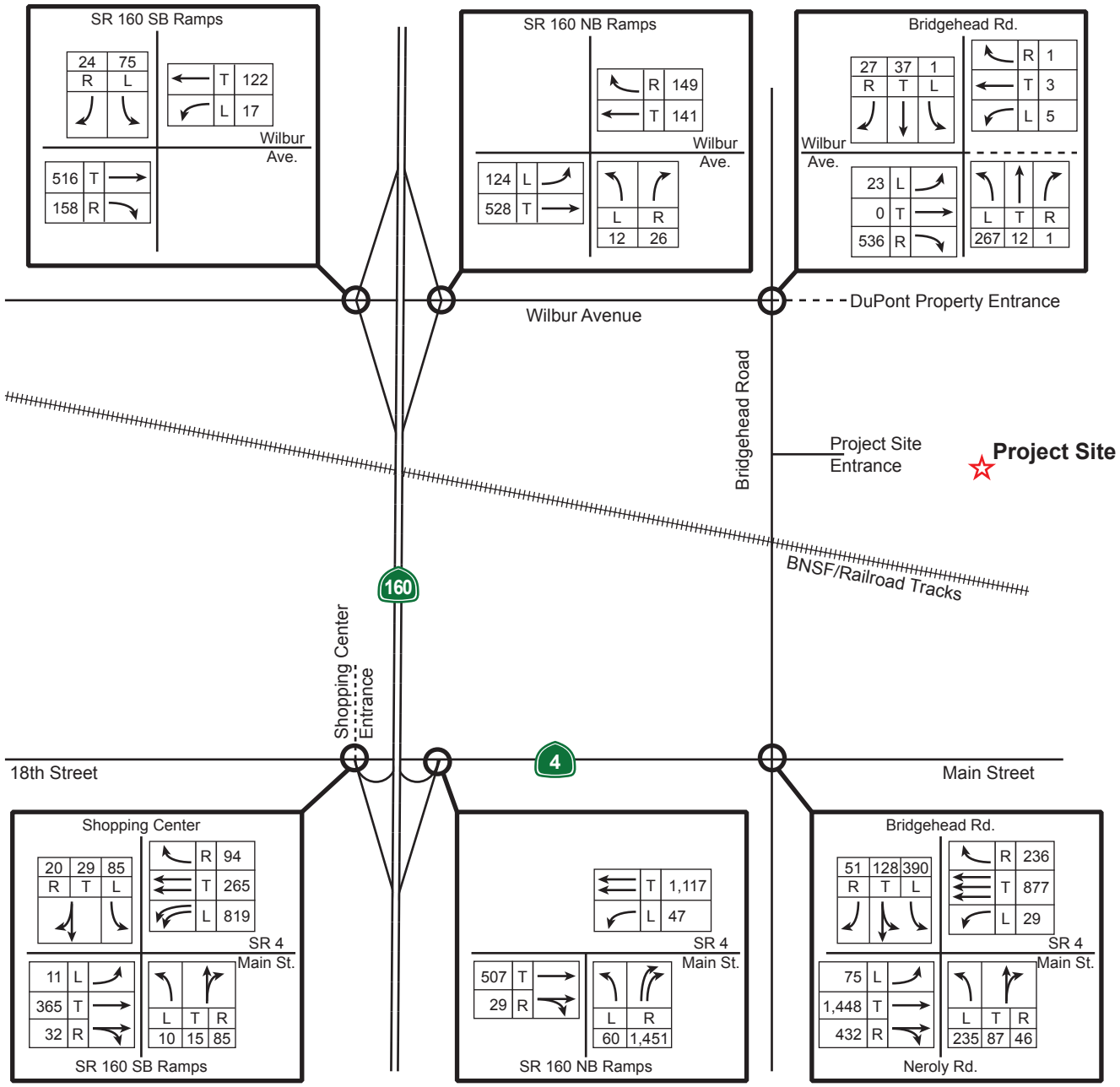

FIGURE 5.12-4
EXISTING PM PEAK HOUR TURNING MOVEMENTS
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

- The construction of a 4-lane freeway from SR 4 to Lone Tree Way, with partial interchanges at SR 4 Lone Tree Way and intersection at Laurel Road.
- The widening of Main Street from 4 to 6 lanes, including widening shoulders, constructing median islands with left-turn pockets, and constructing curbs, gutters, and sidewalk on both sides of the roadway.
- The construction of Main Street Bypass in the City of Oakley.
- The widening of SR 4 from Oakley to Brentwood to 4 lanes.

5.12.1.5 Pedestrian/Bicycle Facilities

According to the City of Oakley's 2002 General Plan, the City presently has limited bicycle facilities. Bicycle lanes are provided on Cypress Road between Rose Avenue and Marsh Creek. Other streets with Class II bicycle lanes include Vintage Parkway from Main Street to Big Break Road, and portions of Delta Road. The Contra Costa County Countywide Transportation Plan designates Oakley Road/Empire Avenue/Cypress Road as a regional bicycle route. No existing facilities are located near the project site. Bridgehead Road is a proposed local multi-use trail. Figure 5.12-2 shows the bicycle facilities in the general vicinity of the project site.

Sidewalks are provided in most of the new Oakley subdivisions, but there are gaps in the pedestrian system, including along Main Street.

5.12.1.6 Public Transportation

The City of Oakley's 2002 General Plan indicates two primary types of public transit service in the city: school bus services and Tri-Delta Transit. The former operates on five routes, while the latter operates six routes throughout the city and beyond. Figure 5.12-2 shows the transit routes operating in the vicinity of the project site.

5.12.1.7 Rail Traffic

Commercial rail service in the area consists of the Burlington Northern Santa Fe Railroad, which has an active freight line handling 28 daily trains. Amtrak also operates 8 to 10 trains on the same tracks; the closest stop is in Antioch. No commuter rail service is provided in Oakley. The railroad crossing at Bridgehead Road is a grade-separated crossing.

