O. Transportation

Environmental Setting

Existing Roadways

The project site is located north of Washington Street and west of Broadway (U.S. Highway 101) in the City of Eureka. Waterfront Drive, which parallels Humboldt Bay, forms the northern and western boundary of the project site. Figure IV.O-1 illustrates the project site location in relation to the nearby roadway system and the study roadways and intersections.

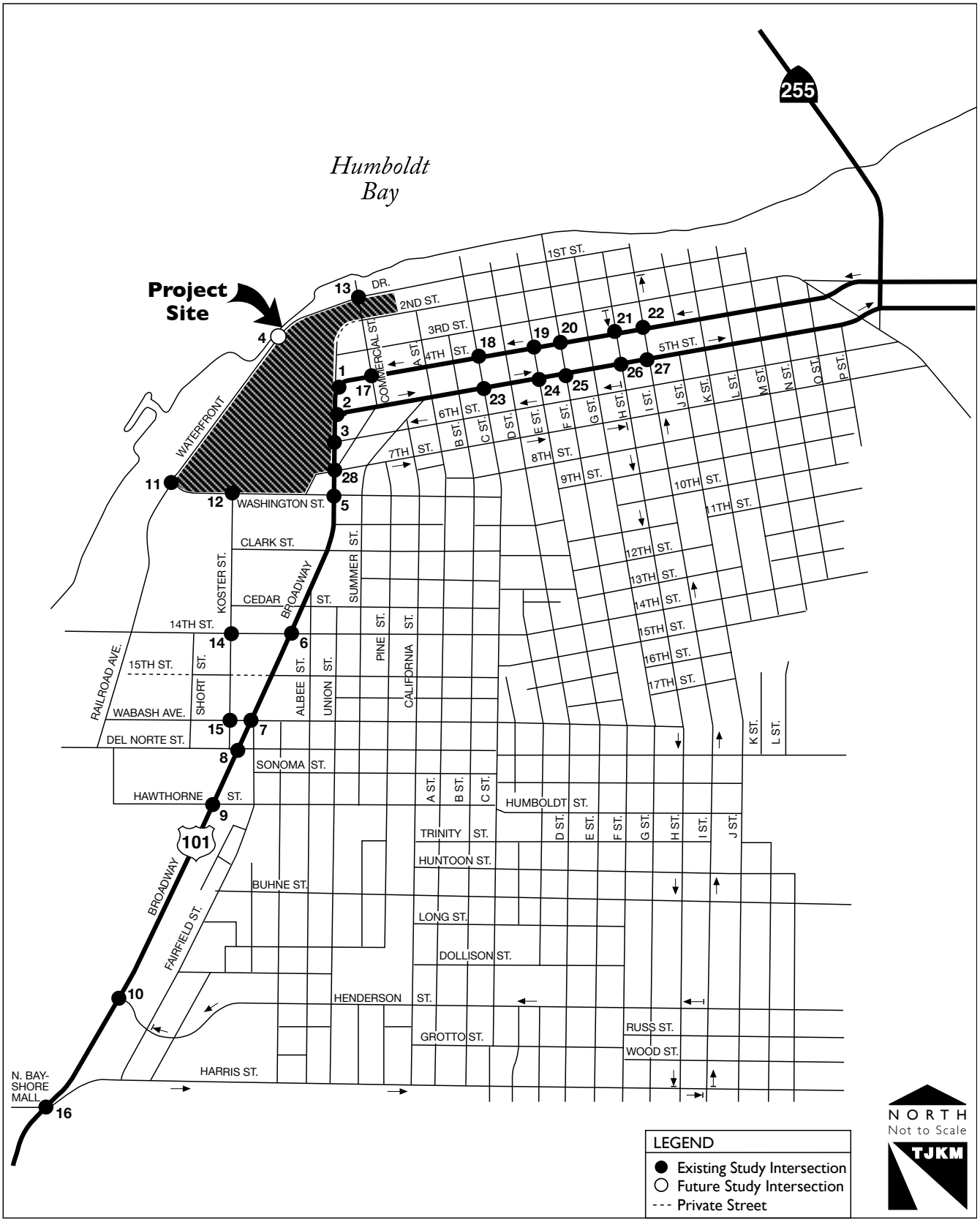
Regional and local road access to the project site is primarily provided by U.S. 101 (Broadway). Broadway extends to the south from the western edge of downtown Eureka. U.S. 101 turns 90 degrees to the east through downtown Eureka as a one-way couplet on Fourth and Fifth streets.

Broadway

Broadway (U.S. 101 south of Fourth Street) is a four-lane, north-south major arterial south of Fifth Street, and extends through Eureka roughly following Humboldt Bay. North of Fourth Street, Broadway is a local street with badly deteriorated pavement. There is a sidewalk only on the east side. Broadway terminates 110 feet south of Second Street and beyond this point the street is an unimproved private street. There are no marked lanes north of Fourth Street. Between Fourth and Fifth Streets, Broadway is a one-way, two-lane southbound street plus a left turn lane for turns to eastbound Fifth Street. The one-way couplet of U.S. 101 through downtown Eureka begins at Broadway and Fifth Street. Near the city limits of Eureka 3 miles south of the project site, U.S. 101 (Broadway) transitions to a grade-separated freeway at the Herrick Avenue overpass. The speed limit on Broadway north of Wabash Avenue to Fourth Street is 30 miles per hour (mph), while south of Wabash Avenue to the freeway it is 40 mph. Westbound Fourth Street turns, without a stop sign, onto southbound Broadway with an advisory speed of 15 mph. Southbound Broadway at Fourth Street is controlled by a stop sign. Broadway is two-way between Fourth Street and Second Street with a prima facie speed limit of 25 mph.

Parking is prohibited on both sides of Broadway from Fifth Street to just south of Wabash Avenue (on-street parking is allowed on the east side of Broadway between Fourth and Fifth Streets). The section from Fourth Street to Wabash Avenue is approximately 0.7 miles. From Wabash Avenue to Fourth Street, Broadway is 55 feet from curb to curb within a 70-foot right-of-way.

South of Wabash Avenue, the right-of-way along Broadway widens to 100 feet with a curb-to-curb width of 73 feet. Broadway remains a four-lane highway with a two-way left turn lane all the way to the freeway (there are directional left turn lanes at signalized intersections). On-street parking is allowed south of Wabash Avenue on the west side, and south of Del Norte Street on the east side. There is an edge stripe providing a 7- to 12-foot shoulder on both sides along this



Marina Center Mixed-Use Development Project . 205513

SOURCE: TJKM Transportation Consultants

Figure IV.O-1
Vicinity Map

section of Broadway. From Wabash Avenue, Broadway extends another 2.4 miles before becoming a freeway at the Herrick Avenue overpass.

Washington Street

Washington Street is a 44-foot-wide, two-lane roadway extending east and west. It begins at Waterfront Drive on the west and extends east to C Street. There is a signal at Broadway and Washington Street. Parking is generally allowed on both sides along the entire length.

Fourth and Fifth Street

Fourth and Fifth Street One-Way Couplet (U.S. 101) extends east from Broadway through downtown Eureka. Both Fourth and Fifth streets are 51-foot-wide, three-lane, one-way streets with parking on both sides between Broadway and Myrtle. Fourth Street is one-way westbound and Fifth Street is one-way eastbound. Parking is prohibited on Fourth Street east of V Street and on Fifth Street east of Myrtle Avenue where both streets narrow to 42.5 feet in width. Through downtown Eureka, there are signals at most of the cross streets, with pedestrian crossings on all approaches. Neither the Fourth Street intersection nor the Fifth Street intersection with Broadway is signalized. The closest signals to the east on both Fourth and Fifth streets are at E Street, approximately 2,000 feet east of Broadway.

Sixth Street

Sixth Street is a 42-foot-wide, one-way, westbound, two-lane roadway through downtown Eureka ending at Broadway. It is a designated bike route and emergency route for fire equipment. The intersection of Sixth Street and Broadway is signalized. The westbound bike lane ends at Commercial Street approximately 250 feet east of Broadway. Parking is allowed on both sides of Sixth Street.

Seventh Street

Seventh Street is a 44-foot-wide, one-way, eastbound, two-lane roadway through downtown Eureka starting at Broadway. Parking is allowed on both sides of Seventh Street. It is a designated bike route with an eastbound bike lane starting at Broadway. There is no signal at Seventh Street and Broadway.

Second Street

Second Street is a 44-foot-wide, east-west, two-lane street east of Commercial Street. West of Commercial Street, Second Street is a private unimproved street. The street terminates at M Street to the east and the intersections are not signalized. The side streets are stop-controlled and parking is allowed on both sides.

14th Street

14th Street is a 38-foot-wide, east-west, two-lane street east of Broadway and 40 feet wide west of Broadway. The westbound approach widens to 46 feet at Broadway with a through lane and a left-turn lane. The eastbound approach widens to 52 feet at Broadway with one right-turn, one through, and one left-turn lane. Generally, parking is allowed on both sides of the street.

Fairfield Street

Fairfield Street is a 36-foot-wide, north-south, two-lane street ending at the intersection of Broadway and Wabash Avenue on the north end. Parking is allowed on both sides of the street.

Waterfront Drive

Waterfront Drive is a 48-foot wide, two-lane street that parallels the shoreline of Humboldt Bay and serves the marina. It currently extends from Washington Street to join and become First Street just east of C Street. First Street then continues east to H Street. Waterfront Drive begins again at J Street and continues easterly to T Street. Parking is generally allowed, but few if any vehicles are found parked along Waterfront Drive because off-street lots at buildings along Humboldt Bay accommodate most of the observed parking demand. Waterfront Drive becomes Railroad Avenue just north of 14th Street.

Wabash Avenue

Wabash Avenue is a 51-foot-wide, two-lane street extending from Railroad Avenue on the west (near the shoreline of Humboldt Bay) through Broadway to H Street. At Broadway, eastbound Wabash Avenue has a sharp right-turn lane (to southbound Broadway), a through-right lane (to Fairfield and eastbound Wabash) and a left-turn lane. Westbound Wabash Avenue at Broadway has a left-turn lane and a through-right lane. Parking is allowed on both sides of Wabash Avenue west of Koster Street and east of Spring Street.

Koster Street

Koster Street is a 44-foot-wide, two-lane street extending as a two-way street from Washington Street (near the project site) on the north to Wabash Avenue on the south. The short segment to the south between Wabash Avenue and Broadway at Del Norte is a one-way northbound, two-lane street. Southbound traffic on Koster Street must turn right or left at Wabash Avenue. Parking is allowed on both sides of Koster Street.

Henderson Street (Harris Street)

Henderson Street is a 44-foot wide, two-lane, two-way traffic street between Broadway and Fairfield Street. It extends uphill from Broadway to Fairfield where all eastbound traffic must turn left or right onto Fairfield Street. East of Fairfield Street, Henderson Street is one-way westbound and part of a couplet with Harris as the eastbound street. The Henderson/Harris couplet serves the Henderson Center shopping area that includes a Safeway and other shops. At Broadway, Henderson Street widens to two westbound approach lanes and one eastbound lane, with one westbound lane only for left turns, with the adjacent westbound lane as a shared left-turn, through, and right-turn lane. The eastbound approach is from a private parking lot. The signal operation is approach phasing for Henderson and the private eastbound approach. Parking is not allowed on Henderson Street between Fairfield Street and Broadway.

Transit Systems

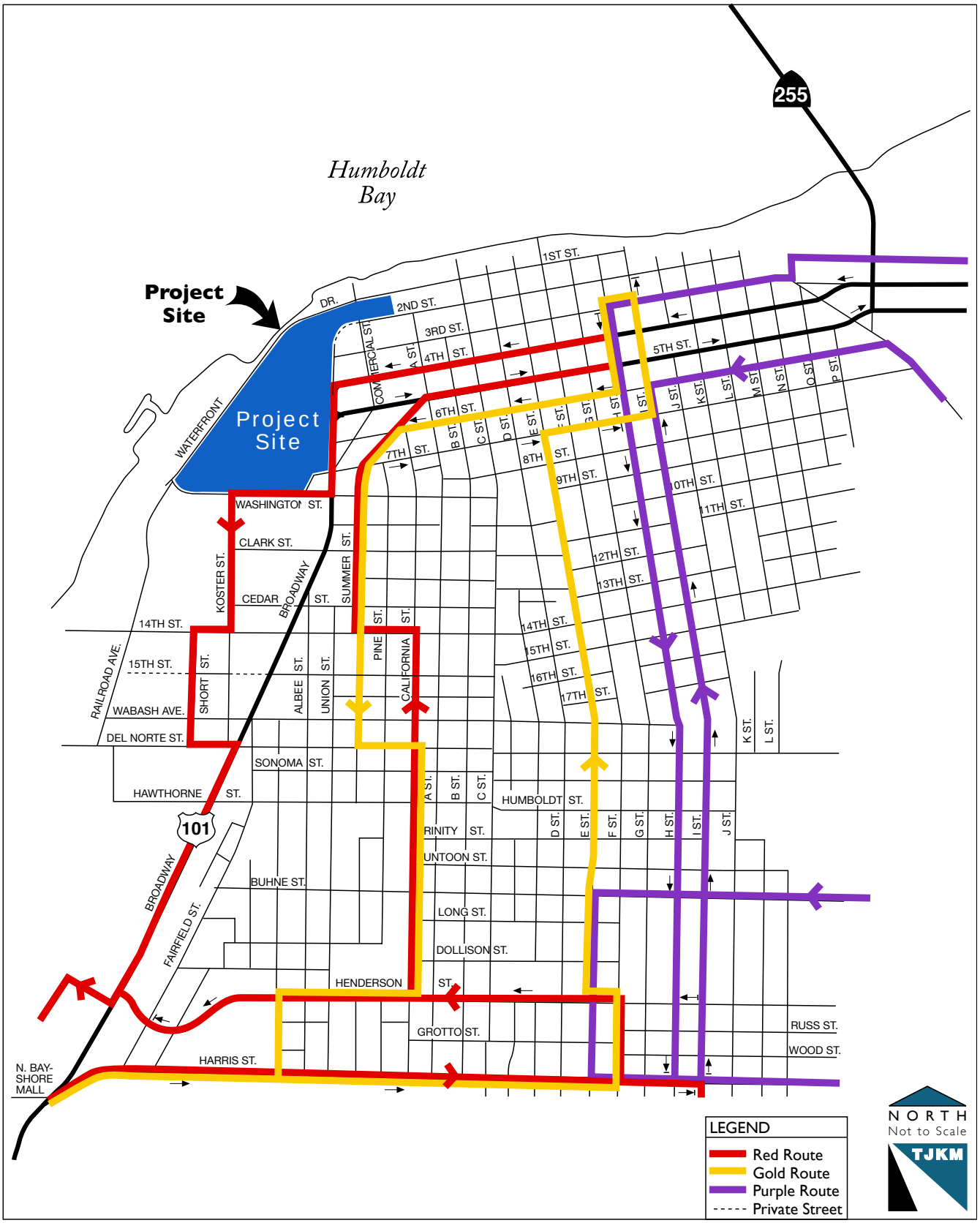
The Humboldt Transit Authority operates local transit service 7 days a week within Eureka. There are four routes: Red, Green, Gold, and Purple. The Red, Gold, and Purple routes are within the vicinity of the project site (see Figure IV.O-2). The Red line, which adjoins the site, operates along Fourth and Fifth streets and along Broadway to Washington Street. It then turns on Washington and extends to Koster Street for southbound service. Northbound service is along Summer Street (parallel to Broadway approximately 500 feet east). The service operates from 6:15 a.m. until 7:00 p.m. with one-hour headways.

The Redwood Transit System operates the regional transit service between Trinidad and Scotia through Eureka. The service operates on three-hour headways for the entire route, and offers more frequent, approximately one-hour headways between the Arcata Transit Center (about 9 miles north of the project site) and the Bayshore Mall (two miles south of the project site). In the vicinity of the project site, southbound service starts around 9:40 a.m. and ends at 6:15 p.m., and northbound service starts around 9:45 a.m. and ends at 5:55 p.m.

Pedestrian Network

Generally, sidewalks exist along both sides of most roadways at and between the study intersections. Sidewalk widths generally vary from 6 feet to 12 feet. Marked crosswalks are provided at all signalized intersections and at many two-way stop intersections. All crosswalks at signalized intersections have pedestrian signals and push buttons. However, the complex turning lanes and one-way pattern of U.S. 101 on Broadway at Fourth and Fifth streets creates difficulties for pedestrians trying to cross traffic flows. Pedestrians are prohibited from crossing the south leg of Broadway at Sixth Street and at Fourth Street, and sight distance for crossing Fifth Street due to the turn from Broadway to eastbound Fifth Street is not ideal. A pedestrian crosswalk is provided across Broadway on the north leg of Broadway from the island separating southbound left turns (to Fifth Street) and southbound through traffic. There is a six-foot-wide sidewalk on the east side of Waterfront Drive from Washington Street to the north. Sidewalks are generally available on both sides of Broadway, with a missing section on the east side from just north of Henderson Street extending approximately 850 feet north.

The downtown grid of streets with sidewalks east of the project site offers convenient pedestrian circulation. In downtown, the flow of traffic along the one-way couplets of Fourth/Fifth streets and Sixth/Seventh streets is periodic, with heavy platoons of traffic for 30 to 40 seconds and then a relative absence of traffic for about 20 to 30 seconds. These gaps in traffic flow allow relatively safe pedestrian crossings of even heavily trafficked streets. At Broadway, the downtown grid of streets is interrupted by the project site between Washington Street and Commercial Street / Waterfront Drive. The barrier represented by the existing conditions at the project site prevents pedestrian access between downtown and the waterfront for almost one-half mile between Washington Street / Waterfront Drive and Waterfront Drive / Commercial Street.



Marina Center Mixed-Use Development Project . 205513

SOURCE: TJKM Transportation Consultants

Figure IV.O-2
Bus Transit Routes

Pedestrian travel along Broadway south of Washington Street is not ideal because of the high volume of traffic as well as high driveway volumes. Crossings of Broadway are difficult at unsignalized intersections. At signalized intersections, pedestrian crossings of Broadway are not ideal because of the high volumes of left and right turns. Curb ramps are generally available at the study intersections. The angled intersections of Broadway at Wabash Avenue and Fairfield Street result in very long crosswalks.

Bicycle Network

Types of Bicycle Facilities

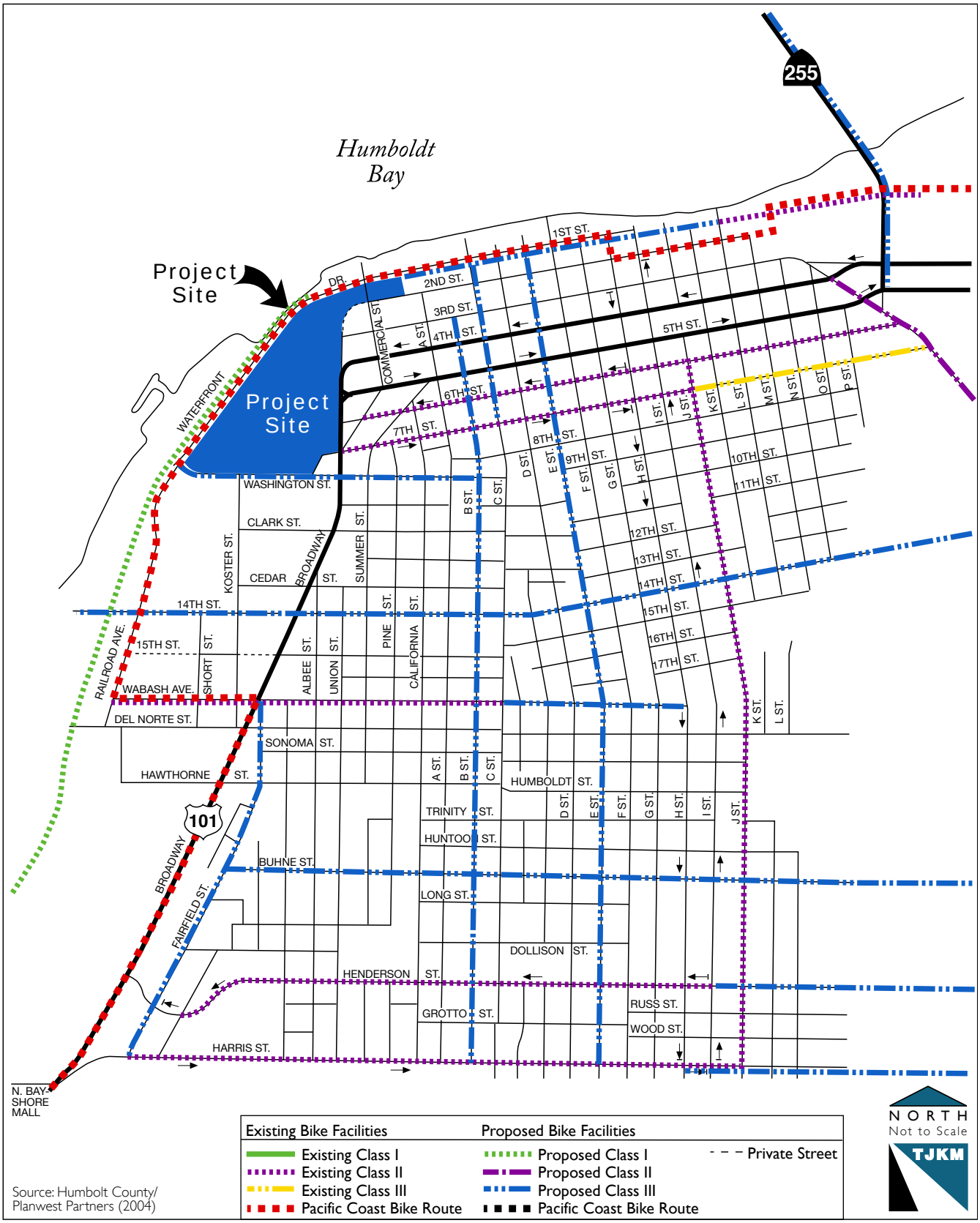
Bicycle facilities are comprised of bike paths, bike lanes, and bike routes. Bike paths (Class I) are paved trails that are separated from the roadways. Bike lanes (Class II) are lanes on roadways that are designated for use by bicycles by striping, pavement legends, and signs. Bike routes (Class III) are roadways that are designated for bicycle use with signs. The City of Eureka has classified existing and proposed bicycle facilities throughout the city (see Figure IV.O-3).

