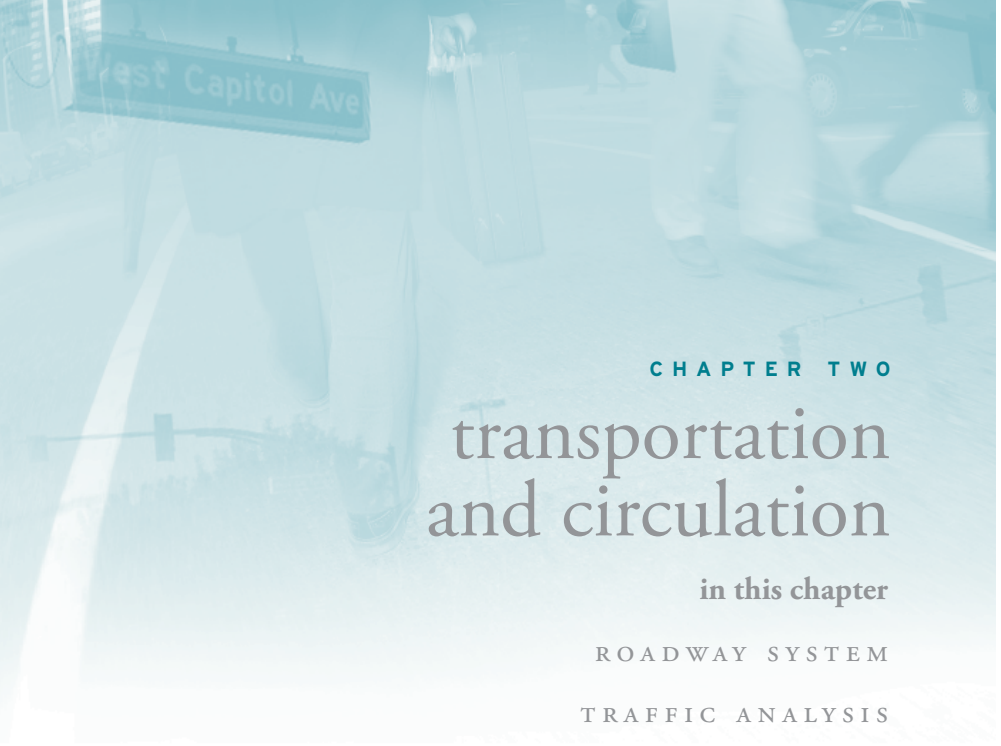
chapter 2

TRANSPORTATION & CIRCULATION

palm avenue

Designers need to work together with engineers to understand the multiple uses for streets and to place an emphasis on residents rather than vehicles, while acknowledging traffic patterns and street engineering.

Michael Southworth and Eran Ben Joseph.
Streets and the Shaping of Towns and Cities (Island Press, 2003), 140



CHAPTER TWO

transportation and circulation

in this chapter

THE STREETSCAPE AND DESIGN GUIDELINES ARE INTRINSICALLY linked to transportation and circulation needs for the different users of Palm Avenue, including pedestrians, bicyclists, transit, cars, trucks and emergency access vehicles. In order to create a comprehensive and effective urban design plan, it is essential to provide effective transportation systems without compromising the unique character of the corridor.

To play this role and meet the Plan's objectives, this chapter evaluates the existing roadway network and recommends improvements for all modes of travel including automobile, bus, parking, pedestrian, bicycle , etc. Please refer to Chapter 1 Design Guidelines of this volume for a more detailed description of recommended streetscape improvements in the area. (For a more detailed analysis of the issues identified in this chapter, refer to KOA's Imperial Beach SR-75 Corridor Traffic Impact Analysis, dated February, 2009.)