5.12.1.8 Air Traffic

There are no airports within 20,000 feet of the CCGS site. The following is a list of public airports within 20 miles and the average number of operations (also see Figure 5.12-1) (AirNav, 2009):

- Funny Farm Airport (Federal Aviation Administration [FAA] Identifier 4CA2) is located about 7 miles southeast of the project site. It is a private airport with about 50 operations per month.
- Rio Vista Municipal Airport (FAA Identifier O88) is located about 11.5 miles northeast of the project site. For a 12-month period ending November 5, 2008, there was an average of 96 aircraft operations per day.

- Buchanan Field Airport (FAA Identifier KCCR) is located about 17 miles southwest of the Project site. For a 12-month period ending April 30, 2008, there was an average of 256 aircraft operations per day.
- Byron Airport (FAA Identifier C83) is located about 13.5 miles southeast of the Project site. For a 12-month period ending January 29, 2004, there was an average of 164 aircraft operations per day.

5.12.2 Environmental Analysis

This section assesses the traffic and transportation effects associated with the construction and operation of the project. This analysis primarily examines effects on roadway LOS expected during construction and operation of the project. Potential traffic effects during construction, as well as plant operation after construction, have been considered and analyzed.

During the peak construction phase, construction will require, at most, 729 workers (see Table 5.10-9 in the Section 5.10, Socioeconomics). During operations, the project is expected to require 11 staff members on average during weekdays. To evaluate the worst-case scenario, traffic impacts associated with peak construction traffic were analyzed. A quantitative traffic analysis was not conducted for the long-term operations phase because it would generate a low volume of trips that will not have a measurable impact on the study area roadways.

5.12.2.1 Significance Criteria

The significance criteria have been developed using guidance provided in CEQA Appendix G (California Code of Regulations (CCR) Title 14 §15000 et seq.) and relevant local policies. Effects of the proposed project on transportation and circulation will be considered significant if the following criteria are met:

- Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system
- Exceed, either individually or cumulatively, an LOS standard established by the county congestion management agency for designated roads or highways
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks
- Substantially increase hazards because of a design feature or incompatible uses
- Result in inadequate emergency access
- Result in inadequate parking capacity
- Conflict with adopted policies, plans, or programs supporting alternative transportation

For LOS requirements, the City of Oakley's requirements (LOS D) have been applied. The analysis of the "with project" traffic scenario was conducted for the peak month construction traffic.

5.12.2.1.1 Construction Traffic Generation

Estimates of the average and peak construction traffic during the onsite construction period were developed based on the size of the workforce. Based on experience with similar projects, it is estimated that some of the workforce will carpool and the average vehicle occupancy will be 1.5 persons per vehicle. During the peak month, the estimated number of construction staff daily one-way trips is 486 (729 ÷ 1.5 = 486). The greatest number of truck trips expected during construction of the project in the peak construction month is approximately 40 daily one-way truck trips; it was assumed that only five deliveries would be made during each peak hour. Peak construction traffic during the peak month (month 23) was used to analyze the worst-case LOS scenario. For purposes of this analysis, the truck trips were converted to PCEs at a ratio of 1.5 passenger cars for each truck, consistent with the HCM guidelines. No offsite traffic will be generated between the construction laydown area and the project site because the construction laydown area and the parking area will be located immediately adjacent to the project site. The construction trip estimates are presented in Table 5.12-7.

TABLE 5.12-7
Construction Trip Generation Estimate

		AM Peak Hour			PM Peak Hour		
Trip Type	**ADT**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Delivery/Haul Trucks	80	5	5	10	5	5	10
PCE (1.5)	120	8	8	16	8	8	16
Workers	972	486	—	486	—	486	486
Total Construction Traffic in PCE	1,092	494	8	502	8	494	502

5.12.2.1.2 Construction Traffic Distribution

The following assumptions were used to distribute construction traffic over the study area network:

- 5 percent of trips would come from Antioch
- 25 percent would come from Sacramento and San Joaquin counties via SR 12
- 35 percent would come from Contra Costa and San Joaquin counties via westbound SR 4
- 35 percent would come from Contra Costa and Alameda counties via eastbound SR 4/northbound SR 160

5.12.2.1.3 Roadway LOS with Construction Traffic

Average peak-hour traffic generated during the construction period was added to the existing traffic volumes on each roadway segment, as shown in Figures 5.12-5 and 5.12-6. The peak-hour traffic volumes for the study area roadway segments in the existing condition and with the addition of construction traffic are summarized in Table 5.12-8. Based on the analysis, the roadway segments are forecasted to operate at an acceptable LOS. The addition of the project's construction traffic to the existing traffic volumes will not result in significant impacts.

TABLE 5.12-8
Roadway Sections LOS Analysis with Project Construction Traffic

Local Facilities	Between	And	Construction Traffic Added	New Daily Volume	New LOS	Acceptable?	Existing LOS
Bridgehead Road	Shady Haven Trailer Park	Wilbur Avenue	1,004	10,504	Better than LOS D	Yes	Better than LOS D
Wilbur Avenue	SR 160 NB Ramps	SR 160 SB Ramps	302	10,902	Better than LOS D	Yes	Better than LOS D