Existing Bicycle Circulation

There are Class II bike lanes on both Sixth Street and Seventh Street from Broadway through downtown to Myrtle Avenue. The Class II bike lane on Sixth Street ends at Commercial Street east of Broadway. Class II bike lanes are also provided on Wabash Avenue between C Street on the east and Railroad Avenue on the west, excepting the section between Spring Street and Koster Street one block either side of Broadway. The Pacific Coast Bike Route comes into Eureka from the south along U.S. 101 and Broadway to Wabash Avenue. It then goes west on Wabash Avenue to Railroad Avenue, along Railroad Avenue-Waterfront Drive-First Street to H Street, south to Second Street, east to L Street in the downtown vicinity, north to Waterfront Drive, east to T Street, south to First Street, east to V Street, and south to Fourth/Fifth Streets. The Pacific Coast Bike Route avoids the narrow section of Broadway north of Wabash Avenue.

C Street connecting Waterfront Drive and Second Street is also a designated Class III bike route. There is an existing Class I bike path south through the Eureka Marsh from Del Norte Street. East of the Old Town Boardwalk there are existing bike lanes all the way to the State Route 255 bridge to Indian Island and the Samoa Peninsula. State Route 255 is shown as a Class III bike route in the Regional Bicycle Transportation Plan.

Bicycle travel along Broadway is problematic and difficult because of the relatively narrow curb lanes north of Wabash Avenue as well as the large number of driveways. South of Del Norte, the striped shoulder coupled with the almost complete lack of on-street parking affords some convenience to bicycle travel, but the high volumes of traffic along Broadway along with the relatively high speeds of 40 mph and more contribute to a relatively low level of comfort and increased hazard for most bicyclists. The Pacific Coast Bike Route avoids the narrow sections of Broadway from Wabash Avenue to Fourth Street.



SOURCE: TJKM Transportation Consultants

Marina Center Mixed-Use Development Project . 205513

Figure IV.O-3
Bicycle Routes

On-Street Parking

On-street parking is generally permitted on the street segments between study intersections, excepting Broadway on both sides from Fifth Street to Wabash Avenue. Between Fourth Street and Fifth Street on the east side of Broadway, parking is permitted. On Wabash Avenue between Koster Street on the west to Spring Street on the east, parking is prohibited. Parking is also prohibited on both sides of Henderson Street between Broadway and Fairfield Street, on Fourth Street east of V Street, and on Fifth Street east of Myrtle Avenue. Otherwise, parking is generally allowed on other streets in the project site vicinity.

Few parked vehicles were observed on Broadway, south of Wabash Avenue on Tuesday, February 28, 2006 and Wednesday, March 1, 2006. Between Henderson Street and Wabash Avenue, only six cars were parked along the east side, and three cars were parked along the west side just after noon. The same held true at 3:00 p.m. with minor changes in the numbers. During the noon hour, the east side of Broadway between Fourth and Fifth streets had a parking occupancy rate of 70 percent, but by 3:00 p.m. there were only two cars parked at the curb. The parking demand is related to the restaurant at Broadway and Fifth Street, which has off-street parking. On-street parking is used because it is more convenient to some customers. The Best Western Motel at this same location allows restaurant customers to park in their spaces as well. Table IV.O-1 shows parked cars and percentage parking occupancy by street segment on Broadway by time of day. Overall, there is little demand for on-street parking because all uses have off-street parking available.

TABLE IV.O-1
ON-STREET PARKING OCCUPANCY ON BROADWAY

	9:00 a.m.		Noon/1:00 p.m.		3:00 p.m.		5:00 p.m.	
Broadway Section	**East Side**	**West Side**	**East Side**	**West Side**	**East Side**	**West Side**	**East Side**	**West Side**
Wabash to Henderson	7 (10%)	0	6 (8%)	3 (5%)	6 (8%)	2 (5%)	6 (8%)	1 (2%)
Fourth to Fifth Street	4 (60%)	prohibited	5 (70%)	prohibited	2 (30%)	prohibited	2 (30%)	prohibited
Second to Fourth St.	4 (30%)	2 (15%)	2 (15%)	0	2 (15%)	0	0	0

NOTE: Percentage parking occupancy is shown in parentheses

SOURCE = TJKM Transportation Consultants (2007)

Traffic Analysis

Existing Levels of Service

Twenty-seven existing intersections and one future study intersection were selected for analysis. Figure IV.O-1 shows the locations of these intersections. Of these 27 intersections, project-generated traffic would result in significant impacts at four in the year 2010. Assuming the

project is implemented in 2010 with all recommended mitigation measures, in the year 2025, the project would result in significant impacts at another four intersections.

The study intersections are as follows:

1. Broadway and Fourth Street
2. Broadway and Fifth Street
3. Broadway and Sixth Street
4. Waterfront Drive and Fourth Street*
5. Broadway and Washington Street
6. Broadway and 14th Street
7. Broadway and Wabash Ave/Fairfield Street
8. Broadway and Del Norte Street
9. Broadway and Hawthorne Street
10. Broadway and Henderson Street
11. Washington Street and Waterfront Drive
12. Washington Street and Koster Street
13. Waterfront Drive and Commercial
14. Koster Street and 14th Street
15. Wabash Avenue and Koster Street
16. Broadway and Harris Street
17. Commercial Street and Fourth Street
18. Fourth Street and C Street
19. Fourth Street and E Street
20. Fourth Street and F Street
21. Fourth Street and H Street
22. Fourth Street and I Street
23. Fifth Street and C Street
24. Fifth Street and E Street
25. Fifth Street and F Street
26. Fifth Street and H Street
27. Fifth Street and I Street
28. Broadway and Seventh Street

* future intersection

The selection of these intersections occurred over early months of the study. In consultation with the City and Caltrans, it was determined that the intersections of Fourth and H Streets, Fourth and I Streets, Fifth and H Streets, and Fifth and I Streets were the busiest in downtown, so that if project impacts were insignificant at these intersections, intersections further east would have even less effect and need not be studied. The analysis confirmed this assessment. To the south on U.S. 101, the intersection of Harris/North Bayshore Mall access drive and Broadway was determined to be the most likely southern intersection to be affected through consultation with the City and Caltrans. Again, the analysis confirmed this assessment. There are several intersections between the study intersections, most of which are secondary, such as intersections of Broadway and Grant Streets, Broadway and Cedar Streets, and Fifth and A Streets. These intersections are secondary in that they are local access streets with relatively minor volumes. The study intersections fairly represent the “worst case” for such minor intersections, and if the study intersections continue to perform adequately, the secondary intersections are anticipated to perform adequately as well. On this basis, not all intersections along U.S. 101 are included as study intersections.

Until April 2007, no regional forecasting model was available for testing the distribution of project traffic. Once the model was available, it was used to confirm the geographic extent of the traffic impact assessment study intersections. The resulting study intersections have been again confirmed by these later assessments.

Traffic counts for all study intersections were conducted in March 2006 and April 2006 for the morning peak period (7:00 a.m. to 9:00 a.m.) and the evening peak period (4:00 p.m. to 6:00 p.m.) for a weekday. At the same time, counts were made of pedestrian and bicycle volumes by direction at each intersection. In addition, extensive count information from Caltrans count records back to 1990 were used, as well as detailed volume information from recent traffic studies for other development and capital improvements projects in Eureka. Figure IV.O-4 shows the a.m. and p.m. peak-hour volumes at each of the 28 study intersections. Figures IV.O-5 and IV.O-6 provide pedestrian and bicycle volumes respectively at study intersections 1 through 15.

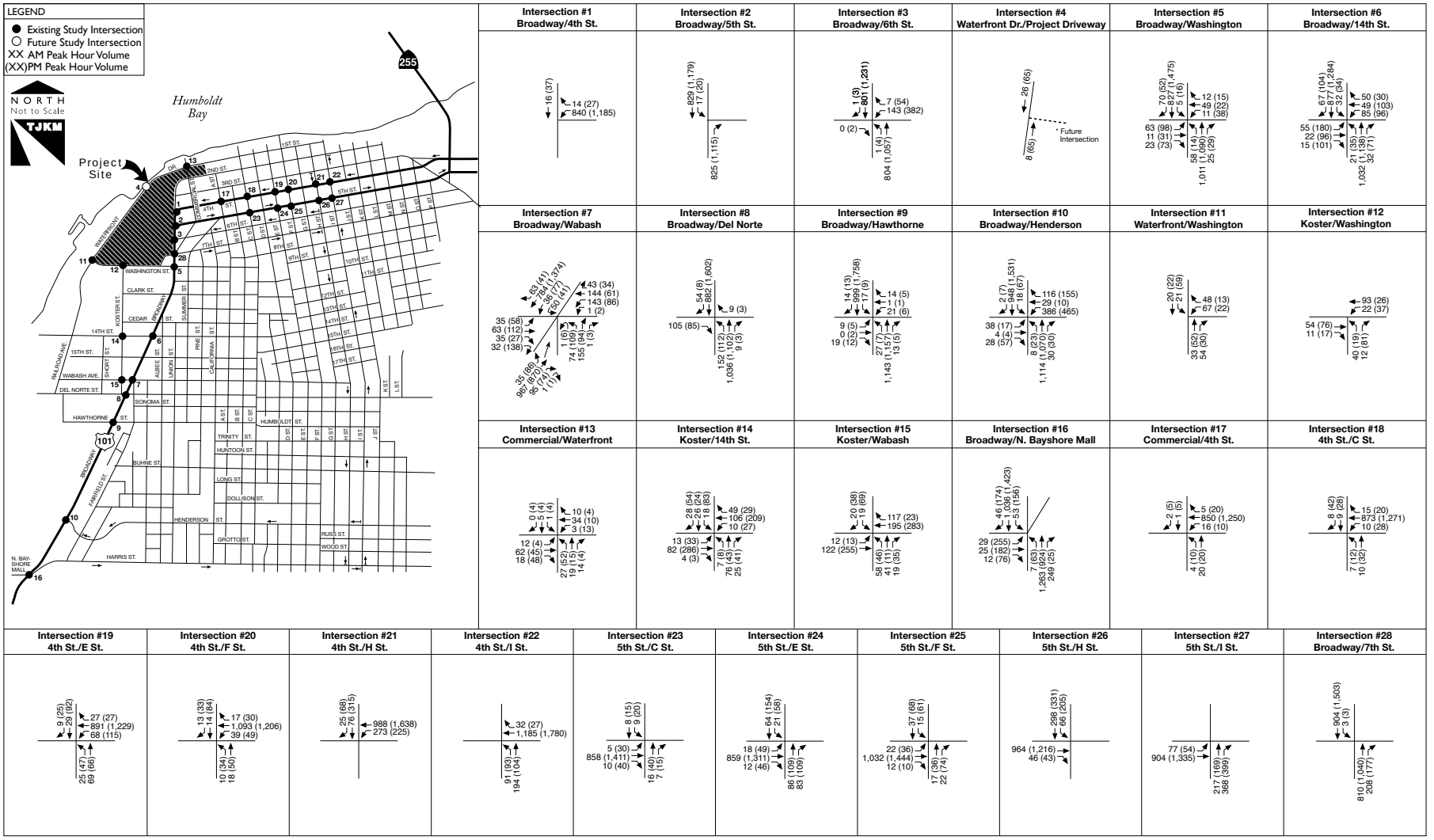
Commercial development typically generates more traffic trips on Saturdays than during the week. Studies referenced in *Trip Generation* (ITE, 2003) show that Saturday trip generation rates for retail centers with more than 300,000 square feet of gross leasable area are 28 percent higher than weekday trip generation rates during the commuter p.m. peak hour. The potential for Saturday volumes to be higher than weekday volumes was evaluated. It was determined that total volumes on Saturday, with the project, will be less than the p.m. weekday commuter peak volumes, with the project, based upon week-long counts conducted by Caltrans on Broadway south of Wabash Avenue. Thus, only weekday a.m. and p.m. peak-hour trips are evaluated in this report. For these reasons, and due to the EIR analysis and mitigations associated with weekday peak volumes, no further analysis of weekend volumes is necessary to evaluate project traffic impacts. Table IV.O-2 summarizes the analysis of Saturday volumes at two study intersections that are affected by the project. By extension, the analysis is valid for all study intersections.

TABLE IV.O-2
SATURDAY AND WEEKDAY PEAK VOLUME COMPARISONS

Location	Movement	Background Volumes		Project Volumes		Background + Project	
		Weekday	Saturday	Weekday	Saturday	Weekday	Saturday
Broadway & Washington	**NB Thru**	1090	828	248	317	1338	1145
	SB Thru	1475	1226	430	550	1905	1776
Broadway & Wabash	**NB Thru**	870	661	169	216	1039	877
	SB Thru	1374	1142	189	242	1563	1384

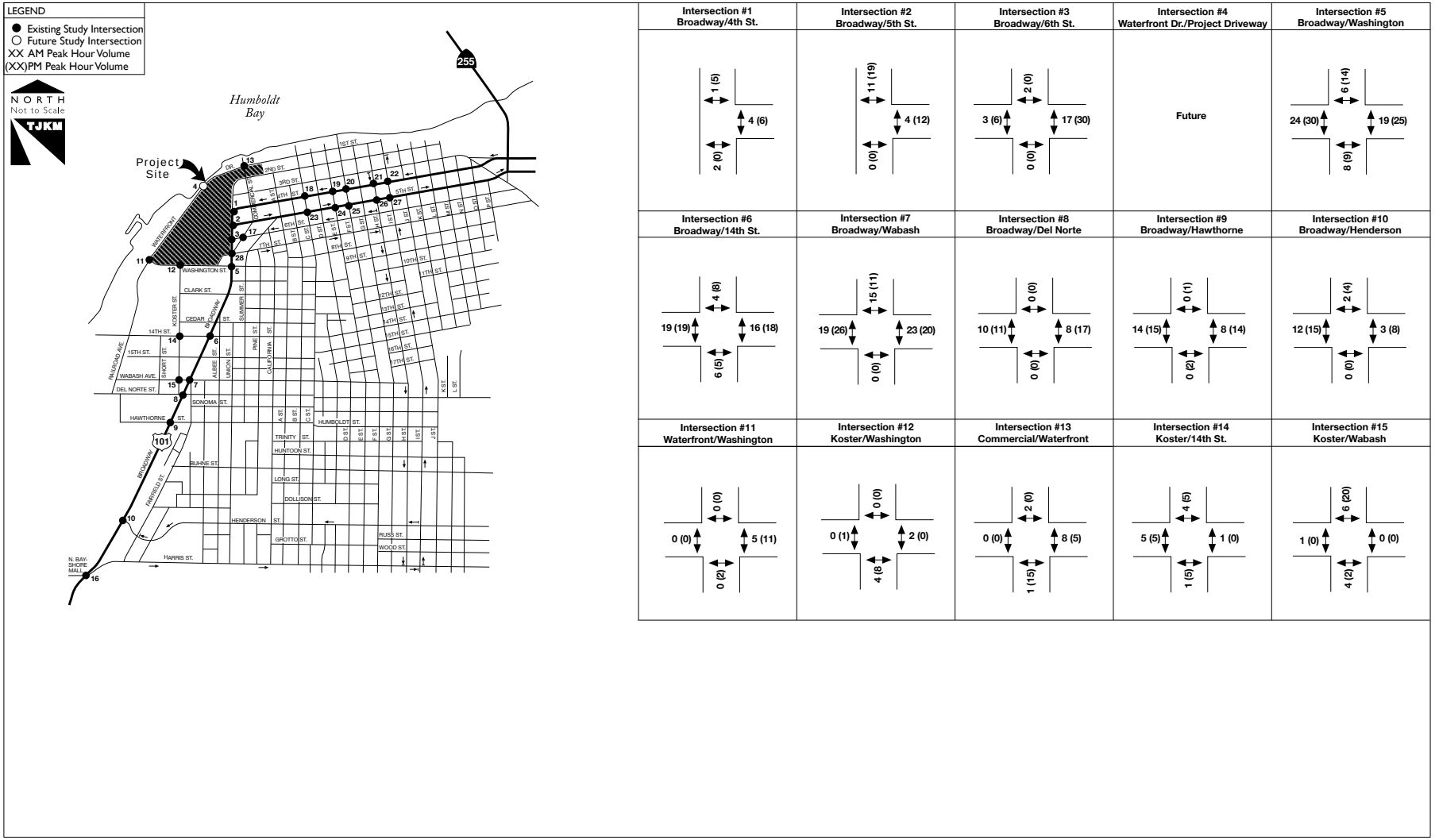
Because the counts were taken over several days, there is normal variation from day to day, and this variation sometimes results in more or less vehicles arriving at an intersection than were sent from an upstream intersection. No adjustments were made to the raw counts. Other reasons for imbalances of volumes between study intersections include driveways and intervening streets where vehicles can turn off and onto routes between study intersections.