ROADWAY SYSTEM

Palm Avenue/SR-75 is a 6-lane highway through the majority of Imperial Beach from 13th Street to 7th Street. West of 7th Street the highway transitions to 4-lanes. Average daily traffic (ADT) volumes range from 18,800 to 38,000 vehicles per day, gradually decreasing from east to west along Palm Avenue/SR-75. Various improvements are proposed to provide traffic calming measures, aesthetic enhancements and improved pedestrian connections along Palm Avenue /SR-75 between 13th Street and Rainbow Avenue. To accomplish this, modifications are proposed to existing vehicular travel lanes, parking areas, medians, landscaping, sidewalks, crosswalks, curbs, and gutters.

The roadway traffic study analyzed the existing and proposed improvements for the current year as well as the "horizon year" that anticipated increased traffic in the future. All existing signalized intersections along Palm Avenue/SR-75 were studied to determine their level of operation in the current year. The results are reported in levels of service (LOS) and form the basis for comparisons of the effects of the proposed project.

As mentioned in Urban Design Concept chapter in Volumen I, improvements recommended for each of the four sectors is based on the distinct road geometries, traffic demands, and street character along Palm Avenue within each sector. Overall street network, local and regional traffic flows and their impacts were also taken into account.

The improvements to support the proposed public and potential future private realm development along Palm Avenue have been described under each sector. For more detailed information, refer to the Appendix 2

EAST END GATEWAY

The East End Gateway sector is the first impression of Imperial Beach for those entering the city from the west. along SR-75. This sector receives the highest amount of traffic along the corridor and requires the most capacity. Because of this, no changes in the number of lanes were proposed. However, the generous width of the existing pavement allows for landscaped bulb-outs, bicycle lanes, and parking while maintaining standard Caltrans lane widths. The addition of bulb-outs to the corners of the signalized intersections will reduce crosswalk lengths and the time needed for pedestrians to cross the roadway. This reduction in pedestrian crossing time can have positive effects on the operation of the traffic signals. The addition of bulb-outs and bicycle lanes along the corridor does not directly affect the analysis of traffic operations, but should provide traffic calming effects and safer travel for bicyclists, vehicles, and pedestrians alike.