State Facilities	Between	And	Peak Hour Capacity	Traffic Added AM	New AM Peak Demand (1-Way)	New AM Peak V/C	New AM Peak LOS	Acceptable?	Existing AM Peak LOS	Traffic Added PM	New PM Peak Demand (1-Way)	New PM Peak V/C	New PM Peak LOS	Acceptable?	Existing PM Peak LOS
SR 4 EB	Hillcrest Avenue	Junction with SR 160	4,000	173	2,477	0.62	C	Yes	C	3	2,506	0.63	C	Yes	C
SR 4 WB	Hillcrest Avenue	Junction with SR 160	4,000	3	2,111	0.53	B	Yes	B	173	2,136	0.53	B	Yes	B
SR 160 NB	Junction with SR 4 East	Wilbur Avenue	4,000	173	521	0.13	A	Yes	A	3	748	0.19	A	Yes	A
SR 160 SB	Junction with SR 4 East	Wilbur Avenue	4,000	3	662	0.17	A	Yes	A	173	725	0.18	A	Yes	A
SR 160 NB	Wilbur Avenue	Antioch Bridge	4,000	2	407	0.10	A	Yes	A	124	991	0.25	A	Yes	A
SR 160 SB	Wilbur Avenue	Antioch Bridge	4,000	124	891	0.22	A	Yes	A	2	645	0.16	A	Yes	A
SR 160 NB	Antioch Bridge	Junction with SR 12	2,580	2	410	—	B	Yes	B	124	997	—	C	Yes	C
SR 160 SB	Antioch Bridge	Junction with SR 12	2,580	124	896	—	C	Yes	C	2	649	—	B	Yes	B