Traffic engineers from TJKM surveyed intersection geometry at each of the study intersections. The engineers also made sampling counts of truck volumes, saturation flow rates (for capacity and level of service analysis), whether traffic was distributed generally evenly across multiple approach lanes, influences from driveways, on-street parking, bus stops, and other observations. These observations were used directly in the capacity and level of service analysis. Aerial



SOURCE: TJKM Transportation Consultants

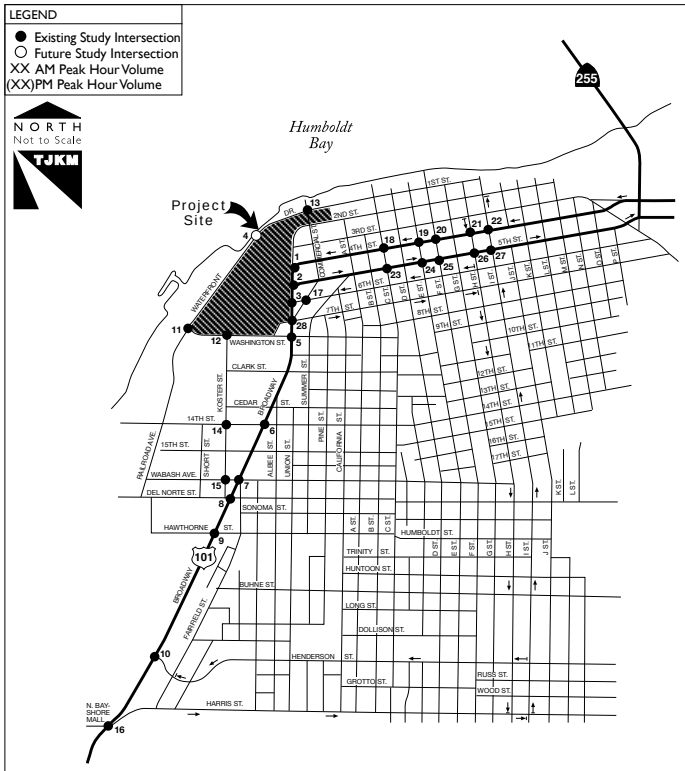
Figure IV.O-4
Existing Turning Movement Volumes



Intersection #1 Broadway/4th St.	Intersection #2 Broadway/5th St.	Intersection #3 Broadway/6th St.	Intersection #4 Waterfront Dr./Project Driveway	Intersection #5 Broadway/Washington
1 (5) 4 (6) 2 (0)	11 (19) 4 (12) 0 (0)	2 (0) 3 (6) 17 (30) 0 (0)	Future	6 (14) 24 (30) 19 (25) 8 (9)
Intersection #6 Broadway/14th St.	**Intersection #7 Broadway/Wabash**	**Intersection #8 Broadway/Del Norte**	**Intersection #9 Broadway/Hawthorne**	**Intersection #10 Broadway/Henderson**
4 (8) 19 (19) 16 (18) 6 (5)	15 (11) 19 (26) 23 (20) 0 (0)	0 (0) 10 (11) 8 (17) 0 (0)	0 (1) 14 (15) 8 (14) 0 (2)	2 (4) 12 (15) 3 (8) 0 (0)
Intersection #11 Waterfront/Washington	**Intersection #12 Koster/Washington**	**Intersection #13 Commercial/Waterfront**	**Intersection #14 Koster/14th St.**	**Intersection #15 Koster/Wabash**
0 (0) 0 (0) 5 (11) 0 (2)	0 (0) 0 (1) 2 (0) 4 (8)	2 (0) 0 (0) 8 (5) 1 (15)	4 (5) 5 (5) 1 (0) 1 (5)	6 (20) 1 (0) 0 (0) 4 (2)

SOURCE: TJKM Transportation Consultants

Figure IV.O-5
Existing Peak Hour Weekday Pedestrian Volumes



Intersection #1 Broadway/4th St.	Intersection #2 Broadway/5th St.	Intersection #3 Broadway/6th St.	Intersection #4 Waterfront Dr./Project Driveway	Intersection #5 Broadway/Washington
2 (5) 4 (2) 0 (0)	4 (4) 2 (2) 0 (0)	0 (0) 0 (1) 10 (11) 0 (0)	Future	3 (2) 5 (4) 5 (12) 0 (0)
Intersection #6 Broadway/14th St.	**Intersection #7 Broadway/Wabash**	**Intersection #8 Broadway/Del Norte**	**Intersection #9 Broadway/Hawthorne**	**Intersection #10 Broadway/Henderson**
0 (2) 3 (4) 13 (7) 2 (2)	4 (12) 8 (3) 7 (8) 0 (0)	0 (0) 4 (6) 7 (3) 0 (0)	0 (0) 3 (7) 5 (3) 0 (0)	0 (1) 2 (3) 3 (3) 0 (0)
Intersection #11 Waterfront/Washington	**Intersection #12 Koster/Washington**	**Intersection #13 Commercial/Waterfront**	**Intersection #14 Koster/14th St.**	**Intersection #15 Koster/Wabash**
0 (0) 0 (0) 4 (7) 2 (2)	0 (0) 0 (0) 0 (1) 3 (2)	0 (2) 0 (0) 1 (1) 5 (4)	2 (1) 0 (0) 2 (4) 0 (3)	3 (2) 0 (1) 1 (0) 1 (2)

SOURCE: TJKM Transportation Consultants

Figure IV.O-6
Existing Peak Hour Weekday Bicycle Volumes

photographs were also used to supplement the field observations. Aerial photos from both the City of Eureka GIS system as well as Google Earth were used to fill in data and information for later analysis.

Field observations were conducted to verify the operation of both signalized and unsignalized study intersections. Traffic engineers observed the existence of pedestrian push buttons, and sampled the average splits and cycle lengths for each signal. All typical intersection operations characteristics were fully documented and were used in analysis of Levels of Service (LOS).

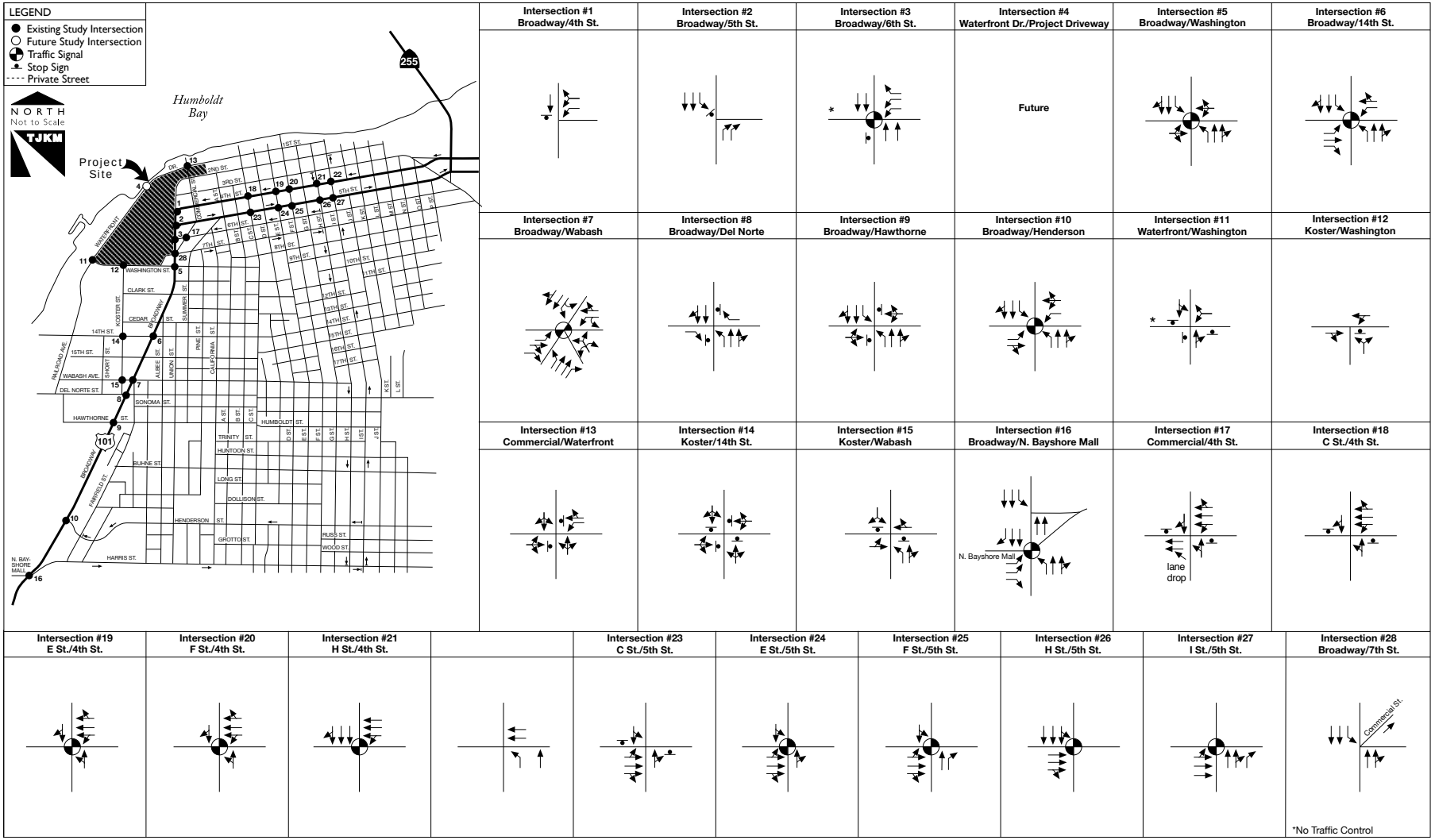
Signals are not coordinated along Broadway as there is no common cycle length north of Henderson Street. The signal timing sheets from Caltrans show coordination along U.S. 101 from Sixth and Broadway east into downtown to E Street, and again from Henderson Street south. There is no coordination between the signals at Henderson Street and Washington Street on Broadway. According to Caltrans, coordination of these signals is not desirable because the complex five-approach intersection of Broadway / Wabash Avenue / Fairfield Street requires such a long cycle length that it is impractical to require the remaining signals between Washington and Henderson Streets to operate at a common cycle length.

Figure IV.O-7 shows the existing lane configurations and traffic control for each of the study intersections. The volumes plus lane geometry and traffic control were all used for the analysis of LOS.

Level of Service Analysis Methodology

The level of service measurement is a qualitative description of traffic operating conditions, including expected traffic conflicts and delay. Level of service categories are based upon quantitative descriptions of traffic operations at intersections or along arterial, highway and freeway segments. Traffic operations are measured in terms of speed, travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and density. Level of service categories are given letter designations ranging from A to F. LOS A indicates free-flow conditions with little or no delay, and LOS F indicates congested conditions with excessive delays and long backups. Various methodologies are used to determine levels of service at specific roadway facilities, including signalized and unsignalized intersections, rural two-lane and multi-lane highways, urban arterials, and freeways.

Signalized and unsignalized intersections were evaluated using the corresponding methodology contained in the *2000 Highway Capacity Manual*, as implemented in the Synchro 6.0 software (TRB, 2000). This methodology reports peak-hour operating conditions as the average control delay for all vehicles entering the intersection. “Control Delay” is an estimate of the extra time spent at an intersection considering the time stopped plus the added time spent in decelerating and accelerating before and after stopping. Detailed descriptions of all the level of service methodologies are on-file and available for review at the City of Eureka Community Development Department.



SOURCE: TJKM Transportation Consultants

Figure IV.O-7
Existing Lane Configurations and Traffic Controls

Results of Level of Service Analysis

Table IV.O-3 summarizes existing peak-hour levels of service at the study intersections. The analysis software was provided with observed input values so that the level of service analysis represents actual conditions. Signal timing sheets, as well as as-built signal plans from Caltrans District 1, were used for existing signal timing.

TABLE IV.O-3
LEVEL OF SERVICE SUMMARY – EXISTING (2006) CONDITIONS

		A.M. Peak Hour		P.M. Peak Hour	
ID	**Intersection**	**Delay**	**LOS**	**Delay**	**LOS**
Signalized Intersections					
3	Broadway and Sixth Street	7.6	A	12.6	B
5	Broadway and Washington Street	12.7	B	16.7	B
6	Broadway and 14th Street	12.1	B	21.3	C
7	Broadway and Wabash Avenue/Fairfield Street	49.4	D	43.9	D
10	Broadway and Henderson Street	**63.0**	**E**	33.6	C
16	Broadway and Harris Street	4.4	A	19.1	B
19	Fourth Street and E Street	4.9	A	7.4	A
20	Fourth Street and F Street	5.1	A	5.4	A
21	Fourth Street and H Street	4.5	A	7.3	A
22	Fourth Street and I Street	11.8	B	10.4	B
24	Fifth Street and E Street	10.6	B	17.8	B
25	Fifth Street and F Street	6.2	A	7.8	A
26	Fifth Street and H Street	10.6	B	8.3	A
27	Fifth Street and I Street	9.9	A	16.3	B
Unsignalized Intersections					
1	Broadway and Fourth Street	**>120.0**	**F**	**>120.0**	**F**
2	Broadway and Fifth Street	11.9	B	14.0	B
4	Waterfront Drive and Fourth Street (project)	–	–	–	–
8	Broadway and Del Norte Street	14.0	B	13.3	B
9	Broadway and Hawthorne Street	**>120.0**	**F**	**> 120.0**	**F**
11	Washington Street and Waterfront Drive	11.6	B	10.8	B
12	Washington Street and Koster Street	3.2	A	9.8	A
13	Waterfront Drive and Commercial Street	10.3	B	10.8	B
14	Koster Street and 14th Street	9.4	A	14.8	B
15	Wabash Avenue and Koster Street	14.7	B	19.9	C
17	Commercial Street and Fourth Street	19.9	C	31.4	D
18	Fourth Street and C Street	**>120.0**	**F**	**88.5**	**F**
23	Fifth Street and C Street	24.6	D	**98.7**	**F**

NOTES: Delay = Control Delay in Seconds per Vehicle, LOS = Level of Service
X.X = Average Intersection Delay in seconds per vehicle (for signalized intersections) OR
Average Delay in seconds per vehicle for the worst minor approach (for unsignalized intersections)

SOURCE: TJKM Transportation Consultants (2007)

All the signalized intersections currently operate acceptably, with the exception of Broadway at Henderson Street in the a.m. peak hour. Unsignalized intersections also operate acceptably at LOS D or better, except Broadway and Fourth Street, Broadway and Hawthorne Street, Fourth Street and C Street, and Fifth Street and C Street. Only the worst level of service on the minor leg of a side-street stop-controlled intersection is reported. Traffic on the main street that does not stop operates with little or no delay. At Fourth and Broadway, for example, just the southbound

approach operates at a poor level of service due to the large westbound to southbound non-stopping flows from Fourth Street to Broadway. Southbound Broadway traffic volumes subjected to LOS F conditions are 16 vehicles and 37 vehicles in the a.m. and p.m. peak hours, respectively. The through flows on the one-way couplet (860 and 1,250 vehicles in the a.m. and p.m. peak hours, respectively) operate at LOS A.

In micro-simulation model runs along the Broadway corridor, average travel speeds on Broadway in the a.m. peak hour are 26 mph northbound and 25 mph southbound, and in the p.m. peak hour, 22 mph northbound and 19 mph southbound. Travel times from Fourth Street and I Street to the Bayshore Mall (Harris Street) run between 5 minutes 54 seconds (25 mph) and 7 minutes 26 seconds (19 mph), while northbound over the same distance, the trip takes between 5 minutes 26 seconds (26 mph) and 6 minutes 15 seconds (22 mph). The micro-simulation model closely estimates average travel speeds and time along the entire route.

Accident Analysis

The Statewide Integrated Traffic Records System (SWITRS) collision data from January 2000 to September 2005 were obtained from the California Highway Patrol. Collision data were summarized for the study intersections in the City of Eureka, including a collision diagram, type-of-collision pie chart, and type-of-violation pie chart.

From the collision diagrams, the signalized intersections of Broadway and 14th Street, Broadway and Wabash Street, and Broadway and Henderson Street show a high incidence of rear end collisions on the northbound and southbound approaches, and project traffic will be adding to traffic on these approaches. Caltrans has developed a procedure within the Highway Incident Safety Program ("HISP") for estimating reductions in accidents as a result of a wide range of highway improvements. For the types of improvements represented by the mitigation measures for the Balloon Track (new signals, upgraded signals, interconnect and signal coordination), the expected reduction in accidents overall is 15 percent. The study intersections that will likely experience reductions in accidents were analyzed using Caltrans worksheets. It is estimated that there will be 11.4 fewer accidents per year at the study intersections on the basis of the traffic mitigation proposed when Marina Center is fully developed.

Environmental Analysis

Significance Criteria

For the purposes of this EIR, implementation of the proposed project would have a significant effect on transportation if, based on Appendix G of the CEQA Guidelines, it would:

1. Cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);

2. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;

3. 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;

4. Substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

5. Result in inadequate emergency access;

6. Result in inadequate parking capacity;

7. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks); or

8. Contribute to adverse cumulative increases in traffic at local intersections in the project area in 2025.

Regulatory Framework

The following are standards and regulations that govern transportation, and by which impacts are measured.

Caltrans

Caltrans has authority over the state highway system, including mainline facilities and interchanges. Caltrans must be involved in and approve the planning and design of all improvements involving state highway facilities. State highway facilities in the project site vicinity include U.S. 101 (i.e., Broadway and the Fourth/Fifth Street corridor). An encroachment permit must be obtained for all work completed in the Caltrans right-of-way.

General Plan and Local Coastal Program

The City of Eureka's adopted General Plan and adopted Local Coastal Program together formalize a long-term vision for the physical evolution of Eureka, and they outline the policies, standards, and programs that guide day-to-day decisions concerning Eureka's development in the coastal zone. The Policy Consistency Analysis, found in Section IV.I, *Land Use and Planning*, provides an evaluation of the Marina Center project's conformity with the policies of the adopted General Plan and Land Use Plan portion of the adopted Local Coastal Program.

Coastal Zoning Regulations

The Coastal Zoning regulations, which implement the policies of the Land Use Plan portion of the adopted Local Coastal Program, are codified in Chapter 156 of the Eureka Municipal Code (EMC), and are also referenced as Article 29, Part 1, Section 10-5.29 et. seq. of the zoning regulations of the City for the coastal zone.

Zoning Regulations

The Zoning Regulations of the City of Eureka are found in Chapter 155 of the EMC and are adopted pursuant to the City Charter to protect the public health, safety, peace, comfort, convenience, prosperity and general welfare.

Project Impacts

Impact O-1: Would the Marina Center project cause an increase in traffic, which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?

Temporary Impacts

Project construction activities would generate off-site traffic that would include the initial delivery of construction vehicles and equipment to the project site, the daily arrival and departure of construction workers, and the delivery of materials throughout the construction period and removal of construction debris. Deliveries would include shipments of concrete, lumber, and other building materials for on-site structures, utilities (e.g., plumbing equipment and electrical supplies), and paving and landscaping materials.

Construction-generated traffic would be temporary and therefore would not result in any long-term degradation in operating conditions on roadways in the project site vicinity. The impact of construction-related traffic would be a temporary and intermittent lessening of the capacities of streets in the project site vicinity because of the slower movements and larger turning radii of construction trucks compared to passenger vehicles. However, given the proximity of the project site to regional roadways (i.e., U.S. 101), construction trucks would have relatively direct routes. Most construction traffic would be dispersed throughout the day. Thus, the temporary increase would not significantly disrupt daily traffic flow on roadways in the project site vicinity in the long term.

Although the impact would be temporary, truck movements could have an adverse effect on traffic flow in the project site vicinity. As such, the impact is considered to be potentially significant.

Long Term Impacts

In Eureka, significant traffic impacts at the study intersections are defined to occur when the addition of project traffic causes operations to deteriorate from an existing acceptable level of LOS C or better to an unacceptable level of LOS D or worse, except at Caltrans-maintained study intersections (e.g., Broadway, Fourth and Fifth streets), where a significant impact would occur if project traffic causes operations to deteriorate from an acceptable level of LOS D or better to an unacceptable level of LOS E or worse.[1] If the intersection is operating unacceptably under

[1] The City of Eureka's Circulation Element identifies the minimum level of service for City intersections as LOS C, while the minimum level of service for all intersections along U.S. 101 is LOS D. (See State of California, Department of Transportation, *Guide for the Preparation of Traffic Impact Studies* (December 2002).)

conditions without the project, and the addition of project trips causes the average delay to increase by 5 or more seconds, the project would be considered to have a significant traffic impact at that intersection. These significance criteria are defined by the City of Eureka and by Caltrans, and apply to all development projects in the city for near-term future scenarios with a development project as well as for long-term cumulative future scenarios.

Existing volumes at the study intersections were extrapolated to the expected opening in 2010, and represent Baseline Conditions. Baseline Conditions present a more realistic picture of traffic conditions on area roadways at the time of project occupancy than Existing Conditions, as the project would take several years to be permitted and constructed.

Baseline Conditions are estimated by extrapolating existing turning movement counts to the expected opening of the proposed project in 2010. Traffic volumes on roadways in the project vicinity have increased by 1.5 percent per year over the past 30 years. From 2006 to 2010, traffic volumes are expected to increase at a similar rate (i.e., to be 6 percent over existing conditions in 2010 without the project).