FIGURE 2.1 13TH STREET AND FLORENCE STREET INTERSECTIONS

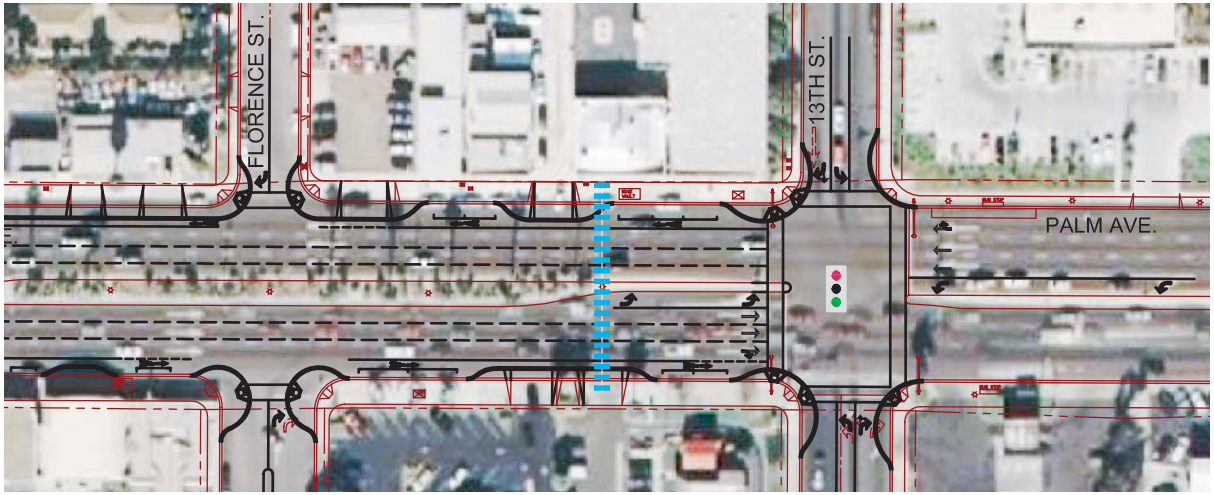


FIGURE 2.2 FLORIDA STREET AND 12TH STREET INTERSECTIONS

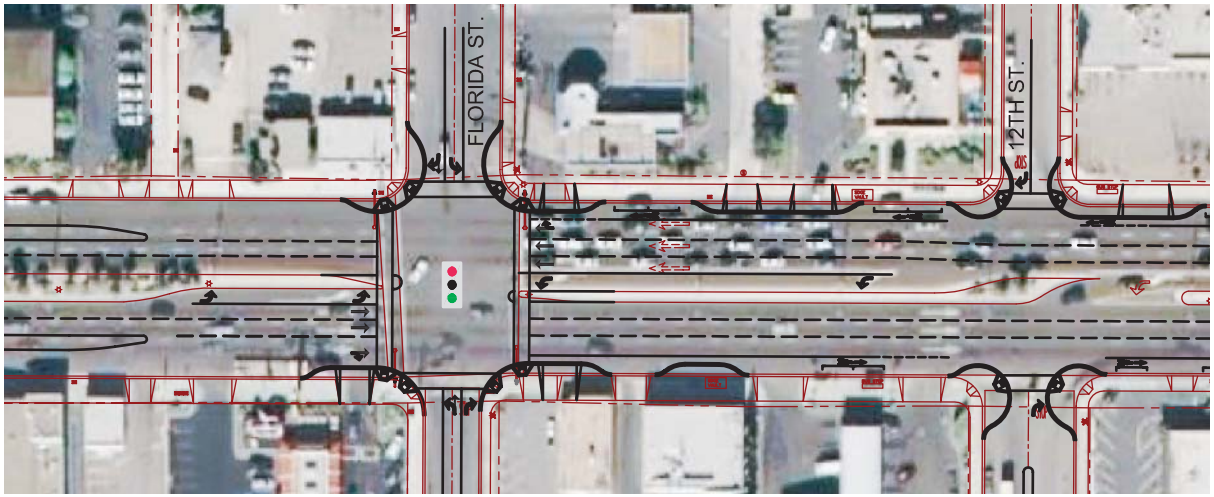


FIGURE 2.3 10TH STREET INTERSECTION

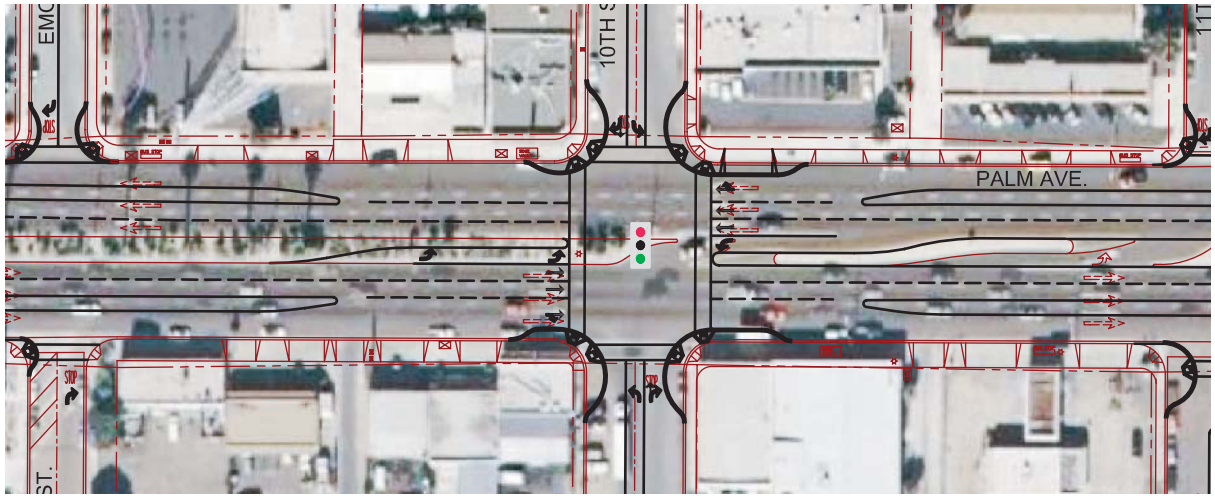
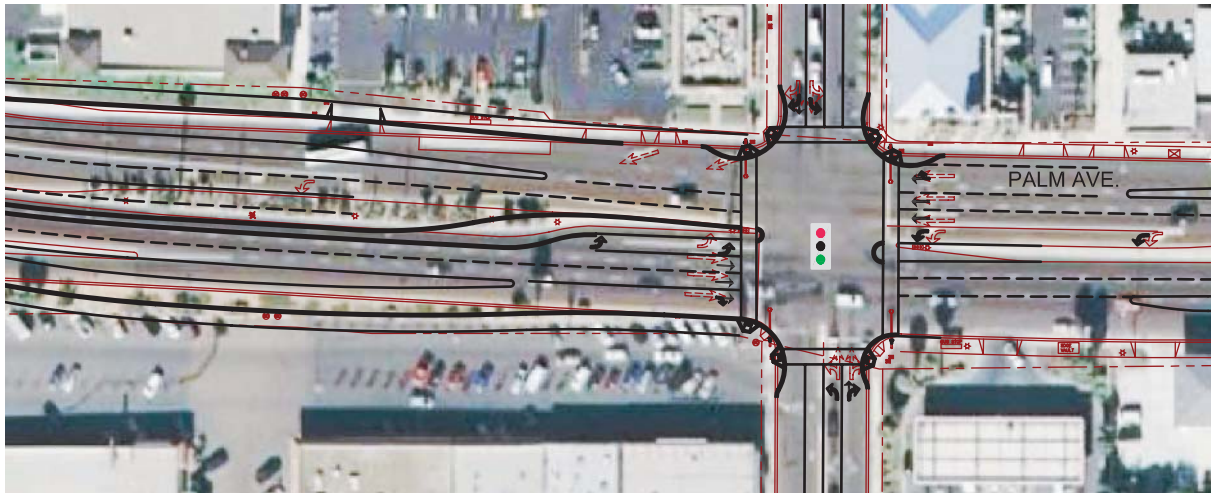


FIGURE 2.10 9TH STREET INTERSECTION



MID-TOWN SECTOR

In the Mid-Town Sector, roadway improvements reflect the need to reduce the speed and enhance the safety of vehicles and bicyclists traveling in the local access lanes and accessing the adjacent commercial establishments. The project proposes the addition of two auxiliary medians to separate the local traffic lanes from the inner two through lanes that run in either direction. This segregation of the local access lanes would change the functionality of these lanes, making them more similar to service lanes for the side streets and the commercial establishments adjoining the street. The proposed design would reclassify this segment of Palm Avenue from a six lane major arterial to a "modified" six lane major arterial with reduced capacity. The project also proposes the addition of a new full traffic signal at 10th Street by removing the existing medians while simultaneously closing the existing dual left hand turns at 11th Street. This would change the traffic patterns of nearby streets, as some of the traffic at nearby intersections may be diverted onto the 10th Street and SR-75/Palm Avenue intersection. Bulb-outs at the intersections will again lessen the length of travel time pedestrian need to cross Palm Avenue/ SR-75.

PARK SECTOR

The most prominent portion of the project lies in the heart of the corridor in what is referred to as the Park Sector. This area is a bound by SR-75, Palm Avenue, 7th Street and Delaware Street that form three signalized intersections in close proximity to one another, with a triangular park in the middle. The proposed configuration seeks to improve pedestrian-bicycle connections across SR-75 and should make the westbound transition from SR-75 to Palm Avenue more instinctive while maintaining acceptable levels of service for SR-75.