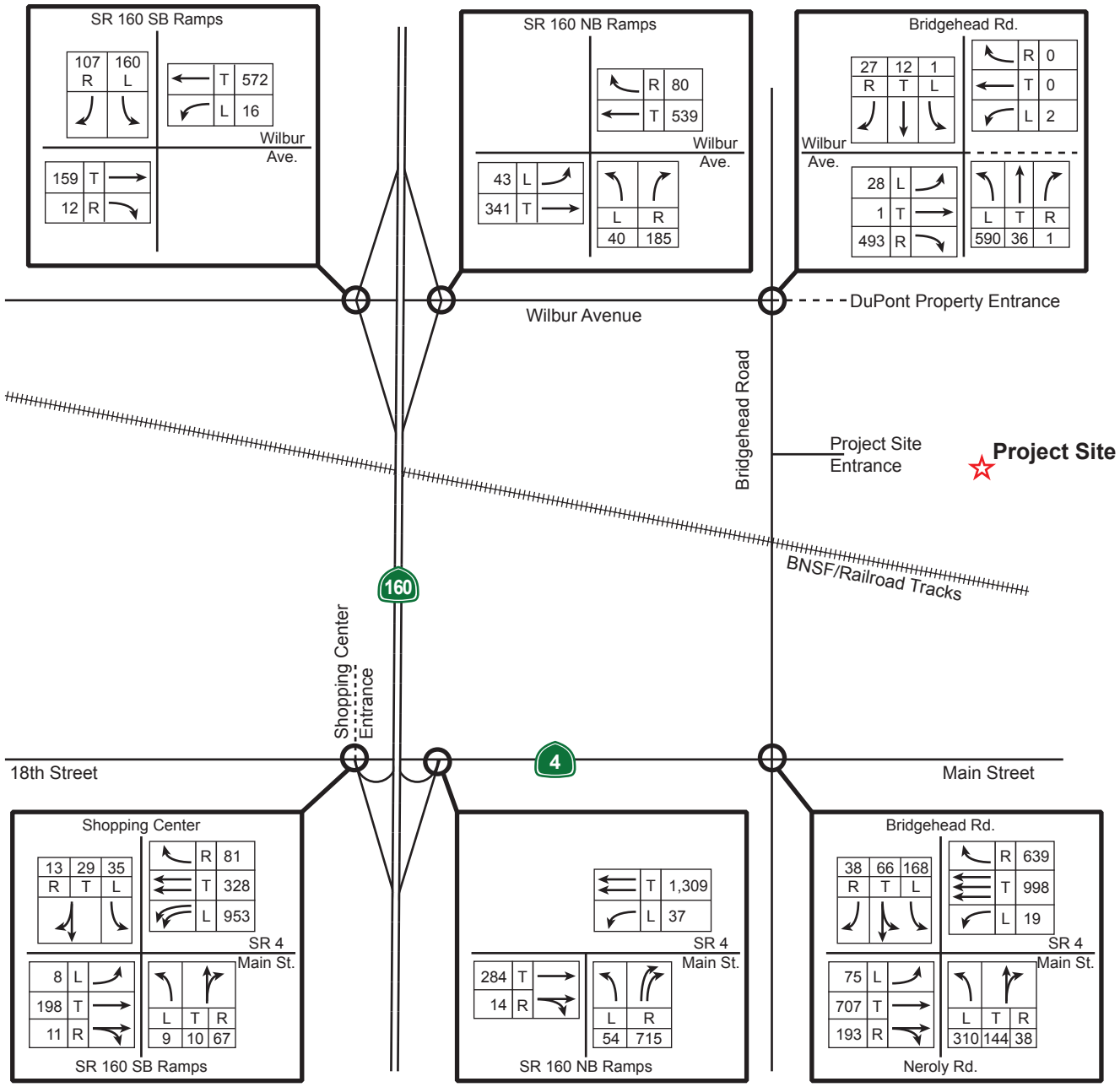

FIGURE 5.12-5
CONSTRUCTION AM PEAK HOUR TURNING MOVEMENTS
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

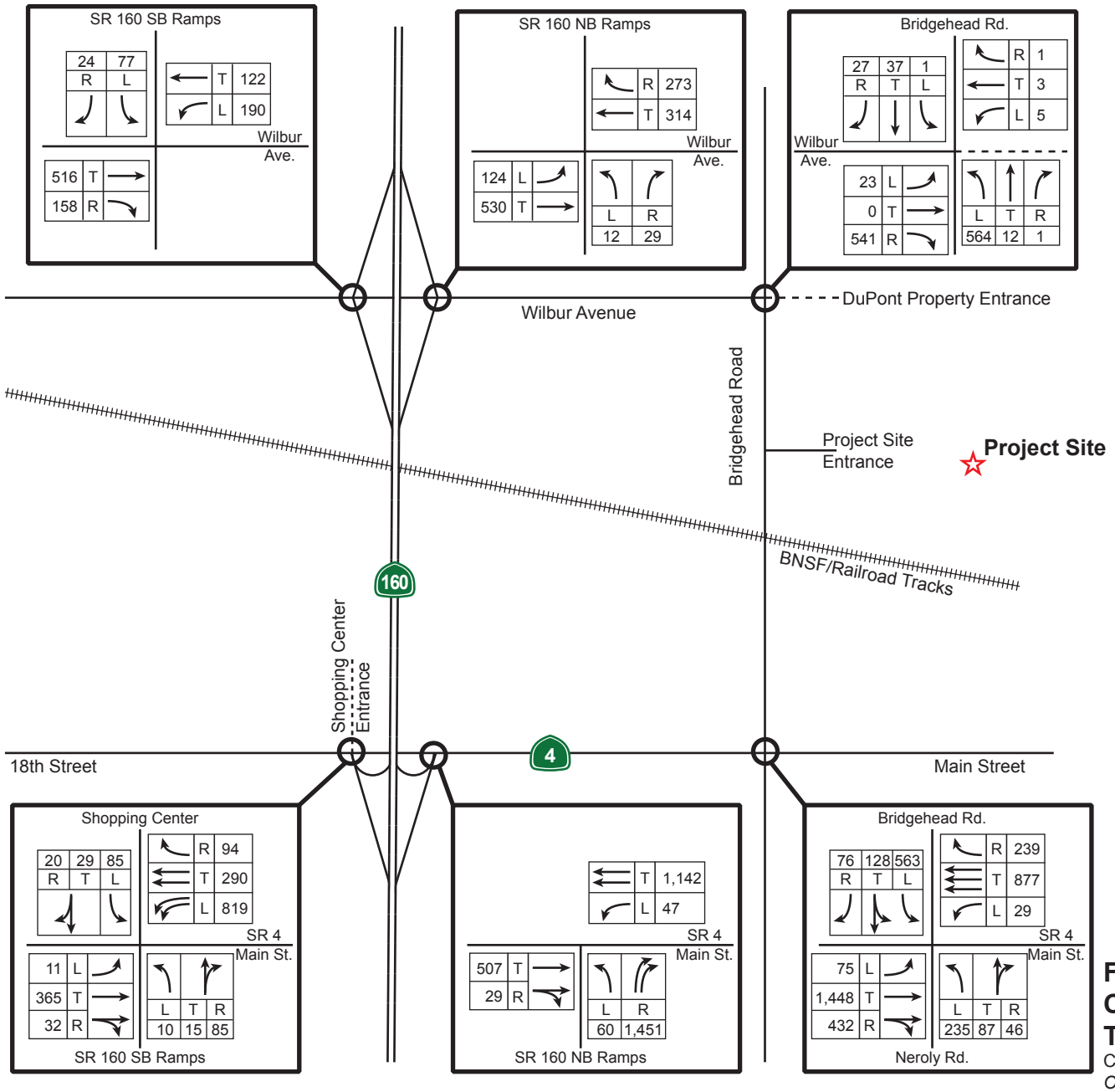

FIGURE 5.12-6
CONSTRUCTION PM PEAK HOUR TURNING MOVEMENTS
CONTRA COSTA GENERATING STATION
OAKLEY, CALIFORNIA

5.12.2.1.4 Intersection LOS with Construction Traffic

The AM and PM peak-hour traffic generated during the construction period was added to the existing turning movement counts on the analyzed intersection within the study corridor. The results of the existing and "with project" AM and PM peak-hour LOS analysis for all study area intersections are summarized in Table 5.12-9.

TABLE 5.12-9
Construction Intersection LOS Summary

	AM Peak Hour				PM Peak Hour			
	With Project		Existing		With Project		Existing	
Intersection	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS	Delay (seconds)	LOS
Main Street and SR 160 SB Ramps (Signalized)	22	C	22	C	24	C	24	C
Main Street and SR 160 NB Ramps (Signalized)	16	B	16	B	33	C	32	C
Main Street and Bridgehead Road (Signalized)	27	C	27	C	**88**	**F**	**65**	**E**
Wilbur Avenue and SR 160 SB Ramps (Unsignalized)	24 (SB approach)	C	13 (SB approach)	B	26 (SB approach)	D	13 (SB approach)	B
Wilbur Avenue and SR 160 NB Ramps (Unsignalized)	12 (NB approach)	B	15 (NB approach)	B	15 (NB approach)	C	15* (NB approach)	B*
Wilbur Avenue and Bridgehead Road (Unsignalized)	**64**	**F**	30	D	**62**	**F**	20	C

*The delay has been rounded up, which explains why for the same delay in seconds, the existing and with project PM Peak Hour LOS at the intersection are different.

Bold indicates an unacceptable LOS

As shown in the table, all study area intersections except two will continue to operate at an acceptable LOS in the AM and PM peak hours with the addition of the project construction traffic.

The Main Street/Bridgehead Road intersection is projected to operate at LOS F during the PM peak hour. It is currently operating at LOS E, which does not meet the City requirements, but nearly 200 additional vehicles will use this intersection during the peak hour. The Wilbur Avenue/Bridgehead Road intersection is projected to operate at LOS F during both AM and PM peak hours. The addition of project-related traffic during construction to these intersections, which are currently functioning below standard, is considered significant.