The 2010 Baseline Conditions street network remains the same as under Existing Conditions because there are no identified traffic improvements funded in local capital improvements programs or in the State Transportation Improvement Program (STIP). Figure IV.O-8 presents the resulting traffic volumes for 2010 Baseline Conditions. Operating conditions at the study intersections under 2010 Baseline Conditions are presented in Table IV.O-4

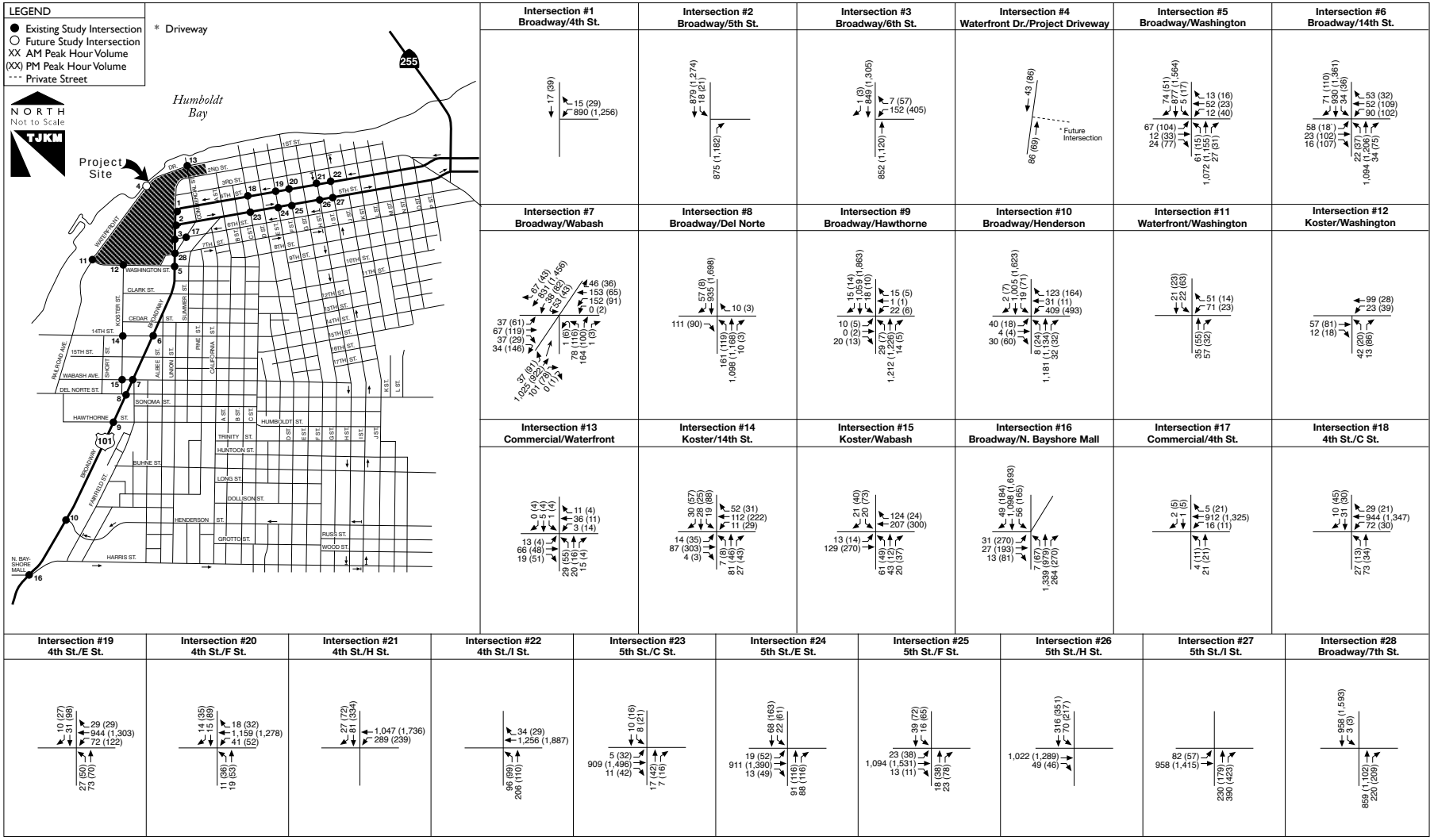
Under 2010 Baseline Conditions (without the additional vehicle trips to or from the project), six of the study intersections are anticipated to operate unacceptably. The intersection of Broadway and Henderson Street would operate at LOS E during the a.m. peak hour. The intersection at Broadway and Hawthorne Streets, and the intersection at Broadway and Fourth Streets would each operate at LOS F during a.m. and p.m. peak hours. The intersections at C and Fourth Streets and C and Fifth Streets would each operate at LOS F during the p.m. peak hour. The intersection at Commercial and Fourth Streets would operate at LOS E during p.m. peak hour (Table IV.O-4).

Trip Generation

The vehicle trip generation analysis for the proposed project addresses the multiple land uses proposed for the site. The retail components would attract some traffic already passing by the site along Broadway. Likewise, due to the combination of retail, office, residential, light industrial, restaurant and museum uses on the site, a limited proportion of trips generated by these uses would begin and end entirely within the site. These are “captured trips” in that they would not use off-site streets or contribute to traffic impacts at the study intersections.

Table IV.O-5 shows the trip generation analysis for the proposed project. For an entire weekday the proposed project is expected to result in an additional 15,666 vehicle trips on area roads.

A “trip” is defined as having an origin and a destination, and is not a round trip. Therefore, the proposed project would generate an estimated 7,833 daily round trips. Trip generation for the weekend would be lower at most of the uses, and higher at Home Depot and additional retail



SOURCE: TJKM Transportation Consultants

Figure IV.O-8
Baseline 2010 Turning Movement Volumes

TABLE IV.O-4
LEVEL OF SERVICE SUMMARY – 2010 BASELINE CONDITIONS (WITHOUT PROJECT)

ID		2010 Baseline (Without Project)			
		A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
Signalized Intersection					
1	Broadway and Fourth Street	**>120**	**F**	**>120**	**F**
3	Broadway and Sixth Street	7.8	A	13.4	B
5	Broadway and Washington Street	13.7	B	18.9	B
6	Broadway and 14th Street	12.7	B	23.3	C
7	Broadway and Wabash Avenue/Fairfield Street	48.6	D	51.2	D
10	Broadway and Henderson Street	**72.8**	**E**	36.5	D
16	Broadway and Harris Street/Bayshore	4.6	A	20.1	C
19	Fourth Street and E Street	5.0	A	8.1	A
20	Fourth Street and F Street	5.2	A	5.6	A
21	Fourth Street and H Street	4.9	A	7.7	A
22	Fourth Street and I Street	12.2	B	10.9	B
24	Fifth Street and E Street	11.0	B	19.2	B
25	Fifth Street and F Street	6.5	A	8.0	A
26	Fifth Street and H Street	10.9	B	8.9	A
27	Fifth Street and I Street	10.7	B	16.8	B
Unsignalized Intersection					
2	Broadway and Fifth Street	12.2	B	14.6	B
4	Waterfront Drive/Fourth Street (Project)	-	-	-	-
8	Broadway and Del Norte Street	14.6	B	13.8	B
9	Broadway and Hawthorne Street	**>120.0**	**F**	**>120.0**	**F**
11	Washington Street and Waterfront Drive	11.8	B	11.0	B
12	Washington Street and Koster Street	10.1	B	9.9	A
13	Waterfront Drive and Commercial Street	10.4	B	11.0	B
14	Koster Street and 14th Street	9.7	A	16.5	C
15	Wabash Avenue and Koster Street	14.4	B	22.3	C
17	Commercial Street and Fourth Street	21.3	C	**35.3**	**E**
18	Fourth Street and C Street	32.6	D	**73.0**	**F**
23	Fifth Street and C Street	28.2	D	**87.5**	**F**

NOTES: Delay = Control Delay in Seconds per Vehicle, LOS = Level of Service
X.X = Average Intersection Delay in seconds per vehicle (for signalized intersections) OR
Average Delay in seconds per vehicle for the worst minor approach (for unsignalized intersections)

SOURCE: TJKM Transportation Consultants (2007)

uses. Because traffic volumes at the study intersections are lower on weekends, this traffic impact analysis concerns itself only with project impacts on normal, weekday commuter traffic peaks in the morning and evening. The project is estimated to generate about 792 new trips in the a.m. peak hour (535 inbound and 257 outbound), and about 1,369 trips in the p.m. peak hour (576 inbound and 793 outbound). Planned truck operations associated with the home improvement store is estimated to consist of two to three flatbed trucks for lumber deliveries and ten to 15 light duty and semi-trailer trucks daily.

TABLE IV.O-5
PROJECT TRIP GENERATION

Project Land Use	ITE Code	Size[1]	Daily		A.M. Peak Hour				P.M. Peak Hour			
			Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Industrial (Industrial Park)	130	70	25.73	1,801	1.30	75	16	91	1.94	29	107	136
Anchor 1 (Home Improvement Superstore) + Nurseries (Garden Center)	862	152.7	28.26	4,315	1.20	99	84	183	2.45	176	198	374
Additional truck trips in Passenger Car Equivalents (PCE)[2]						5	5	10		5	5	10
Discount for Pass-By Trips (-5% for A.M., -25% for P.M. and -10% for daily trips)[3]				*-432*		*-5*	*-4*	*-9*		*-44*	*-50*	*-94*
Discount for Captured Trips (-5% for daily trips and -15% for p.m. trips)[4]				*-216*						*-26*	*-30*	*-56*
Retail/Service (shopping center)	820	160	57.95	9,272	1.31	128	82	210	5.37	412	447	859
Discount for Pass-By Trips (-10% for daily and p.m. Trips)[3]				*-927*						*-41*	*-45*	*-86*
Discount for Captured Trips (-15% for daily and p.m. trips)[4]				*-1,391*						*-62*	*-67*	*-129*
Office (Westside Office Park)	750	80	14.35	1,148	2.15	153	19	172	2.23	25	153	178
Discount for Captured Trips (-15% for p.m. only)[4]										*-4*	*-23*	*-27*
Office (Northside Office Park)	750	24	14.35	344	2.15	46	6	52	2.23	8	46	54
Discount for Captured Trips (-15% for p.m. only)[4]										*-1*	*-7*	*-8*
Restaurant (Quality Restaurant)	931	12.5	89.95	1,124	0.81	8	2	10	7.49	63	31	94
Discount for Captured Trips (-15% for daily and p.m. trips)[4]				*-169*						*-9*	*-5*	*-14*
Museum[5]	N/A	12	N/A	400	N/A	20	20	40	N/A	20	20	40
Multi-Family Residential (Condominiums/Townhouses)	230	54	7.36	397	0.62	6	27	33	0.71	25	13	38
TOTAL				**15,666**		**535**	**257**	**792**		**576**	**793**	**1,369**

N/A = Not Available; ITE = Institute of Transportation Engineers

1 Size is expressed as 1,000 square feet (KSF), except for the proposed residential use, which is expressed as dwelling units (DU).
2 For Home Improvement Superstore, 20 - 24 truck trips/week are expected. Thus, during a weekday peak hour a maximum of two inbound and two outbound truck trips are expected.
A Passenger Car Equivalent (PCE) of 2.5 passenger cars per truck is assumed. two trucks/peak hour = 2 X 2.5 passenger cars = five passenger cars/hour
3 Discount for Pass-By Trips (AM Peak): Home Improvement Superstore (5%)
Discount for Pass-By Trips (PM Peak): Home Improvement Superstore (25%) and Retail (10%)
4 Discount for Captured Trips (PM Peak): Home Improvement Superstore (15%), Quality Restaurant (15%) and Retail (15%), Office Park (15%)
5 There are no museum trip generation rate estimates in the ITE *Trip Generation* or other reliable sources. Trips are estimated based on number of parking spaces provided (i.e., 20 spaces).

SOURCE: TJKM Transportation Consultants (2007)

Deductions from the total trip generation are made to account for the pass-by trips that are already on the public street system, and for trips made entirely within the site that do not use the off-site street system. All trip generation calculations are made consistent with the Institute of Transportation Engineers standard reference *Trip Generation* (ITE, 2003) and the *Trip Generation Handbook* (ITE, 2001) used for the calculation of pass-by and captured trips. The standard pass-by percentage of 48 percent for the home improvement store in the p.m. peak hour (Table 5.21 "Pass-By Trips and Diverted Linked Trips for Home Improvement Superstore" in the *Trip Generation Handbook*, ITE, 2001) was reduced to 25 percent to estimate a "worst case" analysis.

Project Trip Distribution

The Humboldt County countywide travel model was made available for use in estimating project traffic distribution and assignment to study intersections. However, from August 2005 through April 2007, the travel model was not available, so earlier analyses in working versions of the traffic impact study were based upon a surrogate origin-destination study of the Costco store west of Broadway on Wabash. Trips to and from retail centers are almost constant during the day, from 11:00 a.m. through 8:00 p.m., ranging from 8 percent of daily trips to about 9.5 percent of daily trips in and out for each of those hours (ITE, 2003). It is this hourly consistency that enabled a survey of origin-destination patterns for Costco from 12:00 noon until 5:00 p.m. on a weekday.

The new Humboldt County countywide model is based on the standard four-step traffic forecasting process. The four steps are: 1) trip generation, 2) trip distribution between origins and destinations on the basis of the "gravity model", 3) estimates of modal shares of trips by drive-alone, carpool, transit, and sometimes bicycle, walking and truck modes, and 4) assignment of trips to specific routes between origins and destinations.

The 2005 "Existing Conditions" version of the model was used in this analysis. Prior to use, the model was calibrated to the manual turn counts at the 27 existing study intersections of the traffic impact study. That is, the model origins and destinations were adjusted so that model estimates of turning volumes and link volumes closely replicate the 2006 traffic volumes used in the traffic impact study. Additional adjustments of the model parameters were made, primarily speeds on minor downtown streets such as Second and Third Streets, so that the origin-destination survey results were comparable with the model estimates of trips leaving Costco. The distribution of trips in the DEIR analysis uses the model trip distribution and assignment for the Baseline 2010 + Project scenario, and not the Costco survey. The trip generation for the project in Table IV.O-5 was converted to trip generation parameters used in the model for direct modeling use. The standard four-step demand modeling process was used to generate, distribute and assign project trips to the study intersections.

The traffic impact of the proposed project is estimated on the basis of additional traffic at the study intersections as determined both by trip generation and trip distribution.

In addition to traffic analyses at the study intersections, there was an analysis of which access points would be used to reach the project site. This analysis was based on the trip generation for

the individual project uses and their location, parking supply, and the geographic distribution of trips. These calculations allow reasonable estimates of project traffic at each access point.

Proposed Project Access and Off-site Improvements

As part of the mitigation for the proposed project, one signalized intersection would be constructed to facilitate project access along the U.S. 101 corridor, Broadway at Fourth Street. In addition, the signalized intersection of Broadway at Sixth Street would be modified to include access to the west into the proposed project site.

Part of the modification of Sixth and Broadway may include relocating the southern driveway of Bob's Fine Car Lot. The driveway could be moved to within 75 feet of the northerly driveway. The existing driveway is within the signalized intersection, and within the new western leg into Marina Center and the relocation of the driveway is desirable for adequate traffic flow through the intersection. The modification of the Broadway/Sixth Street signal and intersection also includes restriping Broadway for a northbound left turn lane at the project access drive at Sixth Street, the installation of a raised median extending south of Seventh Street and prohibition of southbound left turns from Broadway to eastbound Seventh Street. Instead, these diverted left turns would be guided to use the southbound left turn lane on Broadway at Washington Street to get to eastbound Seventh Street. The northbound left turn queue at Sixth Street is likely to extend through the Broadway and Seventh Street intersection, so a physical barrier is required to prevent southbound vehicles from turning left through the standing queue, because of the additional hazard this would represent. These changes would divert about three vehicles per hour (an average of one additional vehicle every 20 minutes) from Broadway (U.S. 101) to Summer Street northbound – the block of Summer Street between Washington and Seventh Streets.

Other modifications and improvements that would be constructed as mitigation for the project include restriping, removal of parking along the east curb of Commercial south of Fourth Street within 150 feet of the intersection to provide for a northbound left turn lane plus a northbound through lane at Fourth Street with a new signal, and the erection of guide signs informing drivers how to access Marina Center from northbound Broadway. These modifications and improvements are outlined in the Traffic Impact Study prepared for the project and on-file at the City of Eureka Community Development Department. The engineering for these improvements and modifications would need final approval from Caltrans, the Parking Place Commission, and the City Engineer, and would be part of the project permitting and approval phase.

With the project, the unsignalized intersection of Broadway at Hawthorne would be signalized as mitigation for project impacts at the study intersection of Broadway at Fairfield and Wabash. The signal at Broadway and Wabash and Fairfield would be modified so that northbound traffic on Fairfield no longer enters the intersection, and instead is diverted to access Broadway via Hawthorne. One new intersection also would be created, at Waterfront Drive and the extension of Fourth Street. As a private road within the project, Fourth Street would stop at Waterfront Drive.

The signal improvements for all new signals on U.S. 101 (along Broadway and Fourth Street) can be accomplished within existing right-of-way for the Broadway and Fourth Street, Broadway and Sixth Street, Fourth and Commercial and Broadway and Hawthorne intersections.

Results of the Level of Service Analysis

The results of the LOS analysis with and without the project are presented in Table IV.O-6, and the resulting intersection turning-movement volumes are illustrated in Figure IV.O-9. The Baseline 2010 without project LOS values in Table IV.O-4 are repeated in Table IV.O-6 so that it is easy to directly see project impacts. The project would correct the poor levels of service at Broadway and Fourth Street with the new signal as well as Commercial and Fourth Street. Mitigation at the other intersections is not assumed in Table IV.O-6. The results of mitigating 2010 Baseline Conditions with the project are contained later in this section (Table IV.O-8).

With the addition of project-generated traffic, average delay would increase somewhat at most of the study intersections; however, most would continue to operate at acceptable levels of service. Under 2010 Baseline plus Project Conditions, six of the study intersections would operate unacceptably.

The signalized intersection of Broadway and Henderson Street would continue to operate at LOS E during the a.m. peak hour.[2] The unsignalized intersection of Broadway and Hawthorne Street would continue to operate at LOS F during both peak hours. Both unsignalized intersections of C and Fourth Streets, and C and Fifth Streets would continue to operate at LOS F during the p.m. peak hour.

In addition, the above-cited Fifth Street and C Street intersection would degrade to an unacceptable LOS E during the a.m. peak hour, and two other intersections also would degrade to unacceptable operating conditions with the addition of project-generated traffic. The signalized intersections at Broadway and Wabash/Fairfield Streets, and the unsignalized intersection of Wabash Avenue and Koster Street would degrade to a LOS E during the p.m. peak hour.