5.12.2.2 Transport of Hazardous Materials

The quantities of hazardous materials that will be on site during construction are small relative to the quantities used during operation. They will be limited to gasoline, diesel fuel, motor oil, hydraulic fluid, solvents, cleaners, sealants, welding flux, various lubricants,

paint, and paint thinner. There are no feasible alternatives to vehicle fuels and oils for operating construction equipment. The types of paint required are dictated by the types of equipment and structures that must be coated and by the manufacturers' requirements for coating.

Most of the hazardous substances that will be used by the project during operations are required for facility maintenance and lubrication of equipment, or will be contained within transformers and electrical switches. Deliveries are expected to occur three times a week.

The only acutely hazardous substance that will be used for the project is aqueous ammonia. The material would be transported as hazardous materials or hazardous waste. Transport route arrangements will be required with Caltrans officials for permitting and escort, as applicable. Because the transport of hazardous wastes will be conducted in accordance with the relevant transportation regulations, no significant impact is expected.

According to Division 13 Section 31303 of the CVC, the transportation of regulated substances and hazardous materials will be on the state or interstate highways that offer the shortest overall transit time possible. Transporters of hazardous or explosive materials must contact the California Highway Patrol (CHP) and apply for a Hazardous Material Transportation License. Upon receiving this license, the shipper will obtain a handbook that will specify the routes approved to ship inhalation hazards or explosive materials. The exact route of the inhalation hazard or explosive material shipment will not be determined until the shipper contacts the CHP and applies for a license. Transportation impacts related to hazardous materials associated with the project operations will not be significant because deliveries of hazardous materials will be limited. Delivery of these materials will occur over prearranged routes and will be in compliance with all LORS governing the safe transportation of hazardous materials.

Standards for the transport of hazardous materials are contained in the Code of Federal Regulations (CFR), Title 49 and enforced by the U.S. Department of Transportation. Additionally, the State of California has promulgated rules for hazardous waste transport that can be found in CCR Title 26. Additional regulations for the transportation of hazardous materials are outlined in the CVC (Sections 2500-505, 12804-804.5, 31300, 3400, and 34500-501). The two state agencies with primary responsibility for enforcing federal and state regulations governing the transportation of hazardous wastes are the CHP and Caltrans. Transport of hazardous materials to and from the project site will comply with all applicable requirements.

The recommended routes, subject to Caltrans approval, are as follows:

- Coming from the east:
  - Use westbound SR 4 and turn onto Bridgehead Road.
- Coming from the west:
  - Use eastbound SR 4/SR 160, exit at Wilbur Avenue and turn onto Bridgehead Road.

Hauling would be carried out in accordance with local, state, and federal regulations that include the Resource Conservation and Recovery Act (42 U.S. Code 6901 et seq.) and the California Integrated Waste Management Act (Public Resources Code Sections 40000 et seq.).

In addition, the federal government prescribes regulations for transporting hazardous materials. These regulations are described in the CFR, Title 49, Section 171. These laws and ordinances place requirements on various aspects of hazardous waste hauling, from materials handling to vehicle signs, to ensure public safety.

The CCGS will comply with these requirements by obtaining a Hazardous Material Transportation License, as discussed above. As a result, impacts will be less than significant.

5.12.2.3 Public Safety

Truck trips, including delivery of hazardous materials and removal of wastes, pose potential hazards for the public. However, the transporter will be required to obtain a Hazardous Material Transportation License in accordance with CVC Section 32105 and will be required to follow appropriate safety procedures when transporting and handling such materials.

At-grade railroad crossings can be another potential hazard to the public. However, there are no at-grade crossings in the vicinity of the project site. Therefore, public safety is not jeopardized.

5.12.2.4 Air Traffic

The project will not increase air traffic levels nor change air traffic patterns. There will be no impacts to air traffic.

5.12.2.5 Emergency Vehicle Access

Emergency vehicles will be able to access the project site through the entrance off Bridgehead Road. There will be no impacts to emergency vehicle access.

5.12.2.6 Parking

Construction workers will park at the project laydown area within the project site's boundaries. No on-street parking is anticipated. Parking spaces will also be provided to employees during operations.

5.12.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code § 21083; CCR, Title 14, §15064(h), 15065(c), 15130, and 15355). Cumulative traffic impacts may occur when more than one project has an overlapping construction schedule that generates excessive construction-related traffic.

The project that could impact traffic conditions in the vicinity of the CCGS site is the River Oaks Crossing, which is proposed on property south of the project site and BNSF railroad tracks. However, due to a lack of tenants, no opening date (and therefore, construction date) has been set. If the River Oaks Crossing project is built, it is expected to generate 1,200 new morning peak hour trips and 2,700 new evening peak hour trips (City of Oakley, 2008a; City of Oakley, 2008b). City of Oakley staff did not indicate any other commercial project generating large numbers of trips (City of Oakley, 2009). Therefore, a cumulative impact analysis was not conducted.

The Marsh Landing Generating Station is proposing to construct a new power plant in Antioch, northwest of the CCGS project site. The Marsh Landing project has filed an AFC with the California Energy Commission and expects to begin construction within the same general time period as the CCGS. It is not possible at this time, however, to project schedules for certifying and constructing new power plants. Although it is reasonably foreseeable that both the Marsh Landing and CCGS projects could be certified and constructed in the same time frame, it is not certain that this would occur. Therefore, any potential traffic impacts that could result if the two projects were to be constructed during the same period should be evaluated at the time of certification. If impacts are likely, these would be temporary construction impacts that could be managed through traffic management planning.

Cumulative impacts resulting from operation would be unlikely, due to the relatively low numbers of vehicle trips that the CCGS would generate during operation.

5.12.4 Mitigation Measures

The addition of project-related construction traffic would cause significant impacts to the operations at the Main Street/Bridgehead Road intersection and the Wilbur Avenue/Bridgehead Road intersection.

To mitigate these potential impacts, the construction contractor will be required to prepare a Transportation Management Plan (TMP). The TMP will address the potential to reroute and reschedule construction traffic to reduce traffic volumes at these intersections. The TMP should also include provisions for monitoring intersection operations, particularly at the Wilbur Avenue/Bridgehead Road unsignalized intersection to determine if unacceptable delays are occurring during construction. If this is the case, other mitigation measures (e.g., temporary restriping or a flagpersons) may be required.

The TMP also will address timing of heavy equipment and building material deliveries, potential street or lane closures, signing, lighting, and traffic control device placement. Damage to any roadway caused by project construction traffic will be restored to or near its preexisting condition based on the procedures established by the TMP. The construction contractor will work with the local agency's engineer to prepare a schedule and mitigation plan for the roadways along the construction routes in accordance with the procedures established by the TMP.

With implementation of the TMP, the project's impacts on traffic and transportation will be less than significant.

5.12.5 Laws, Ordinances, Regulations, and Standards

LORS related to traffic and transportation are summarized in the following subsections. Table 5.12-10 summarizes all applicable federal, state, and local LORS and administering agencies, and describes how the applicant will comply with all LORS pertaining to traffic and transportation impacts.

TABLE 5.12-10
Laws, Ordinances, Regulations, and Standards for Traffic and Transportation

LORS	Requirements/Applicability	Administering Agency	AFC Sections Explaining Conformance
49 CFR, Section 171-177 and 350-399	Requires proper handling and storage of hazardous materials during transportation.	U.S. Department of Transportation and Caltrans	Project and transportation will comply with all standards for the transportation of hazardous materials. (Sections 5.12.2.2 and 5.12.5.1)
14 CFR, Section 77.13(2)(i), 77.17, 77.21, 77.23, and 77.25	Requires an applicant to notify the FAA of the construction or alterations of structures within certain distance from an airport, in order to avoid air navigation conflicts.	U.S. Department of Transportation and Federal Aviation Administration	No airports are within 20,000 feet of the project site; therefore, this requirement is not applicable (Section 5.12.5.1)
CVC §13369, 15275, and 15278	Addresses the licensing of drivers and classifications of licenses required for the operation of particular types of vehicles. In addition, certificates permitting the operation of vehicles transporting hazardous materials are required.	Caltrans	The project will conform to these sections in the CVC. (Section 5.12.5.2)
CVC §25160 et seq.	Addresses the safe transport of hazardous materials.	Caltrans	The project will conform to these sections in the CVC. (Section 5.12.5.2)
CVC §2500-2505	Authorizes the issuance of licenses by the Commissioner of the CHP for the transportation of hazardous materials including explosives.	Caltrans	The project will conform to these sections in the CVC. (Section 5.12.5.2)
CVC §31300 et seq.	Requires transporters to meet proper storage and handling standards for transporting hazardous materials on public roads.	Caltrans	Transporters will comply with standards for transportation of hazardous materials on state highways during construction and operations. The project will conform to CVC §31303 by requiring that shippers of hazardous materials use the shortest route possible to and from the site. (Section 5.12.5.2)
CVC §31600 – 31620	Regulates the transportation of explosive materials.	Caltrans	The project will conform to CVC §31600 – 31620. (Section 5.12.5.2)
CVC §32000 – 32053	Regulates the licensing of carriers of hazardous materials and includes noticing requirements.	Caltrans	The project will conform to CVC §32000 – 32053. (Section 5.12.5.2)
CVC §32100 – 32109 and 32105	Establishes special requirements for the transportation of substances presenting inhalation hazards and poisonous gases. Requires that shippers of inhalation or explosive materials contact the CHP and apply for a Hazardous Material Transportation License.	Caltrans	The project will conform by requiring shippers of inhalation or explosive materials to contact the CHP and obtain a Hazardous Materials Transportation License. (Section 5.12.2.2 and Section 5.12.5.2)

TABLE 5.12-10
Laws, Ordinances, Regulations, and Standards for Traffic and Transportation

LORS	Requirements/Applicability	Administering Agency	AFC Sections Explaining Conformance
CVC §34000–34121	Establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.	Caltrans	The project will conform to CVC §§34000–34121. (Section 5.12.2.2 and Section 5.12.5.2)
CVC §34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5–7, 34506, 34507.5 and 34510–11	Regulates the safe operation of vehicles, including those used to transport hazardous materials.	Caltrans	The project will conform to these sections in the CVC. (Section 5.12.2.2 and Section 5.12.5.2)
S&HC §660, 670, 1450, 1460 et seq., 1470, and 1480	Regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.	Caltrans	The project will conform to these sections in the S&HC. (Section 5.12.5.2)
S&HC §117, 660–711	Requires permits from Caltrans for any roadway encroachment during truck transportation and delivery.	Caltrans	Encroachment permits will be obtained by transporters, as required. (Section 5.12.6)
CVC §35780; S&HC §660–711	Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.	Caltrans	Transportation permits will be obtained by transporters for all overloads, as required. (Section 5.12.7)
CVC §35550–35559	Regulates weight and load limitations.	Caltrans	The project will conform to these sections in the CVC. (Section 5.12.6)
California State Planning Law, Government Code Section 65302	Project must conform to the General Plan.	Caltrans	Project will comply with the City of Oakley's General Plan. (Section 5.12.5.3)
Circulation Element of the City of Oakley General Plan	Specifies long-term planning goals and procedures for transportation infrastructure system quality in the City of Oakley.	City of Oakley	The project will have no significant impact on the City's traffic and transportation infrastructure. (Section 5.12.5.3)