Operation Evaluation

Because the proposed project (after implementation of mitigation measures identified herein) would result in several study intersections with closely spaced signals, micro-simulation modeling was also employed to further evaluate operations without and with the project. Micro-simulation provides a more-detailed estimate of the operation of traffic where one signalized intersection may affect operations at another because traffic backs up from the first through the second. Calculation of level of service becomes more complicated under these conditions, and micro-simulation is the best available analysis tool for understanding potential changes in traffic due to new projects and modifications of traffic controls and intersections. Micro-simulation is based upon the operation of each individual vehicle in the traffic stream throughout a network of streets each and every second. The modeling is contained within the software, SimTraffic (there

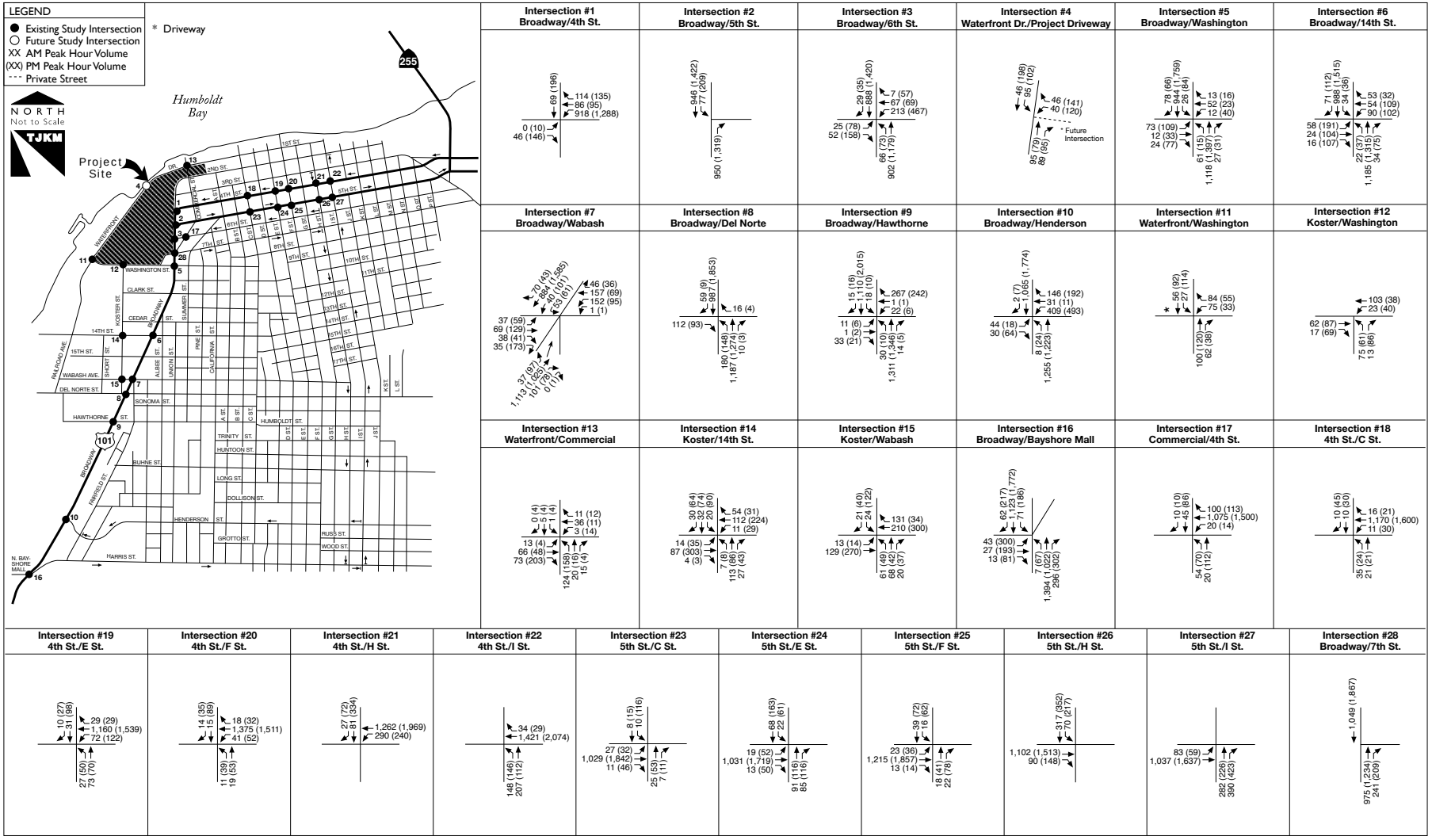
[2] Average delays for some intersections listed in Table IV.O-6 decrease with the project due to the "peak hour factor." The peak hour factor expresses how much traffic may increase for short periods within the peak hour, and is calculated by multiplying the highest 15-minute peak-hour volumes by 4, and then dividing that product into the actual peak hour. The lower the peak hour factor, the higher proportion of total peak hour traffic that occurs during the highest 15-minute period during the peak hour. Corresponding delays may increase under peak-hour conditions. But because project traffic has less variation during the peak hour, the peak hour factor for Henderson and Broadway goes up and the resulting weighted-average delay actually decreases, but not significantly.

TABLE IV.O-6
LEVELS OF SERVICE 2010 BASELINE AND 2010 BASELINE PLUS PROJECT

ID		2010 Baseline (Without Project)				2010 Baseline plus Project			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Signalized Intersection									
1	Broadway and Fourth Street*	**>120**	**F**	**>120**	**F**	6.0	A	16.1	B
3	Broadway and Sixth Street	7.8	A	13.4	B	15.6	B	38.4	D
5	Broadway and Washington	13.7	B	18.9	B	14.4	B	37.3	D
6	Broadway and 14th Street	12.7	B	23.3	C	13.9	B	22.8	C
7	Broadway and Wabash/Fairfield	48.6	D	51.2	D	48.3	D	**72.8**	**E**
10	Broadway and Henderson	**72.8**	**E**	36.5	D	**70.0**	**E**	44.0	D
16	Broadway and Harris/ Bayshore	4.6	A	20.1	C	4.5	A	22.4	C
19	Fourth Street and E Street	5.0	A	8.1	A	5.1	A	8.5	A
20	Fourth Street and F Street	5.2	A	5.6	A	2.7	A	9.7	A
21	Fourth Street and H Street	4.9	A	7.7	A	4.3	A	12.8	B
22	Fourth Street and I Street	12.2	B	10.9	B	8.5	A	11.8	B
24	Fifth Street and E Street	11.0	B	19.2	B	11.8	B	19.0	B
25	Fifth Street and F Street	6.5	A	8.0	A	5.8	A	9.9	A
26	Fifth Street and H Street	10.9	B	8.9	A	9.6	A	11.6	B
27	Fifth Street and I Street	10.7	B	16.8	B	18.9	B	26.2	C
Unsignalized Intersection									
2	Broadway and Fifth Street	12.2	B	14.6	B	11.3	B	19.0	C
4	Waterfront Drive/Fourth St (Project)	-	-	-	-	11.4	B	17.3	C
8	Broadway and Del Norte	14.6	B	13.8	B	18.2	C	17.5	C
9	Broadway and Hawthorne	**>120.0**	**F**	**>120.0**	**F**	**>120.0**	**F**	**>120.0**	**F**
11	Washington and Waterfront	11.8	B	11.0	B	13.9	B	17.2	C
12	Washington and Koster	10.1	B	9.9	A	10.6	B	11.6	B
13	Waterfront and Commercial	10.4	B	11.0	B	9.0	A	9.6	A
14	Koster and 14th Street	9.7	A	16.5	C	9.9	A	20.3	C
15	Wabash and Koster	14.4	B	22.3	C	15.2	C	**41.8**	**E**
17	Commercial and Fourth St*	21.3	C	**35.3**	**E**	5.3	A	15.2	B
18	Fourth Street and C Street	32.6	D	**73.0**	**F**	29.2	D	**>120.0**	**F**
23	Fifth Street and C Street	28.2	D	**87.5**	**F**	**32.8**	**E**	**>120.0**	**F**

Notes: Delay = Control Delay in Seconds per Vehicle, LOS = Level of Service
X.X = Average Intersection Delay in seconds per vehicle (for signalized intersections) OR
Average Delay in seconds per vehicle for the worst minor approach (for unsignalized intersections)

SOURCE: TJKM Transportation Consultants (2007)



SOURCE: TJKM Transportation Consultants

Figure IV.O-9
Baseline 2010 + Project Turning Movement Volumes

are other software packages available that are similar). SimTraffic is integrated with Synchro, the software used to estimate traffic levels of service in this document. The modeling algorithms are based upon research and development by the Federal Highway Administration with respect to driver behaviors (car following, gap acceptance, acceleration and deceleration, lane selection, etc.), traffic control parameters (signal timing, speeds, vehicle volumes, types of vehicles in the traffic stream, etc.), and the street network (the number of lanes, grades, vertical and horizontal curves, etc.). The test of whether a micro-simulation model works is to compare it directly with observed traffic conditions such as the probability of stopping at a signal and average speeds through a group of signals. The model also estimates control delay, the same measure used for level of service determinations, but the primary use is to assure the analyst that the system of signalized intersections will work as designed. The details of how well the micro-simulation models estimate existing conditions is contained in the traffic impact study on-file with the City of Eureka Community Development Department. The micro-simulation model used for this study was found to estimate traffic conditions very close to observed conditions in terms of average travel times between signals and the number of stops.

Table IV.O-7 summarizes the results of micro-simulation modeling for the a.m. and p.m. peak hours under existing and 2010 conditions. Modeling for the project scenario simulated 2010 Baseline + Project Conditions, which included project mitigation identified in this chapter. There are several specialized performance measures in Table IV.O-7 that are explained below.

The first performance measure is “vehicle miles of travel” (VMT). This is an excellent comparative measure of the magnitude of traffic demand. One vehicle traveling for 1 mile is 1 vehicle mile of travel. From Existing Conditions, Baseline 2010 Conditions show an increase in traffic of 9 percent in the a.m. peak hour, and 5 percent in the p.m. peak hour on U.S. 101 through Eureka. Adding the Marina Center project increases Baseline 2010 traffic again by 6 percent in the a.m. peak hour and by 14 percent in the p.m. peak hour. The overall increase in traffic on U.S. 101 with Baseline 2010 plus Project Conditions is 15 percent in the a.m. peak hour and 20 percent in the p.m. peak hour.

Another primary measure of system performance in Table IV.O-7 is “vehicle hours of travel” (VHT). For example, if it takes 10 minutes for one car to travel from I Street downtown to Bayshore Mall, it would take six cars traveling this distance to constitute 1 vehicle hour of travel. The faster the trip can be made, the faster the speed. In some instances, with traffic improvements it is possible to reduce vehicle hours of travel even as total VMT climbs. Dividing VMT by VHT results in a direct estimate of speed in terms of miles per hour. These performance measures are provided in Table IV.O-7.

According to Caltrans’ LOS criteria, the average traffic speeds in the a.m. peak hour would not be significantly affected with the addition of the proposed project with all recommended mitigation for Baseline 2010 + Project. During the a.m. peak hour with the project in 2010, the average speed on U.S. 101 from I Street in downtown south to the Bayshore Mall would drop from the current 26.3 mph to 21.6 mph with the project. The increased travel time for either direction is approximately 1 minute 19 seconds. In the a.m. peak hour without the project, the increased

TABLE IV.O-7
A.M. PEAK HOUR MICRO-SIMULATION RESULTS

Section	Street	Dir	Intrsction	Existing a.m. peak VMT	Existing a.m. peak VHT	Existing a.m. peak Stops/Veh	Baseline a.m. Peak VMT	Baseline a.m. Peak VHT	Baseline a.m. Peak Stops/Veh	Mitigated Baseline + Project a.m. peak VMT	Mitigated Baseline + Project a.m. peak VHT	Mitigated Baseline + Project a.m. peak Stops/Veh	Exist/ Baseline VMT	Baseline/ Project VMT
Downtown	**4th**	**WB**	H	65.6	3.2	0.08	71.3	3.6	0.1	84.9	4	0.1		
			F	112.6	4.5	0.06	123	4.9	0.06	146.1	5.4	0.04		
			E	53.7	2.1	0.01	58.9	2.4	0.02	70.8	2.7	0.03		
			C	96.7	3.4	0.05	106.7	3.7	0.05	132.4	5.9	0.26		
			Broadway	126.5	4.8	0.03	140.2	5.4	0.04	299.8	13.1	0.5		
	5th	**EB**	C	205	7.3	0.03	217.7	0.07	0.1	310.5	12.6	0.29		
			E	92.8	4.6	0.12	100	5.1	0.39	112.6	6	0.33		
			F	59	2.9	0.11	62.7	3.1	0.11	70.4	3.6	0.15		
			H	106	4	0.03	111.5	4.2	0.02	120.2	4.8	0.05		
			I	60.9	2.6	0.05	63.8	2.7	0.06	70.3	3.4	0.12		
	totals			**978.8**	**39.4**	**0.57**	**1055.8**	**35.17**	**0.95**	**1418**	**61.5**	**1.87**	107.9%	134.3%
	Avg Spd	**WB**	4th		**25.3**			**25.0**			**23.6**		98.9%	94.4%
		EB	5th		**24.5**			**36.6**			**22.5**		149.7%	61.4%
Balloon	**Broadway**	**SB**	5th	52.1	2.2	0	56.7	2.4	0	61.6	3.5	0.13		
			6th	27.4	1.7	0.23	30.6	2.1	0.25	77.3	4.7	0.17		
			7th	48.9	1.9	0	54.5	2.2	0	46.7	2.3	0.05		
			Wshgtn	46.8	3.5	0.37	52.2	4.2	0.39	51.1	2.9	0.16		
		NB	7th	41.4	1.9	0.01	44.2	2.1	0.01	47.8	2.8	0.15		
			6th	47.1	2.6	0.26	50.6	3	0.29	53.1	5.7	0.4		
			5th	15.6	1.2	0.03	16.8	1.3	0.04	14.7	1.4	0.1		
	totals			**279.3**	**15**	**0.9**	**305.6**	**17.3**	**0.98**	**352.3**	**23.3**	**1.16**	109.4%	115.3%
	Avg Spd	**SB**			**18.8**			**17.8**			**17.7**		94.5%	99.2%
		NB			**18.3**			**17.4**			**11.7**		95.5%	67.0%
Wsh-Wbsh	**Broadway**	**SB**	14th	260.7	11	0.42	270.2	12	0.39	257.6	7.21	0.31		
			Wabash	167.5	12.5	0.62	177.1	14.7	0.72	181	10.5	0.43		
		NB	14th	210.1	8.8	0.37	230.8	12	0.35	232	12.4	0.31		
			Wshgtn	330.3	10	0.37	344.2	15	0.34	365.3	15.3	0.2		
	totals			**968.6**	**42.3**	**1.78**	**1022.3**	**53.7**	**1.8**	**1035.9**	**45.41**	**1.25**	105.5%	101.3%
	Avg Spd	**SB**			**18.2**			**16.8**			**24.8**		91.9%	147.8%
		NB			**28.7**			**21.3**			**13.2**		74.1%	61.9%
s/o Wabash	**Broadway**	**SB**	Del Norte	51	2.1	0	60.4	2.7	0	66.4	2.7	0		
			Hawthorne	103.6	2.7	0	119.6	4	0	127.3	6.1	0.23		
			Hndrson	370.9	11.2	0.29	428.5	17.4	0.39	478.0	15.2	0.29		
			Byshore	368.6	10.5	0.09	412.4	15.2	0.17	464.3	18.6	0.35		
		NB	Hndrson	421.9	12.9	0.33	454.7	20.7	0.44	481	18.3	0.16		
			Hawthorne	522	14.3	0	566.3	20.1	0	478.9	21.7	0.4		
			Del Norte	126.9	4.6	0.09	135.9	6.9	0.23	152.5	6.6	0.06		
			Wabash	51.5	6.4	0.62	55.1	10.8	0.61	64	7.3	0.5		
	totals			**2016.4**	**64.7**	**0.38**	**2232.9**	**97.8**	**0.56**	**2312.4**	**96.5**	**1.99**	110.7%	103.6%
	Avg Spd	**SB**			**33.7**			**26.0**			**26.7**		77.0%	102.7%
		NB			**29.4**			**20.7**			**21.8**		70.5%	105.3%
				Existing a.m. peak			**Baseline a.m. Peak**			**Baseline + Project a.m. peak**			**Exist/ Baseline**	**Baseline/ Project**
				VMT	**VHT**	**Stops**	**VMT**	**VHT**	**Stops**	**VMT**	**VHT**	**Stops**	**VMT**	**VMT**
Grand Totals	**Hwy 101**	**SB**		1952.6	77.3	2.25	2162.3	96.9	2.58	2545.3	104.81	3.05	110.7%	117.7%
		NB		2290.5	84.1	2.42	2454.3	107.07	2.99	2341.3	121.9	3.22	107.2%	95.4%
		Both		4243.1	161.4	4.67	4616.6	203.97	5.57	4886.6	226.71	6.27	108.8%	105.8%
													MPH	**MPH**
	Avg Spd	**SB**			**25.3**			**22.3**			**24.3**		88%	109%
		NB			**27.2**			**22.9**			**19.2**		84%	84%
		Both			**26.3**			**22.6**			**21.6**		86%	95%

TABLE IV.O-7 (Continued)
P.M. PEAK HOUR MICRO-SIMULATION RESULTS

Section	Street	Dir	Intrsction	Existing p.m. peak VMT	Existing p.m. peak VHT	Existing p.m. peak Stops/Veh	Baseline p.m. Peak VMT	Baseline p.m. Peak VHT	Baseline p.m. Peak Stops/Veh	Mitigated Baseline + Project p.m. peak VMT	Mitigated Baseline + Project p.m. peak VHT	Mitigated Baseline + Project p.m. peak Stops/Veh	Exist/ Baseline VMT	Baseline/ Project VMT
Downtown	**4th**	**WB**	H	113.9	5.5	0.07	117.5	5.8	0.07	132.4	7.1	0.12		
			F	167.4	6.2	0.02	173	6.4	0.02	197.7	8	0.1		
			E	68.3	3	0.07	70.3	3.1	0.07	84.4	3.7	0.07		
			C	146.9	5.4	0.07	150.1	5.4	0.06	182.4	8.8	0.3		
			Broadway	195.9	8.1	0.09	200	8.2	0.07	413.6	42.2	1.38		
	5th	**EB**	C	337.7	12.5	0.08	357.9	13.4	0.08	469.2	21	0.41		
			E	148.2	7.6	0.34	156.8	8.3	0.36	201.4	9.4	0.13		
			F	87.2	3.9	0.07	92.5	4.1	0.07	117.4	5.5	0.07		
			H	146.6	6	0.09	156.6	6.4	0.09	186.2	9	0.14		
			I	87.5	3.9	0.1	94.2	4.4	0.11	112	7.3	0.23		
	totals			**1499.6**	**62.1**	**1**	**1568.9**	**65.5**	**1**	**2096.7**	**122**	**2.95**	104.6%	133.6%
	Avg Spd	**WB**	4th		**24.6**			**24.6**			**14.5**		100.2%	58.9%
		EB	5th		**23.8**			**23.4**			**20.8**		98.5%	88.8%
Balloon	**Broadway**	**SB**	5th	79.2	3.6	0	38.5	1.4	0	90.8	12.2	0.46		
			6th	42.3	3.7	0.28	43.7	4.2	0.31	76.6	18.3	0.45		
			7th	78.7	3.4	0.03	81.3	3.8	0.05	80.7	5.3	0.09		
			Wshgtn	67.9	8.8	0.3	70.5	13	0.3	93.3	5.7	0.14		
		NB	7th	50	2.3	0.01	53	2.5	0.01	61.8	4.6	0.24		
			6th	61	3.9	0.27	64.8	4.2	0.26	68.8	7.1	0.34		
			5th	18.8	1.6	0.04	20.2	1.7	0.05	21.1	2.1	0.1		
	totals			**397.9**	**27.3**	**0.93**	**372**	**30.8**	**0.98**	**493.1**	**55.3**	**1.82**	93.5%	132.6%
	Avg Spd	**SB**			**13.7**			**10.4**			**8.2**		76.0%	78.7%
		NB			**16.6**			**16.4**			**11.0**		98.7%	66.9%
Wsh-Wbsh	**Broadway**	**SB**	14th	447.9	24.6	0.52	461.6	26.3	0.51	488.6	24.7	0.37		
			Wabash	262.4	32.9	0.94	270.8	39.4	1.01	296.6	19	0.4		
		NB	14th	206.8	11.9	0.41	220.6	13.5	0.44	231.9	10.8	0.17		
			Wshgtn	357.4	15.3	0.26	385	17.2	0.3	417.5	20.3	0.46		
	totals			**1274.5**	**84.7**	**2.13**	**1338**	**96.4**	**2.26**	**1434.6**	**74.8**	**1.4**	105.0%	107.2%
	Avg Spd	**SB**			**12.4**			**11.1**			**18.0**		90.2%	161.2%
		NB			**20.7**			**19.7**			**20.9**		95.1%	105.9%
s/o Wabash	**Broadway**	**SB**	Del Norte	107	4.6	0	111.9	4.9	0	118	5.2	0.01		
			Hawthorne	213.4	6.3	0	223.2	6.6	0	226.5	11.2	0.19		
			Hndrson	731.9	27.5	0.44	769	30.8	0.5	811.0	23.2	0.37		
			Byshore	620.5	24.7	0.45	656.8	27.1	0.48	725.7	29.8	0.41		
		NB	Hndrson	378.1	15.5	0.52	417	16.9	0.53	465.1	15.3	0.24		
			Hawthorne	518.9	14.3	0	571.1	16.1	0	492.2	25.7	0.46		
			Del Norte	129.3	4.5	0.07	140.1	6.2	0.15	159.5	11.5	0.21		
			Wabash	53.6	7.6	0.54	58.7	8.6	0.5	61.1	9.5	0.42		
	totals			**2752.7**	**105**	**2.02**	**2947.8**	**117.2**	**2.16**	**3059.1**	**131.4**	**2.31**	107.1%	103.8%
	Avg Spd	**SB**			**26.5**			**25.4**			**27.1**		95.7%	106.8%
		NB			**25.8**			**24.8**			**19.0**		96.3%	76.5%

Grand Totals			Existing p.m. peak VMT	Existing p.m. peak VHT	Existing p.m. peak Stops	Baseline p.m. Peak VMT	Baseline p.m. Peak VHT	Baseline p.m. Peak Stops	Baseline + Project p.m. peak VMT	Baseline + Project p.m. peak VHT	Baseline + Project p.m. peak Stops	Exist/ Baseline VMT	Baseline/ Project VMT
	Hwy 101	**SB**	3343.6	168.3	3.3	3438.2	186.4	3.5	4018.3	224.4	4.86	102.8%	116.9%
		NB	2581.1	110.8	2.8	2788.5	123.5	3.0	3065.2	159.1	3.62	108.0%	109.9%
		Both	5924.7	279.1	6.1	6226.7	309.9	6.4	7083.5	383.5	8.48	105.1%	113.8%
												MPH	**MPH**
	Avg Spd	**SB**		**19.9**			**18.4**			**17.9**		93%	97%
		NB		**23.3**			**22.6**			**19.3**		97%	85%
		Both		**21.2**			**20.1**			**18.5**		95%	92%

travel time from current conditions over the same distance is approximately 59 seconds. In other words the project traffic would result in an additional 20 seconds of travel time in the corridor with all recommended project mitigation over 2010 Baseline Conditions without the project and without any mitigation.