CVC California Vehicle Code
S&HC California Streets and Highways Code

5.12.5.1 Federal LORS

- Title 49, CFR, Sections 171-177 (49 CFR 171–177), governs the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- 49 CFR 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.
- 49 CFR 397.9, the Hazardous Materials Transportation Act of 1974, directs the U.S. Department of Transportation to establish criteria and regulations for the safe transportation of hazardous materials.
- 14 CFR 77.13(2)(i) requires an applicant to notify the Federal Aviation Administration (FAA) of the construction of structures within 20,000 feet of the nearest point of the nearest runway of an airport with at least one runway longer than 3,200 feet. Byron Airport is the closest airport to the site and is located more than 20,000 feet south of the CCGS site; therefore, this requirement is not applicable.
- 14 CFR 77.17 requires an applicant to submit a Notice of Proposed Construction or Alteration (FAA Form No. 7460-1) to the FAA for construction within 20,000 feet of the nearest runway of an airport with at least one runway longer than 3,200 feet. This requirement is not applicable
- 14 CFR 77.21, 77.23, and 77.25 outlines the criteria used by the FAA to determine whether an obstruction would create an air navigation conflict. The CCGS is more than 3 nautical miles from the nearest airport. Because of the distance, these requirements are not applicable.

5.12.5.2 State LORS

- CVC Sections 13369, 15275, and 15278 address the licensing of drivers and classifications of licenses required to operate particular types of vehicles. In addition, certificates permitting the operation of vehicles transporting hazardous materials are addressed.
- CVC Sections 25160 et seq. address the safe transport of hazardous materials.
- CVC Sections 2500–2505 authorize the issuance of licenses by the Commissioner of the CHP to transport hazardous materials, including explosives.
- CVC Sections 31300 et seq. regulate the highway transportation of hazardous materials, routes used, and restrictions. CVC Section 31303 requires hazardous materials to be transported on state or interstate highways that offer the shortest overall transit time possible.
- CVC Sections 31600–31620 regulate the transportation of explosive materials.
- CVC Sections 32000–32053 regulate the licensing of carriers of hazardous materials and include noticing requirements.
- CVC Sections 32100–32109 establish special requirements for the transportation of substances presenting inhalation hazards and poisonous gases. CVC Section 32105

requires shippers of inhalation hazards or explosive materials to contact the CHP and apply for a Hazardous Material Transportation License. Upon receiving this license, the shipper will obtain a handbook specifying approved routes.

- CVC Sections 34000–34121 establish special requirements for transporting flammable and combustible liquids over public roads and highways.
- CVC Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5–7, 34506, 34507.5, and 34510–11 regulate the safe operation of vehicles, including those used to transport hazardous materials.
- California S&HC, Sections 660, 670, 1450, 1460 et seq. 1470, and 1480, regulate right-of-way encroachment and granting of permits for encroachments on state and county roads.
- S&HC Sections 117 and 660–711 and CVC Sections 35780 et seq., require permits to transport oversized loads on county roads. S&HC Sections 117 and 660 to 711 require permits for any construction, maintenance, or repair involving encroachment on state highway rights-of-way. CVC Section 35780 requires approval for a permit to transport oversized or excessive loads over state highways.
- Caltrans weight and load limitations for state highways apply to all state and local roadways. The weight and load limitations are specified in CVC Sections 35550 to 35559. The following provisions, from the CVC, apply to all roadways and are therefore applicable to this project.

  General Provisions:

  – The gross weight imposed upon the highway by the wheels on any axle of a vehicle shall not exceed 20,000 pounds and the gross weight upon any one wheel, or wheels, supporting one end of an axle, and resting upon the roadway, shall not exceed 10,500 pounds.

  – The maximum wheel load is the lesser of the following: (a) the load limit established by the tire manufacturer, or (b) a load of 620 pounds per lateral inch of tire width, as determined by the manufacturer's rated tire width.

  Vehicles with Trailers or Semi-trailers:

  – The gross weight imposed upon the highway by the wheels on any one axle of a vehicle shall not exceed 18,000 pounds and the gross weight upon any one wheel, or wheels, supporting one end of an axle and resting upon the roadway, shall not exceed 9,500 pounds, except that the gross weight imposed upon the highway by the wheels on any front steering axle of a motor vehicle shall not exceed 12,500 pounds.
- California State Planning Law, Government Code Section 65302, requires each city and county to adopt a General Plan, consisting of seven mandatory elements, to guide its physical development. Section 65302(b) requires that a circulation element be one of the mandatory elements.

- All construction in the public right-of-way will need to comply with the "Manual on Uniform Traffic Control Devices" (Caltrans, 2003; Federal Highway Administration [FHWA], 2003).

5.12.5.3 Local LORS

This section reviews compliance with all relevant local LORS without regard to their applicability as a matter of law. These LORS include the following:

- The City of Oakley's General Plan Circulation Element, which is a part of the City of Oakley's General Plan, sets LOS D as the minimum acceptable LOS on City roadways. LOS E is acceptable for Routes of Regional Significance. Signalized intersections along SR 4 from SR 160 to the San Joaquin County line shall operate at LOS D or better, or LOS E or better at unsignalized intersections. Intersections on all other roadways shall operate at LOS D or better.
- The City of Oakley's transportation permit requires a permit from the Public Works Department before operating any oversized loads on city roads. The project will comply with the transportation permit requirements by obtaining the permit from the Public Works Department before operating any oversized loads on city roads.
- The Contra Costa County Draft 2009 Countywide Comprehensive Transportation Plan prepared by the CCTA lays out the future transportation priorities. Four key goals are presented:
  - Enhance the movement for people and goods on highway and arterial roads
  - Manage the impacts of growth to sustain Contra Costa's economy and preserve its environment
  - Expand safe, convenient and affordable alternatives to the single-occupant vehicle
  - Maintain the transportation system
- Contra Costa County requires a permit before operating any oversized/overweight vehicles within the County. The project will comply with the transportation permit requirements by obtaining the permit from the Permits Center before operating any oversized vehicles within the unincorporated parts of the County.

5.12.6 Agencies and Agency Contacts

Table 5.12-11 lists the agency contacts related to traffic and transportation.

TABLE 5.12-11
Agency Contacts for Traffic and Transportation

Issue	Agency	Contact
Transportation Permit for Oversized Loads	Caltrans	Officer on Duty Caltrans North Region Transportation Permits Office 1823 14th Street Sacramento, CA 95814 (909) 383-4637
Transportation Permit for Oversized or Overweight Loads	Contra Costa County	Bob Hendry Contra Costa County Permits Center 651 Pine Street, 2nd FL, North Wing Martinez, CA 94553 (925) 335-1375
Transportation Permit for Oversized Loads	City of Oakley	Allen Bourgeois City of Oakley Public Works 3231 Main Street Oakley, CA 94561 (925) 625-7039
Hazardous Material Transportation License	California Highway Patrol	Accounting Section (HM Licensing Program) P.O. Box 942902 Sacramento, CA 94298-2902 (916) 327-5039 Email form available at: http://www.chp.ca.gov/prog/email.cgi
Safety Permits	Federal Motor Carrier Safety Administration	California Field Office 1325 J Street, Suite 1540 Sacramento, CA 95814 (916) 930-2760 Fax: (916) 930-2770 Email contact depends on the nature of the hazardous material hauled.

5.12.7 Permits and Permit Schedule

Table 5.12-12 lists the permits related to traffic and transportation and the permit schedule. The vehicles used to transport heavy equipment and construction materials will require transportation permits when they exceed the size, weight, width, or length thresholds set forth in Section 35780 of the CVC, Sections 117 and 660-711 of the California State Highway Code, and Sections 1411.1 to 1411.6 of the CCRs. Affected vehicles will be required to obtain transportation permits from Caltrans, Contra Costa County, and the City of Oakley, or any other affected agency.

Transport route arrangements would be required with Caltrans and CHP officials for permitting and escort, as applicable. Transportation of hazardous materials to and from CCGS will be conducted in accordance with CVC Section 31303.

TABLE 5.12-12
Permits and Permit Schedule for Traffic and Transportation

Permit	Agency Contact	Schedule
Single/annual-trip transportation permit for oversized loads and oversized vehicles	Permit Officer on Duty Caltrans – South Region Transportation Permits Office (909) 383-4637	Obtain when necessary, 2-hour processing time (single trip) to 2 weeks (annual trip).
Hazardous materials transportation license	California Highway Patrol Hazardous Material Licensing Program (916) 327-5039	Obtain when necessary, approximately 2-week processing time.
Overweight Transportation Permit	Bob Hendry Contra Costa County Permits Center 651 Pine Street, 2nd FL, North Wing Martinez, CA 94553 (925) 335-1375	1 hour for single-trip permits; 1 week for annual permits.
Transportation permit for oversize and overweight loads through the City of Oakley	Allen Bourgeois City of Oakley Public Works 3231 Main Street Oakley, CA 94561 (925) 625-7039	Obtain when necessary, issuance within 24 hours for a single trip permit; no blanket permits are issued.

5.12.8 References

AirNav. 2009. Airport Information. Web site: http://www.airnav.com/airports/

California Department of Motor Vehicles. California Streets and Highway Code. Web site: http://www.dmv.ca.gov/pubs/vctop/appndxa/tocs/strtc.htm

California Department of Motor Vehicles. California Vehicle Code. Web site: http://www.dmv.ca.gov/pubs/vctop/vc/vc.htm.

Caltrans. 2003. Manual of Uniform Traffic Control Devices 2003 California Supplements. Web site: http://www.dot.ca.gov/hq/traffops/signtech/mutcdsupp/supplement.htm

Caltrans. 2009a. 2007 Traffic Volumes on the California State Highway System. Web site: http://traffic-counts.dot.ca.gov/2007all.htm

Caltrans. 2009b. 2007 Annual Average Daily Truck Traffic on the California State Highway System. Web site: http://traffic-counts.dot.ca.gov/truck2007final.pdf

City of Oakley. 2002a. City of Oakley Long Range Roadway Plan. December. Web site: http://www.ci.oakley.ca.us/UserFiles/File/Public%20Works/Long%20Range%20Roadway%20Plan.pdf

City of Oakley. 2002b. City of Oakley General Plan. December. Web site: http://www.ci.oakley.ca.us/subPage.cfm?page=572363&CFID=11554035&CFTOKEN=99388135

City of Oakley. 2008a. River Oaks Crossing Specific Plan Draft Environmental Impact Report. Web site: http://www.ci.oakley.ca.us/UserFiles/File/planning/RiverOaksCrossing%20Revised/3.2%20Circulation%20&%20Transportation_final.pdf

City of Oakley. 2008b. River Oaks Crossing Specific Plan Final Environmental Impact Report. Web site: http://www.ci.oakley.ca.us/UserFiles/File/planning/River%20Oaks%20Crossing%20FEIR/ROC_FEIR_Appendix%20B.pdf

City of Oakley. 2009. Personal Communication with J. McMurray.

Contra Costa Transportation Authority. 2009. 2009 Countywide Transportation Plan. http://www.ccta.net/assets/documents/Available~Publications/GMP~and~CMP~Publications/DraftCTP.021309.pdf

Federal Highway Administration. 2003. Manual on Uniform Traffic Control Devices. http://mutcd.fhwa.dot.gov/

Mirant Delta LLC. 2008. Marsh Landing Generating Station Application for Certification. Web site: http://www.energy.ca.gov/sitingcases/marshlanding/documents/applicant/afc/Volume%20I/

State Route 4 Bypass Authority. 2008. Fact Sheet. Web site: http://sr4bypass.org/Information/Fact%20Sheet.pdf

Transportation Research Board. 2000. *Highway Capacity Manual*.