During the p.m. peak hour, the project traffic along with the recommended mitigation (includes all mitigation recommended in the traffic impact study for 2010 Baseline + Project Conditions) results in slightly worse operations with the project than without in 2010. The project would result in an increase of roughly 8 percent additional traffic on Broadway in 2010 over volumes without the project. In 2010, along the project frontage on Broadway, there would be a reduction in average speeds from 13 mph to approximately 10 mph between Fourth Street and Washington in the p.m. peak hour. However, with project required mitigation, acceptable 2010 operating conditions would be maintained on Broadway, according to Caltrans' LOS criteria. With the project, average speed in both directions of U.S. 101 (Broadway, Fourth and Fifth Streets), would be reduced from 21.2 mph to 18.5 mph. Without the project in 2010, the 6 percent growth in traffic would result in a drop from 21.2 mph to 20.1 mph.

As noted previously an assumed full build-out of the project in 2010 is used for the purpose of this study to examine the maximum traffic impacts created by the proposed project. Under this scenario, travel time during the p.m. peak hour southbound on U.S. 101 (between Fourth/I Streets to Broadway/Bayshore) would increase from 7 minutes and 55 seconds today, to about 8 minutes and 48 seconds in 2010. This is an increase of 53 seconds. The project would increase travel time northbound during the same time period and on the same segment of U.S. 101 from 6 minutes and 46 seconds today, to about 8 minutes and 11 seconds, for a total increase of about 1 minute and 25 seconds. Without the project, southbound travel times on U.S. 101 would increase to 8 minutes and 34 seconds (an increase of about 40 seconds), and northbound times would increase to about 6 minutes and 57 seconds (an increase of about 11 seconds). In summary, in the p.m. peak hour in 2010, the addition of project traffic with full mitigation would result in an increase of 14 seconds of travel time for westbound-southbound traffic in the corridor with a 74-second increase for northbound-eastbound traffic.

The elimination of the major bottlenecks on Broadway at Wabash-Fairfield and at Henderson are key improvements contributing to acceptable operations being maintained, as cited above.

There are additional aspects of improvements to traffic circulation completed as part of the proposed project that warrant evaluation. Under project conditions, on Broadway between Fourth and Washington Streets, signals would be spaced at approximately 600-foot intervals, and the mitigation of Broadway at Wabash-Fairfield involves the installation of a new signal at Broadway and Hawthorne, 1,000 feet south of Wabash Avenue. The analysis of system operations includes the overall coordination and synchronization of traffic signals along U.S. 101 in Eureka between I Street and the Bayshore Mall (including the above-cited signals that would be installed as part of the proposed project or as project mitigation). As mentioned above, the micro-simulation model closely estimates existing traffic performance in terms of average speeds through a series of signals, the number of stops in each direction through these same signals, and other performance measures.

Detailed results from the micro-simulation model are in Table IV.O-7, which illustrates the effects of both Baseline 2010 and Baseline 2010 plus Project traffic (mitigated) compared to existing conditions. Full project access to Broadway is generally accommodated within acceptable level of service criteria established by Caltrans for U.S. 101 both in terms of intersection LOS as well as urban arterial LOS. With urban arterial LOS, the criterion is speed. With 30 mph speed limits, the minimum acceptable average speed on Broadway is 9 mph or faster using this criterion. Table IV.O-7 shows that all segments of Broadway would operate at speeds greater than 9 mph except southbound Broadway between Fourth and Washington Streets in the p.m. peak hour. Overall, U.S. 101 through all study intersections would have an average speed of 21.6 mph in the a.m. peak hour and 18.5 mph in the p.m. peak hour, compared with 22.6 mph (a.m. peak) and 20.1 mph (p.m. peak) on Broadway without the project in 2010.

Implementation of the Mitigation Measures O-1a through O-1k, as discussed later, would reduce the project's impact to roadway circulation and operation to a less-than-significant level as shown in Table IV.O-8 excepting the unsignalized intersection of Wabash and Koster during the p.m. peak hour. The lane configuration at the study intersections with the mitigation measures are illustrated in Figure IV.O-10. Detailed illustrations of improvements in 2010 are shown in Figures IV.O-11 and IV.O-12 for north and south Broadway, respectively.

Generally, the mitigation measures are directed towards increasing capacity. Once all recommended mitigation is in place, all but one of the study intersections operate acceptably, so there is a less-than-significant impact from project traffic excepting one intersection.

The intersection at Koster and Wabash would reach LOS E between 2010 and 2025 with or without the project. Under 2010 conditions, with the addition of project trips, the Koster/Wabash intersection is expected to operate at LOS E during the p.m. peak hour, and the project trips are anticipated to result in more than 5 seconds of additional delay (thus triggering the significance threshold). There is no feasible mitigation for the intersection at Koster and Wabash because the intersection is too close to the complex intersection of Broadway and Wabash-Fairfield for signalization, and the traffic volumes on Wabash are high enough to result in LOS E for southbound left turns from Koster to eastbound Wabash. The major difficulty in placing a traffic signal is that westbound traffic would easily back up on Wabash through Broadway thus blocking through-north and southbound traffic on Broadway, and eliminating the benefits from the major mitigation at this intersection (e.g., diverting northbound Fairfield traffic to Broadway via a new signalized intersection at Broadway and Hawthorne). If the Wabash/Koster intersection were signalized and timed to avoid such backups, the necessary yellow plus all-red signal clearance interval would need to be prolonged (to avoid stopping vehicles on Wabash between Broadway and Koster), and would also result in LOS E operations at Wabash and Broadway even with the mitigation proposed for that intersection. Some southbound Koster traffic could be rerouted to other streets such as 14th Street. It is likely that the traffic patterns would naturally reroute without any need to regulate southbound traffic on Koster at Wabash during the p.m. peak hour. However, even with likely rerouting, the intersection at Koster and Wabash intersection would still operate unacceptably with the project's added vehicle trips. Consequently, mitigation for this intersection is infeasible, and this impact would remain significant and unavoidable.

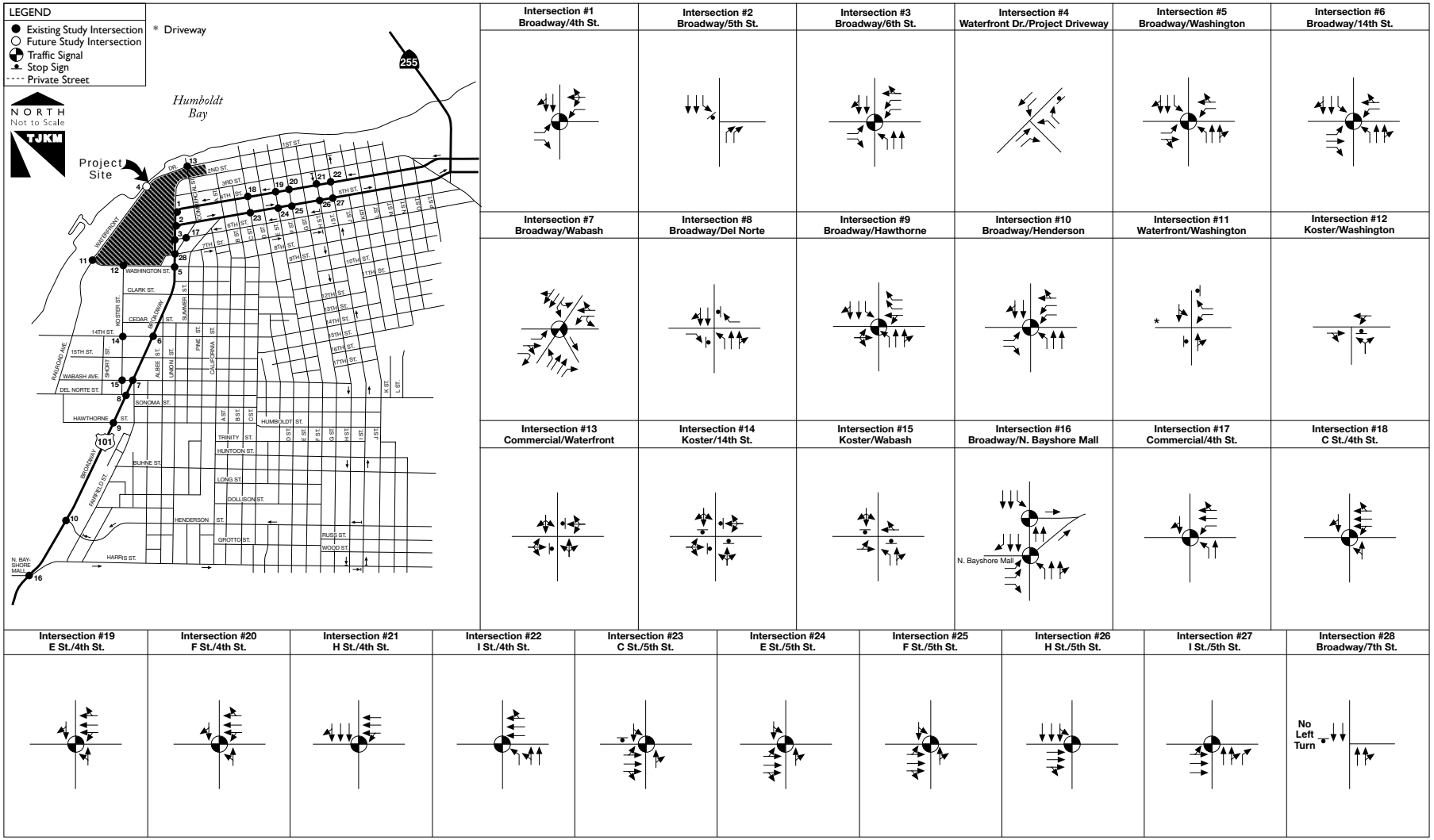
TABLE IV.O-8
LEVELS OF SERVICE SUMMARY – BASELINE 2010 PLUS PROJECT WITH MITIGATION

ID		2010 Baseline (With Project)			
		A.M. Peak Hour		P.M. Peak Hour	
		Delay	LOS	Delay	LOS
Signalized Intersection					
1	Broadway and Fourth Street	6.0	A	16.1	B
3	Broadway and Sixth Street	15.6	B	38.4	D
5	Broadway and Washington Street	5.5	A	12.6	B
6	Broadway and 14th Street	10.9	B	18.7	B
7	Broadway and Wabash Avenue/Fairfield Street	22.0	C	25.8	C
10	Broadway and Henderson Street	13.5	B	16.0	B
16	Broadway and Harris Street/Bayshore	3.9	A	22.4	C
19	Fourth Street and E Street	5.1	A	8.4	A
20	Fourth Street and F Street	2.7	A	9.6	A
21	Fourth Street and H Street	4.5	A	12.7	B
22	Fourth Street and I Street	9.5	A	11.9	B
24	Fifth Street and E Street	9.1	B	16.9	B
25	Fifth Street and F Street	4.9	A	9.9	A
26	Fifth Street and H Street	9.4	A	10.6	B
27	Fifth Street and I Street	22.4	C	25.4	C
Unsignalized Intersection					
2	Broadway and Fifth Street	11.7	B	22.1	C
4	Waterfront Drive/Fourth Street (Project)	11.6	B	17.3	C
8	Broadway and Del Norte Street	13.2	B	16.4	C
9	Broadway and Hawthorne Street	9.4	A	7.8	A
11	Washington Street and Waterfront Drive	11.7	B	17.7	C
12	Washington Street and Koster Street	10.7	B	11.6	B
13	Waterfront Drive and Commercial Street	9.1	A	9.6	B
14	Koster Street and 14th Street	10.0	A	20.6	C
15	Wabash Avenue and Koster Street	15.6	C	**45.3**	**E**
17	Commercial Street and Fourth Street	5.3	A	15.2	B
18	Fourth Street and C Street	3.8	A	5.5	A
23	Fifth Street and C Street	4.6	A	10.6	B

NOTES: Delay = Control Delay in Seconds per Vehicle, LOS = Level of Service
X.X = Average Intersection Delay in seconds per vehicle (for signalized intersections) OR
Average Delay in seconds per vehicle for the worst minor approach (for unsignalized intersections)

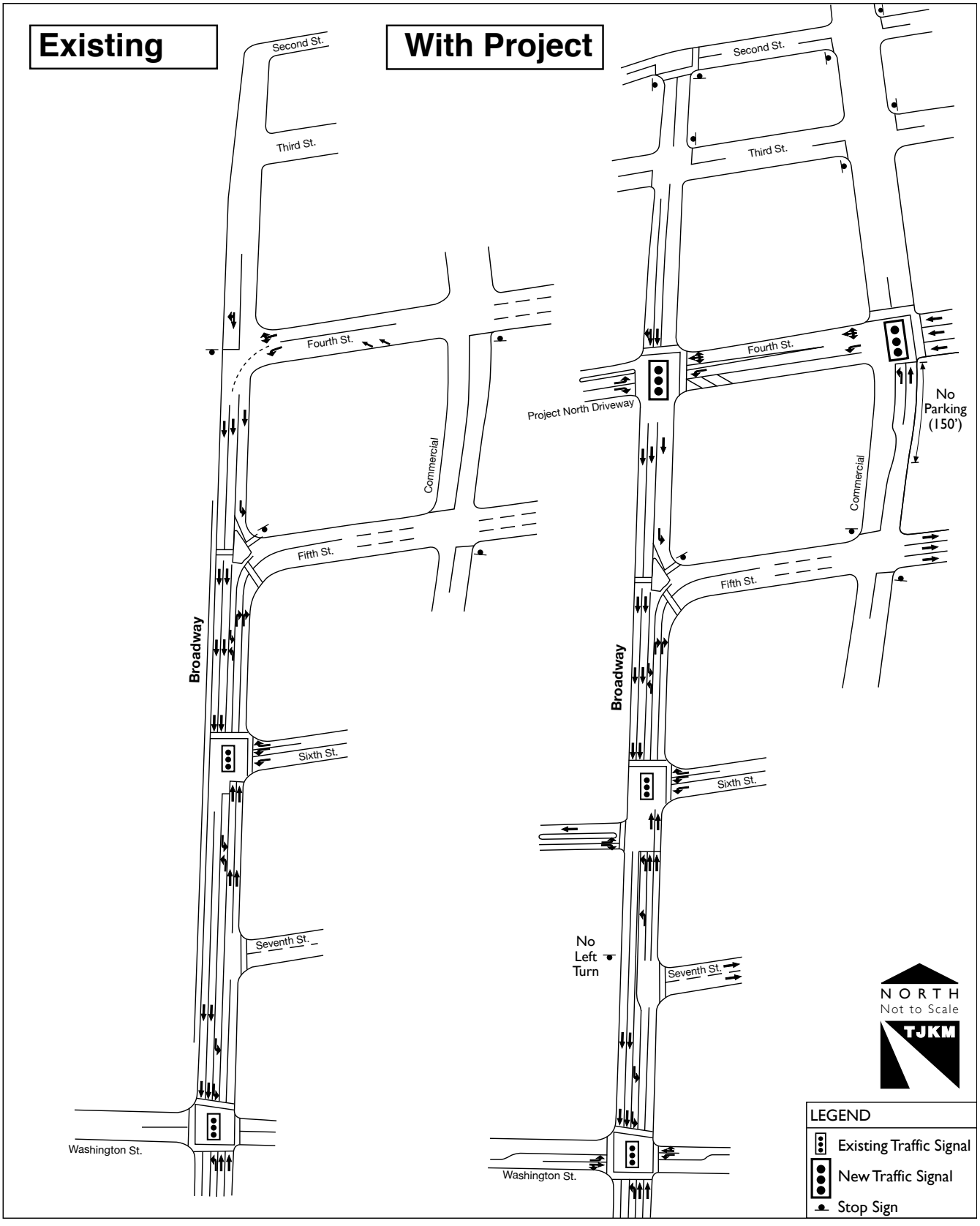
SOURCE: TJKM Transportation Consultants (2007)

The recommended mitigation measures for the project in 2010 are consistent with the measures specified in the Eureka Redevelopment Plan, and include new traffic signals as well as improved timing on all traffic signals along U.S. 101 through Eureka. The project site plan will be designed to safely and efficiently accommodate STAA-sized trucks (the maximum size truck allowed in California) and will meet the standards of American Association of State Highway and Transportation Officials [AASHTO] and design requirements of the City of Eureka. The project will also develop adequate bike parking spaces onsite consistent with current city policies.



SOURCE: TJKM Transportation Consultants

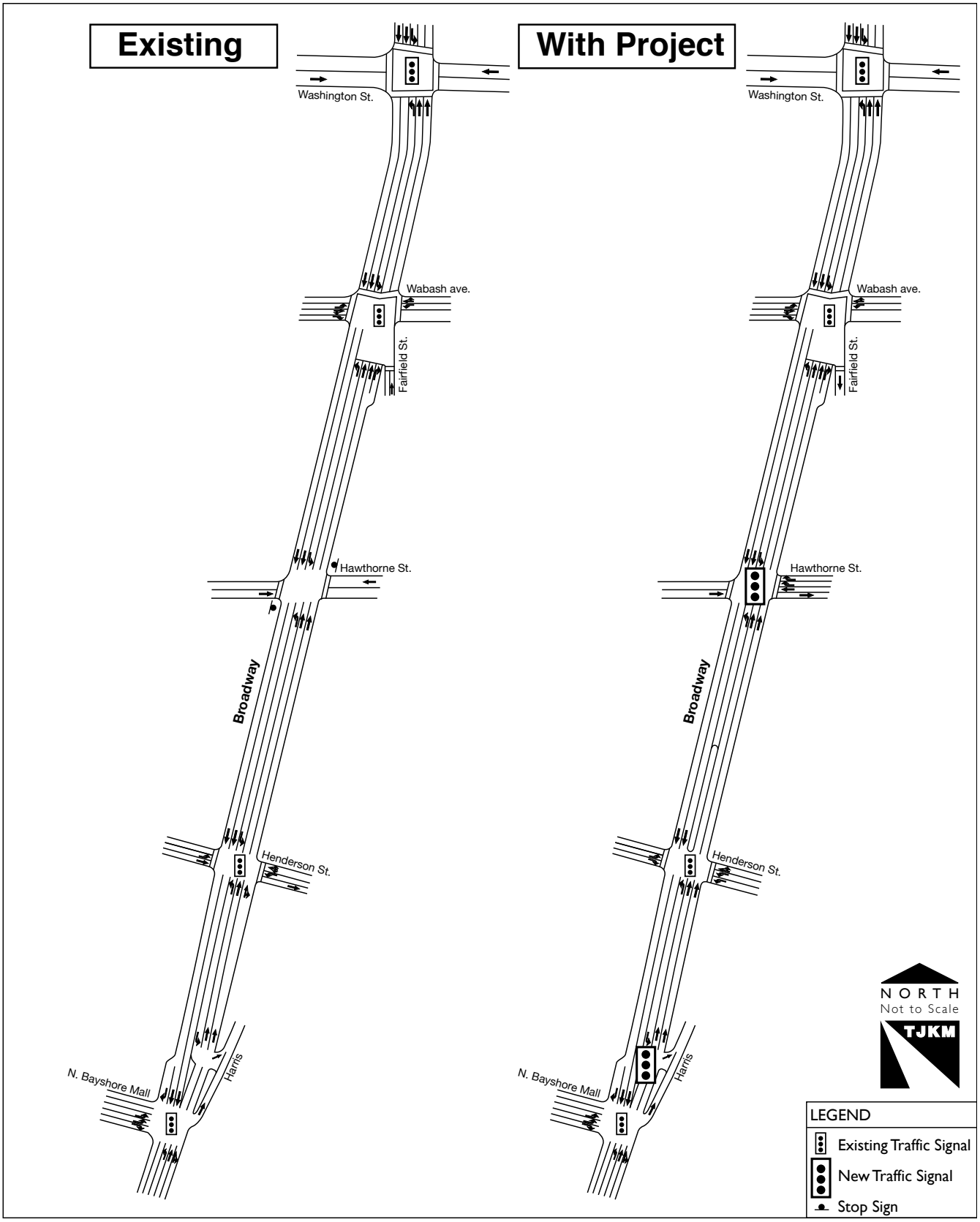
Figure IV.O-10
Baseline 2010 + Project Land Configurations and Traffic Controls with Mitigation



Marina Center Mixed-Use Development Project . 205513

SOURCE: TJKM Transportation Consultants

Figure IV.O-11
Broadway 2010 Improvements (North)



Marina Center Mixed-Use Development Project . 205513

SOURCE: TJKM Transportation Consultants

Figure IV.O-12
Broadway 2010 Improvements (South)

The mitigation measures identified in this EIR were developed in consultation with Caltrans District 1, which controls the right-of-way and certain facilities along U.S. 101. Caltrans District 1 has generally concurred in the list of improvements needed along the U.S. 101 corridor for this project. Caltrans must still approve any final construction plans and specifications through an encroachment permit. The design standards used by Caltrans are widely known and contained within Caltrans design manuals. Consequently, Caltrans is anticipated to formally approve the intersection and other improvements as they become necessary through project phasing.

Mitigation

Mitigation Measure O-1a: The project applicant and construction contractor(s) shall develop a construction management plan for review and approval by the City's Engineering Department and Caltrans. The plan shall include at least the following items and requirements to reduce traffic congestion during construction:

1. A set of comprehensive traffic control measures shall be developed, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes. Prior to approving plans for mitigation on U.S. 101, Caltrans requires that all construction activities include an assessment of the potential for traffic congestion. This is accomplished through lane closure analysis showing the times of day and days of the week that lanes can be closed to traffic. Excepting extraordinary circumstances, lane closures are authorized at times of the day and on days of the week where the interruptions, closures, and activity is least likely to cause unacceptable congestion using the same level of service criteria as used for assessing project traffic impacts.

2. If construction activities result in unacceptable traffic congestion, flaggers shall supplement approved traffic control plans to ensure that traffic moves through the construction zone with minimal delays.

3. The Construction Management Plan shall identify haul routes for movement of construction vehicles that would minimize impacts on motor vehicle, bicycle, and pedestrian traffic, circulation, and safety, and specifically to minimize impacts to the greatest extent possible on streets in the project area. The haul routes shall be approved by the City and Caltrans

4. The Construction Management Plan shall provide for notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures would occur.

5. The Construction Management Plan shall provide for accommodation of bicycle flow, particularly along First Street and Waterfront Drive.

6. The Construction Management Plan shall provide for monitoring surface streets used for haul routes so that any damage and debris attributable to the haul trucks can be identified and corrected by the project applicant.

Mitigation Measure O-1b: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following modifications at the intersection of Broadway and Wabash Avenue/Fairfield Street:

1. Close northbound Fairfield Street access to Wabash Avenue and Broadway approximately 40 feet south of the intersection, and post signs on northbound Fairfield at Del Norte advising motorists that traffic is "LOCAL ACCESS ONLY – NO ACCESS TO BROADWAY OR WABASH AVENUE". Closure should be accomplished by extending the east curb of Fairfield to the street centerline, and posting a "DO NOT ENTER" sign at the closure.

2. Modify the Broadway and Wabash signal to account for the elimination of northbound Fairfield access.

Mitigation Measure O-1c: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following modifications at the intersection of Broadway and Hawthorne Street:

1. Install a new signal and intersection improvements (see #3 below) at Broadway and Hawthorne Street.

2. Install a southbound left turn and westbound right turn overlap signal phase (no southbound U-turns allowed).

3. Widen Hawthorne Street to provide two westbound right turn lanes and one westbound through/left lane. The cross-section for Hawthorne Street shall be 58 feet wide (including 6-foot sidewalk) from 175 east of Broadway to Broadway. Transition to the widened section should start at Fairfield Street, and the six-foot sidewalk should also extend from Broadway to Fairfield Street. An advisory sign must be posted to northbound motorists on Fairfield Street south of Hawthorne Street saying "NO ACCESS TO WABASH AVENUE OR BROADWAY AHEAD – USE HAWTHORNE STREET TO BROADWAY" with a left arrow.

Mitigation Measure O-1d: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following improvements at Broadway and Henderson Street:

1. Convert Henderson Street to one-way westbound traffic from Fairfield Street to Broadway and provide for one westbound through/right lane and two westbound left turn lanes to southbound Broadway from Henderson Street. Remove southbound left turns to eastbound Henderson Street by closing the southbound left turn lane and modifying the signal indications. Retain the all-way stop at Fairfield and Henderson Streets.

2. Convert the Henderson Street and Broadway signal to allow simultaneous eastbound left turns with westbound left turns.

3. Post a "NO LEFT TURN" sign for southbound Broadway and a "NO RIGHT TURN" sign for northbound Broadway at Henderson Street and post "ONE-WAY" signs on Henderson Street.

Mitigation Measure O-1e: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following signal-coordination improvements along the U.S. 101 corridor:

1. Install signal interconnect on U.S. 101 so that all signals along the corridor are in one system, from V Street at Fourth and Fifth Streets to the K-Mart signal and Broadway signal near Bayshore Mall. This would be accomplished by installing conduit and cable from Broadway and Henderson to Broadway and Wabash, Fourth Street at Broadway from Broadway and Sixth to E Street, and Fifth Street at Broadway from Broadway and Sixth to E Street.

2. Develop and implement optimized signal coordination timing on U.S. 101 from Fourth and Fifth Streets at Myrtle to Broadway, and on Broadway from Fourth Street to the K-Mart driveway signal near Bayshore Mall. A monitoring system would be set up to the satisfaction of Caltrans District 1 and City of Eureka traffic signal operations personnel.

Mitigation Measure O-1f: The project applicant shall post guide signs within the Marina Center parking lot directing motorists to southbound U.S. 101 via Waterfront Drive, or to the east and north in downtown and along U.S. 101, via project access drives on Second and Third Streets.

Mitigation Measure O-1g: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following modifications at Broadway and Harris Streets:

1. Provide appropriate guide signs to advise southbound Broadway motorists to turn left at Harris Street to go east up the hill on Harris Street.

2. Install a signal at Harris Street and Broadway to provide protected southbound left turns from Broadway to eastbound Harris Street. This signal shall interconnect the north Bayshore Mall driveway signal and coordinate at all times except evenings and early morning hours to be determined by timing plans to coordinate signals along U.S. 101.

3. Lengthen the southbound left-turn lane to 300 feet in length. This does not affect the existing northbound left turn striping into Victoria Place (private drive).

4. Provide funds for private signage to the Bayview Motel at Fairfield Street and Henderson Street for both northbound and southbound motorists.

5. Shift the two southbound through lanes and southbound left turn lane at least 6 feet to the west for an appropriate distance to provide for adequate left turning radius for STAA trucks making a southbound left turn to eastbound Harris Street.

Mitigation Measure O-1h: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed improvements necessary to prohibit southbound left turns from Broadway to eastbound Seventh Street, and instead, shift these turns to the southbound left turn lane at Washington Street. Guide signs shall be posted, that return motorists to eastbound Seventh Street by turning left onto Summer Street, than east at Seventh Street.

Mitigation Measure O-1i: The project applicant shall obtain an encroachment permit from the City of Eureka and shall cause to be installed an all-way stop at Fairfield and Hawthorne Street.

Mitigation Measure O-1j: The project applicant shall obtain an encroachment permit from the City of Eureka and shall cause to be installed a southbound left-turn lane and northbound right-turn lane on Waterfront Drive at the project access driveway.

Mitigation Measure O-1k: The project applicant shall obtain an encroachment permit from Caltrans and shall cause to be completed the following improvements at Broadway and Washington Street:

1. Install east and westbound left turn lanes on Washington Street.

2. Modify the traffic signals at Broadway at Washington Street and Broadway at 14th Street to operate with protected-permissive phasing for the left turn movements on Broadway.

Finding of Significance

With the exception of one intersection (Koster/Wabash Avenue), the recommended mitigation measures would reduce the potential impacts of the Marina Center project's increase in traffic to ***less-than-significant*** levels**.** However, even with mitigation, the potential impacts of the Marina Center project on the unsignalized intersection at Koster/Wabash would remain ***significant and unavoidable***.

Impact O-2: Would the Marina Center project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Humboldt County has not established a county congestion management agency. Therefore, there are no levels of service standards established by such an agency. The potential impacts of the Marina Center project to exceed level of service standards established by the City of Eureka and Caltrans are discussed under Impact O-1 and Impact O-8

Mitigation

None recommended.

Finding of Significance

The potential for the Marina Center project to exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency would be ***less-than-significant***.

Impact O-3: Would the Marina Center project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The Marina Center project would have no impact on air traffic patterns; the nearest airport is the Eureka Municipal Airport which just over 2 miles away on the Samoa Peninsula.

Mitigation

None recommended.

Finding of Significance

The Marina Center project would have ***no impact*** 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.

Impact O-4: Would the Marina Center project substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Collision data from the Statewide Integrated Traffic Records System (SWITRS) was obtained from the California Highway Patrol for the period January 2000 to September 2005. The summary of collision analysis at study intersections in the City of Eureka is on-file and available for review at the City of Eureka Community Development Department.

Project traffic would add to the traffic patterns at intersections where accident rates are above what would be expected (i.e., higher than the statewide average for similar intersections). This additional traffic would also be subject to higher than average accident rates at these locations. While the higher traffic volumes generated by the proposed project would increase the potential for safety conflicts, it is not expected that project traffic would increase the accident rate itself (i.e., the number of accidents per number of vehicles traveling on the roads or through the intersections), because the proposed project would not introduce unsafe design features or a mix of vehicle types [trucks versus cars] incompatible with the existing vehicle mix. The proposed project would change the character of roadways in the project site vicinity by installing traffic signals at currently unsignalized intersections. In addition, as described under Impact O-1, above, after implementation of identified mitigation measures which include upgrading current traffic signals to modern standards as well as signal coordination, all but one of the study intersections would operate at acceptable levels of service and would be expected to reduce accidents by about 15 percent (per Caltrans methodology, page IV.O-18) due to the improved traffic controls and operations. Therefore, the proposed project would have a less-than-significant impact on traffic safety.

Mitigation

See Mitigation Measures O-1a through O-1k.

Finding of Significance

The recommended mitigation measures would avoid or reduce the potential for the Marina Center project to substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) to a ***less-than-significant*** level.

Impact O-5: Would the Marina Center project result in inadequate emergency access?

The project would create new roadways between Broadway and Waterfront Drive through an area that is currently inaccessible to emergency equipment. The access drives and internal circulation would be designed to accommodate STAA trucks, which is more than required for fire equipment maneuverability. Also, pedestrian, bicycle and vehicular traffic are all to be accommodated upon the new roads on the project site. The combination of new and more direct routes between Broadway and Waterfront Drive coupled with good internal circulation would enable effective emergency service to the project site as well as provide more direct routes to Waterfront Drive. The project would result in increases in traffic along Broadway/U.S. 101 – the main arterial for movement of emergency vehicles within the City. With the transportation improvements already identified, however, average speeds along U.S. 101 are expected to be 21.6 mph in the a.m. peak and 18.5 mph in the p.m. peak, which is more than adequate to accommodate emergency vehicle access needs. (As stated above, an acceptable level of service for urban arterial roadways is a minimum of 9 mph.) Therefore, the proposed project would have a less-than-significant impact on emergency access.

Mitigation

None recommended.

Finding of Significance

The potential for the Marina Center project to result in inadequate emergency access would be ***less-than-significant***.

Impact O-6: Would the Marina Center project result in inadequate parking capacity?

When a project proposes more than one use on a site, the City of Eureka requires the number of parking spaces provided to equal the sum of the requirements for each individual use. The *City of Eureka Municipal Code* Section 155.117 requires 1,580 spaces for the planned uses. The conceptual plan provides 1,585 parking spaces, which includes a four-level parking structure, as well as on-street angle parking along the north side of Second Street between Broadway and A Street. The angle parking on Second Street would use an indented curb so that on-street parking on the south side of Second Street would not be affected. A shared parking analysis (i.e., how different land uses "share" a given parking space at different times of the day) for the land uses is on-file and available for review at the City of Eureka Community Development

Department. That analysis found that the maximum demand for parking would be less than the provided spaces, excepting in the month of December when the total parking demand would at times exceed available parking by as many as 94 spaces.

Mitigation

Mitigation Measure O-6a: The project applicant shall develop a parking management plan that provides a mechanism that would direct employees to park off-site (in available on-street parking spaces in the area) during periods of peak parking demand in December.

Finding of Significance

The potential for the Marina Center project to result in inadequate parking capacity would be ***less-than-significant***, since the time when capacity would be exceeded would be limited to only 1 month of the year.

Impact O-7: Would the Marina Center project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Train Access

The Union Pacific owns the rail corridor that transverses the site and leases the right-of-way to the Northwestern Pacific Railroad (NWPR) who operates the line for the North Coast Railroad Authority (NCRA). With the proposed project, the railroad right-of-way would remain intact (approximately a 50- to 60-foot right-of-way).

With the exception of sporadic service provided through 2001 on the southern end of the railroad between Penngrove and Schellville, there has not been substantial freight activity along the corridor since 1997, which was the last year the entire 300-mile line was in operation. Track closures from slope failures in the Eel River canyon and other problems on the line to the south have prevented rail service from returning to the region. However, operations for the NWPR are projected to be reinstated, as the NCRA has received Federal Emergency Funding for repairs to the rail corridor (NCRA, 2006).

In addition, there are planning efforts to restore passenger rail service to the Humboldt Bay region. Efforts are underway by the Northern Counties Logging Interpretive Association to bring a tourist train to Humboldt Bay. The route would use the existing tracks around the bay from Eureka to Arcata and Samoa.

The operation of a freight or passenger line along the western property boundary would cause safety and access concerns under project development. The railroad right-of-way would be maintained with the project, however, proper railroad crossings pavement markings and signs should be provided. With the implementation of Mitigation Measures O-7a, O-7b and O-7c (related to managing the railroad right-of-way), safety concerns regarding railroad operations would be less-than-significant.

Transit Access

The closest transit stop to the project site is located at Koster and Washington Streets, along the southbound leg of the Red Route; however, this transit stop has recently been decommissioned. The transit stop still has a shelter present, which has not been maintained, and is still listed on the transit schedule. The closest northbound stop is located on the Red Route at Seventh and California Streets, four blocks from the project site.

Development of the proposed project would increase the demand for transit to the site, as land uses would generate both jobs and retail destinations. With the implementation of Mitigation Measure O-7d (bus stop reinstatement and/or improvements), transit access would be within a reasonable walking distance from the project site and sidewalks would be provided along all routes. Alternatively, and if desired by the Humboldt Transit Authority and/or the Redwood Transit System, a transit stop could be provided on site. Under either alternative, however, reasonable transit access would be maintained.

Bicycle Access

The proposed project could generate bicycle traffic, and would provide both short-term and long-term parking for bicycles. Secure racks would be located near building entrances. Bicyclists would be attracted to the proposed project for employment, shopping, dining, and entertainment. Adequate, safe, and secure bike parking should be provided according to *2004 Regional Bicycle Transportation Plan Update* (Humboldt County). To be secure, bicycle parking facilities would be in front of the store and visible to customers entering and exiting stores, to minimize the potential for theft and vandalism. Bike parking for employees would be provided as an incentive for employees to ride bikes to work. Bike lockers or a fenced in, covered enclosure with bike racks within, can be locate behind businesses or in the parking structure. With the implementation of Mitigation Measure O-7e (bicycle parking spaces), sufficient bicycle parking would be provided on-site.

The project proposes to develop a section of the Waterfront Drive multi-use path, which the City has proposed for installation north of Del Norte Street along Railroad Street and Waterfront Drive. The planned path would extend east along Waterfront Drive to meet up with the soon-to-be-constructed trail along the Old Town Boardwalk east of C Street. The Waterfront Drive pedestrian and bicycle path through the project limits would be beneficial to the community and provide connectivity for further development of the path beyond the project site boundary. The path would be designed to meet the requirements of Chapter 1000 of the Caltrans *Highway Design Manual* (2004).

Pedestrian Access

The location of the project site allows for good pedestrian access and circulation. Sidewalks exist along most of the local roadways in the project vicinity. Based on the conceptual site plan, the Second Street vehicle access and the Fourth Street vehicle access would provide good ingress and egress towards downtown with landscaped pedestrian paths that create a pedestrian-friendly environment. The Second Street access also provides a landscaped pedestrian access to the

waterfront. The signalized access at Sixth Street provides good access to the site with landscaped pedestrian access.

The project is required to construct sidewalks to City of Eureka standards along the project frontage on Broadway, Waterfront Drive, Washington Street and Second Street. In addition, internal sidewalks would connect the project site with the public sidewalks along the frontage of the project site. Traffic signals installed as part of the proposed project would include pedestrian facilities such as pedestrian signal-heads, push buttons, curb-cut ramps at the intersections, and painted crosswalks.

The orientation of the parking stalls would be such that pedestrians can walk along the parking rows instead of having to cross the parking rows. The orientation of parking as shown on the conceptual site plan follows this design guideline. Adequate sidewalks with wheelchair ramps would be provided for pedestrian access. The conceptual plan shows fairly defined landscaped pedestrian paths from store to store across the parking lot creating an attractive pedestrian appearance.

The proposed project would be required to comply with the measures identified in the Redevelopment Plan PEIR, and noted above, related to the provision of bicycle parking spaces, and such compliance would reduce effects to less-than-significant.

Mitigation

Mitigation O-7a: The project applicant shall work with the North Coast Railroad Authority to maintain adequate right-of-way along the rail corridor in anticipation of future rail service through the site.

Mitigation O-7b: The project applicant shall work with the North Coast Railroad Authority and, if the Authority anticipates future use of the railroad right-of-way, the applicant shall pay to install pavement markings and warning signs at the project driveway on Waterfront Drive where the railroad tracks cross the driveway throat. Pavement markings and warning signs shall conform to standards set forth in the *Manual on Uniform Transportation Devices* (FHWA, 2004). The driveway shall include crossing gates and a median. Because the project site is in a quiet zone, the median would prevent drivers from going around the crossing arm onto the tracks, and thus the trains are not required to blow their horns when crossing the roadway. The crossing arms would also prevent pedestrians and bicyclists from venturing onto the tracks when a train is coming.

Mitigation O-7c: The project applicant shall provide smooth pavement transition over the railroad tracks so that bikes and wheelchair users are not in danger of losing their balance or getting wheels stuck between the rails and the pavement. The crossing of the tracks shall be perpendicular.

Mitigation O-7d: The project applicant shall work with the Eureka Transit Authority to reinstate the bus stop at Koster and Washington Streets and improve the bus stop at Seventh and California Streets, including paying their fair-share to enhance amenities of the stop (i.e., shelter, bench, and signage).

Mitigation O-7e: The project applicant shall provide eight bicycle parking spaces per 10,000 gross square feet of retail space and placement shall be in accordance with guidelines set forth in Appendix B of the *2004 Regional Bicycle Transportation Plan Update* (Humboldt County).

Finding of Significance

The recommended mitigation measures would avoid and minimize the potential for the Marina Center project to conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks) to a ***less-than-significant*** level.

Cumulative Impacts

Cumulative Conditions at Study Intersections (Year 2025)

To forecast traffic volumes for Cumulative plus Project Conditions in 2025, the historical trends of traffic volume growth on Broadway at Wabash were analyzed from 1985 through 2005 based upon published Caltrans traffic volume data.[3] Additional analysis and details regarding estimation of future volumes are on-file and available for review at the City of Eureka Community Development Department.

Historical traffic count data from 1994 to 2004 on Broadway were also consulted, which identified little growth. Although year to year the growth is uneven, the annual average growth is 1.5 percent per year. Compounded over the 19 years for this analysis (2006 to 2025), a 33 percent increase in traffic would be expected by 2025.

Also taken into account were substantial other project development anticipated by 2025. Cumulative conditions were estimated by adding trips from other known development projects to the study intersections. Known projects were defined as currently identified projects in various stages of the entitlement process. Anticipated Potential Development Projects are presented in Figure IV.O-13, and their estimated trip generation is shown in Table IV.O-9. Project number 12, the 26,000 square-foot Co-Op Grocery Store, is now in operation, but was under construction at the time the 2006 Existing Conditions counts were made.[4] When both potential project trips and Marina Center trips are added to existing volumes, the increased traffic is just over 33 percent greater than existing 2006 volumes. In cases where the addition of project traffic and Potential Development Project traffic resulted in a greater than 33 percent increase, that value was used instead, so the minimum increase in traffic at study intersections for 2025 is 33 percent.

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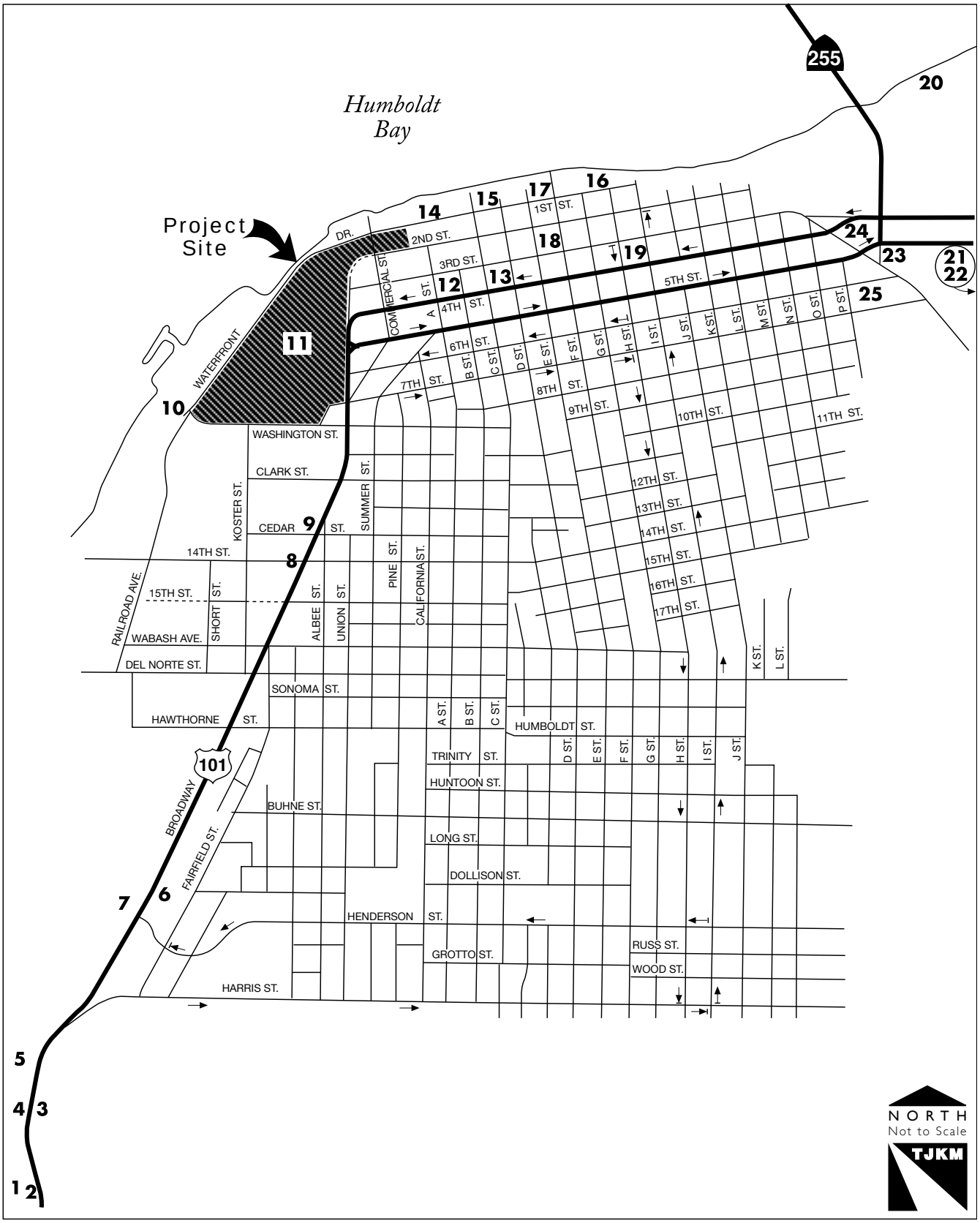
3 Although the Humboldt County countywide travel model was made available for use in estimating project traffic distribution and assignment to study intersections, future land uses have not been finalized to reflect the most likely growth and development in the Arcata-Eureka-Fortuna area.

4 Additional information pertaining to the development of the cumulative traffic volumes is on-file and available for review at the City of Eureka Community Development Department.



SOURCE: TJKM Transportation Consultants

Marina Center Mixed-Use Development Project . 205513

Figure IV.O-13
Anticipated Potential Development Projects

TABLE IV.O-9
POTENTIAL DEVELOPMENT PROJECT TRIP GENERATION

No.	Name of Development – Land Use	ITE Code	Size		Daily		A.M. Peak Hour				P.M. Peak Hour			
					Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
1	Figas Development – Light Industrial	110	30	KSF	6.97	209	0.92	24	3	28	0.98	4	26	29
2a	Southgate Industrial Park – Warehouse	150	60	KSF	4.96	298	0.45	22	5	27	0.47	7	21	28
2b	Southgate Industrial Park – Office	710	32.5	KSF	14.35	466	2.15	62	8	70	2.23	10	62	72
3a	Ocean View Commercial Development - Retail/Services	820	18.2	KSF	57.95	1,055	1.31	15	9	24	5.37	47	51	98
3b	Ocean View Commercial Development - Office	710	9.8	KSF	14.35	141	2.15	19	2	21	2.23	3	19	22
4	Peterson Tractor - New Automobile Sale	841	47.9	KSF	33.34	1,597	2.05	73	26	98	2.64	49	77	126
5a	Bayshore Inn – Motel	320	51	Rooms	5.63	287	0.45	8	14	23	0.47	13	11	24
5b	Bayshore Inn – Restaurant	931	6.4	KSF	89.95	576	0.81	4	1	5	7.49	32	16	48
6	Fredrickson Lease - Retail/Services	820	6	KSF	57.95	348	1.31	5	3	8	5.37	15	17	32
7a	Eureka Pacific - Retail/Services	820	26	KSF	57.95	1,507	1.31	21	13	34	5.37	67	73	140
7b	Eureka Pacific – Restaurant	931	14	KSF	89.95	1,259	0.81	9	2	11	7.49	70	35	105
8	Eureka Health Foods – Supermarket	850	18	KSF	102.24	1,840	3.25	36	23	59	10.45	96	92	188
9	Redwood Marine Boats – New Automobile Sale	841	33.5	KSF	33.34	1,117	2.05	51	18	69	2.64	34	54	88
10	Hampton Inn – Motel	320	100	Rooms	5.63	563	0.45	17	28	45	0.47	25	22	47
11	Balloon Track Mixed-Development - Mixed Land Use	Proposed Project												
12	Co-Op Grocery Store – Supermarket	850	26	KSF	102.24	2,658	3.25	52	33	85	10.45	139	133	272
13	NCVRC – Office	710	9.1	KSF	14.35	131	2.15	17	2	20	2.23	3	17	20
14a	FB's Fish Processing Plant – Light Industrial	110	12	KSF	6.97	84	0.92	10	1	11	0.98	1	10	12
14b	Fisherman's Building Café – High Turnover Restaurant	932	3	KSF	127.15	381	11.52	18	17	35	10.86	20	13	33
15a	Seaport Village – Retail	820	22.5	KSF	57.95	1,304	1.31	18	11	29	5.37	58	63	121
15b	Seaport Village – Office	710	5.6	KSF	14.35	80	2.15	11	1	12	2.23	2	11	12
15c	Seaport Village - Residential Condo / Townhouse	230	9.4	KSF	5.86	55	0.44	1	3	4	0.52	3	2	5
16a	Bayfront One – Retail	820	24	KSF	57.95	1,391	1.31	19	12	31	5.37	62	67	129
16b	Bayfront One – Office	710	4	KSF	14.35	57	2.15	8	1	9	2.23	1	8	9
16c	Bayfront One - Residential Condo./Townhouse	230	12	DU	5.86	70	0.44	1	4	5	0.52	4	2	6

TABLE IV.O-9 (Continued)
POTENTIAL DEVELOPMENT PROJECT TRIP GENERATION

No.	Name of Development – Land Use	ITE Code	Size		Daily		A.M. Peak Hour				P.M. Peak Hour			
					Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
17a	Bayfront Two – Retail	820	24	KSF	57.95	1,391	1.31	19	12	31	5.37	62	67	129
17b	Bayfront Two – Office	710	4	KSF	14.35	57	2.15	8	1	9	2.23	1	8	9
17c	Bayfront Two - Residential Condo./Townhouse	230	12	DU	5.86	70	0.44	1	4	5	0.52	4	2	6
18	Coastal Business Systems – Office	710	3	KSF	14.35	43	2.15	6	1	6	2.23	1	6	7
21	Shoreline RV Park - RV Park	416	100	OCS	-	-	0.2	8	12	20	0.37	26	11	37
22	Hidden View - Residential Condo./Townhouse	230	38	DU	5.86	223	0.44	3	14	17	0.52	13	7	20
23	HCOE School - Elementary School	520	75	Students	1.29	97	0.42	17	14	32	0.28	9	12	21
25	Seventh Street Villa's - Residential Condo./Townhouse	230	6	DU	5.86	35	0.44	0	2	3	0.52	2	1	3
Total						**10,699**		**582**	**303**	**884**		**885**	**1013**	**1,898**

Notes and Assumptions:

DU – Dwelling Unit; KSF = 1,000 Square feet; OCS – Occupied Camp Sites

Assumptions:

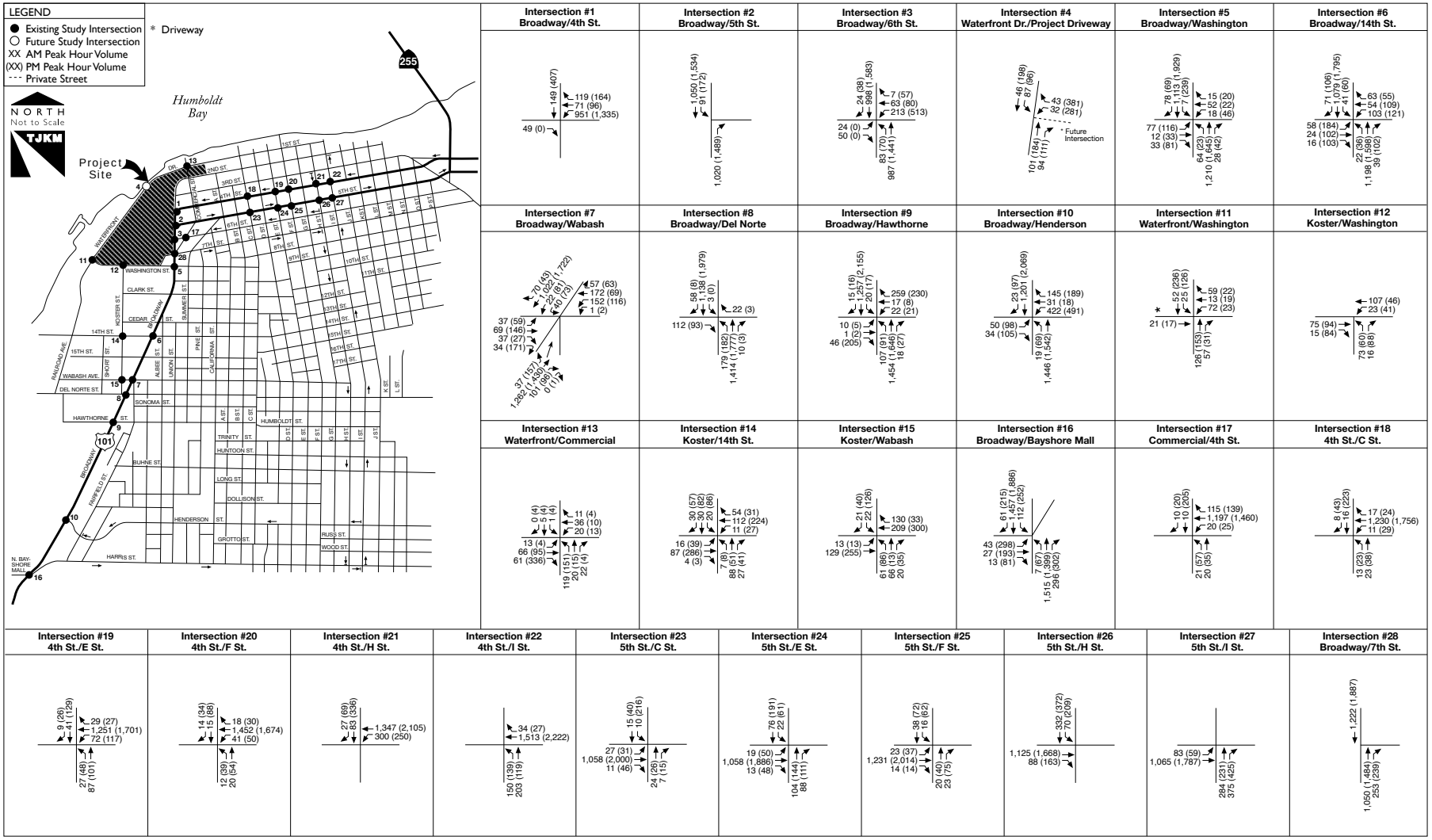
2a – 65% warehouse, 35% office
3b – FAR of 0.4 acres, 65% retail/service and 35% office
4 – new car sales (841 ITE Code) for tractor sales
7a – 65% retail/service and 35% office
8 – net increase of 18 ksf expansion of new facility
9 – 0.35 FAR per acre for a 2.2 acre lot expansion
10 – 100 rooms
13 – office land use
14a – light industrial
15a – 60% retail, 15% office, 25% residential
16a – 60% retail, 15% office, 25% residential
17a – assumption same as 15a, 16a
21 – An increase of 100 OCS expansion

The analysis of future traffic also examined the correlation between the growth in population and the growth in traffic from 1985 through 2000. The correlation is statistically significant, and the forecast increase in population of the Arcata-Eureka-Fortuna developed area also supports the analytical assumption that traffic on Broadway will increase by approximately 33 percent by 2025.

Impact O-8: Would the Marina Center project contribute to adverse cumulative increases in traffic at local intersections in the project area in 2025?

Results of Level of Service Analysis

Trips from the proposed project were added to the forecasted 2025 peak-hour turning movement volumes. Figure IV.O-14 illustrates 2025 peak-hour turning movement volumes at the study intersections during both the a.m. and p.m. peak hours with the proposed project. The same lane



SOURCE: TJKM Transportation Consultants

Figure IV.O-14
Cumulative 2025 + Project Turning Movement Volumes

configurations and traffic controls for 2010 Plus Project Conditions (with 2010 Mitigation) are assumed through 2025. This is based on the logic that in order to implement the project completely by 2010, mitigation must be in place to accommodate the additional traffic and also serve project access with new signalized intersections. Table IV.O-10 summarizes the results of the intersection analysis for 2025 plus project conditions. The detailed LOS calculations are on-file and available for review at the City of Eureka Community Development Department.

TABLE IV.O-10
LEVELS OF SERVICE SUMMARY –
2025 CUMULATIVE (PLUS PROJECT) WITHOUT AND WITH FUTURE MITIGATION

		2025 Cumulative (Without Future Mitigation)				2025 Cumulative (With Future Mitigation)			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID		Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
Signalized Intersection									
1	Broadway and Fourth Street	9.1	A	32.7	C	9.1	A	32.7	C
3	Broadway and Sixth Street	18.4	B	23.8	C	18.4	B	23.8	C
5	Broadway and Washington	6.7	A	29.7	C	6.7	A	29.7	C
6	Broadway and 14th Street	8.3	A	**78.6**	**E**	8.3	A	29.9	C
7	Broadway and Wabash/ Fairfield	24.5	C	**73.3**	**E**	24.5	C	28.2	C
9	Broadway and Hawthorne*	10.4	B	17.4	B	10.4	B	17.4	B
10	Broadway and Henderson	13.6	B	**59.1**	**E**	11.5	B	19.0	C
16	Broadway and Harris/ Bayshore	3.8	A	**69.2**	**E**	5.6	A	17.4	B
17	Commercial and Fourth Sts*	8.6	A	14.8	B	8.6	A	14.8	B
18	Fourth Street and C Street	4.2	A	12.7	B	4.2	A	12.7	B
19	Fourth Street and E Street	5.8	A	8.7	A	5.8	A	8.7	A
20	Fourth Street and F Street	2.2	A	8.0	A	2.2	A	8.0	A
21	Fourth Street and H Street	3.8	A	11.9	B	3.8	A	11.9	B
22	Fourth Street and I Street	10.9	B	10.1	B	10.9	B	10.1	B
23	Fifth Street and C Street	3.8	A	19.3	C	3.8	A	19.3	C
24	Fifth Street and E Street	9.2	A	12.5	B	9.2	A	12.5	B
25	Fifth Street and F Street	3.8	A	8.5	A	3.8	A	8.5	A
26	Fifth Street and H Street	9.4	A	15.1	B	9.4	A	15.1	B
27	Fifth Street and I Street	21.7	C	22.6	C	21.7	C	22.6	C
Unsignalized Intersection									
2	Broadway and Fifth Street	12.1	B	19.2	C	12.1	B	19.2	C
4	Waterfront Drive/Fourth St. (Project)	10.3	B	10.7	B	10.3	B	16.9	C
8	Broadway and Del Norte	14.8	B	18.3	C	14.8	B	15.5	C
11	Washington and Waterfront	12.7	B	11.0	B	12.7	B	17.2	C
12	Washington and Koster	10.1	B	10.6	B	10.1	B	10.1	B
13	Waterfront and Commercial	8.8	A	11.3	B	8.8	A	11.5	B
14	Koster and 14th Street	9.0	A	15.7	C	9.0	A	15.0	C
15	Wabash and Koster	15.0	C	30.4	D	15.0	C	**43.0**	**E**

NOTES: Delay = Control Delay in Seconds per Vehicle, LOS = Level of Service
X.X = Average Intersection Delay in seconds per vehicle (for signalized intersections) OR
Average Delay in seconds per vehicle for the worst minor approach (for unsignalized intersections)

SOURCE: TJKM Transportation Consultants (2007)

Under 2025 Cumulative plus Project Conditions, four signalized study intersections would operate at an unacceptable level of service during the p.m. peak hour. The intersections at Broadway / 14th Street, Broadway / Wabash-Fairfield Streets, Broadway / Henderson Street, and Broadway / Bayshore Mall driveway would all operate at LOS E during the p.m. peak hour. This is a significant cumulative impact.

Mitigation

Mitigation Measure O-8a: An encroachment permit shall be obtained from Caltrans and the project applicant shall install the following improvements:

The outbound (egress) from the project site to Broadway shall be closed off at both the Fourth and Sixth Street exits, and signs shall be installed on the project site to divert the outbound traffic to Waterfront Drive, then south to Hawthorne Street at Broadway, or to Second and Third Streets at Broadway; and

This mitigation measure shall be completed before the intersections exceed the acceptable LOS, which in this case is estimated to occur when southbound through volumes on Broadway at 14th Street average at least 1,700 vehicles per hour during the p.m. peak hour.

Mitigation Measure O-8b: An encroachment permit shall be obtained from Caltrans and the project applicant shall pay its fair share contribution for the installation of the following improvements:

1. Three southbound lanes shall be striped on Broadway from Vigo Street to the northern Bayshore Mall driveway at Harris Street;

2. The existing southbound right-turn lane into the northern driveway of Bayshore Mall just south of Harris Street shall be converted from an exclusive right-turn lane to a shared-through-right turn lane; and

3. The improvements above shall be completed before the intersections and roadway segments exceed the acceptable LOS, which in this instance shall occur when southbound through volumes on Broadway at 14th Street average at least 1,700 vehicles per hour during the p.m. peak hour.

Finding of Significance

Under 2025 Cumulative plus Project Conditions and with implementation of the Mitigation Measures O-8a and O-8b, the cumulative impacts of the proposed project would be reduced. However, the project applicant is only required to pay its fair share, and there is no program in place or funding otherwise identified to ensure completion of the mitigation measures within the time period necessary to avoid the impacts. In addition, the project would result in an unacceptable LOS at the intersection of Koster Street and Wabash Avenue even under mitigated conditions and therefore, the project's cumulative impact would remain ***significant and unavoidable***.

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