Due to the complexity of the existing roadway alignments multiple options were studied to find the best fit for the goals set forth by the City of Imperial Beach, Caltrans, and the design team. Three alternatives were studied in detail and a preferred alternative was chosen by the City Council to integrate into the recommended project plan.

FIGURE 2.8 7TH AND DELAWARE STREET INTERSECTIONS

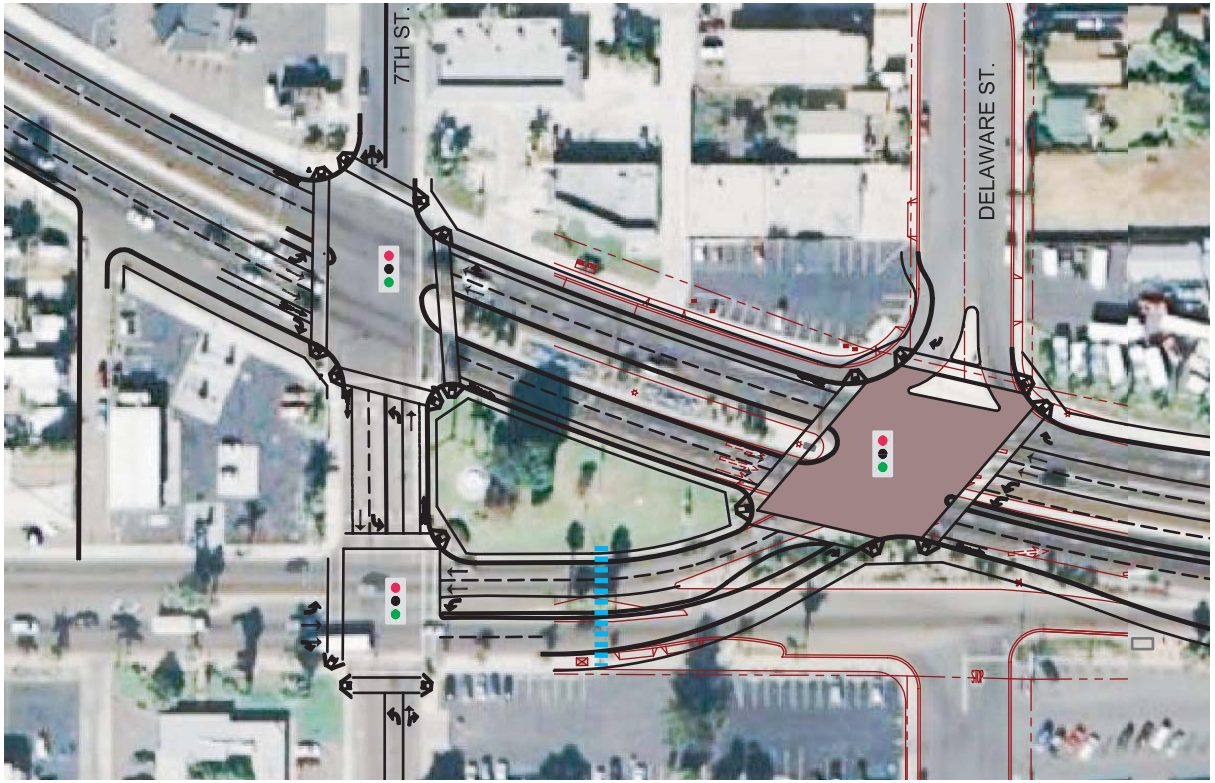
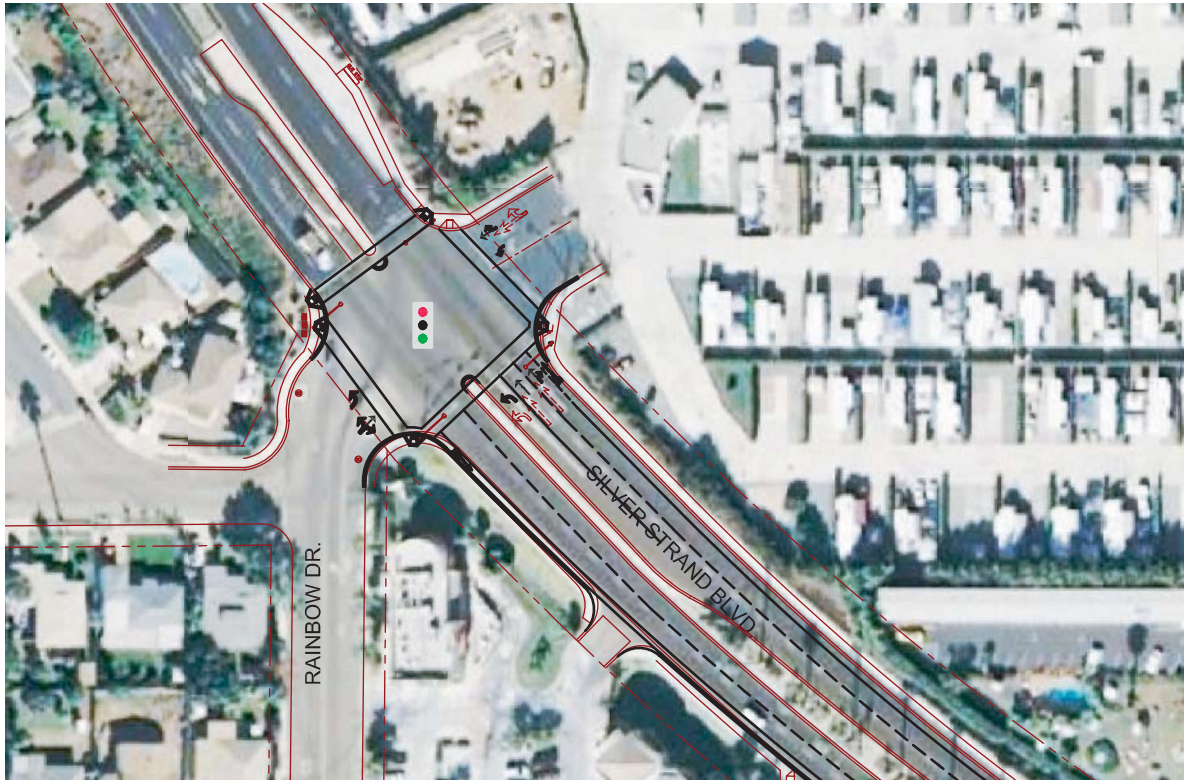


FIGURE 2.10 RAINBOW DRIVE INTERSECTION



WEST END SECTOR

The far west end of the project corridor already exists as a 4-lane roadway. Although a bicycle lane/shoulder exists along the eastbound travel lanes, infrequently used parking on the westbound side of the street is removed to provide bicycle lanes along both sides of the street. Crosswalks were added to both the Rainbow Drive and 7th Street intersections for better pedestrian connections. The striping at the Rainbow Drive signal was also changed to improve operations at the intersection due to high northbound left-turning traffic volumes that exist independently of the proposed improvements.

TRAFFIC ANALYSIS

The traffic analysis studied all of the existing and proposed signalized intersections along Palm Avenue/SR-75 to determine operations both with and without the project in both the current and future years. Results are reported in levels of service and any potentially significant environmental impacts due to traffic coming from these results have been noted. Any results worse than LOS D are considered unacceptable.

In the study years 2008 and 2030 (Horizon Year) it can be seen that all the intersections along the study corridor of Palm Avenue/ SR-75 operate at an acceptable LOS after the implementation of the proposed project.

Horizon year conditions represent traffic conditions in 2030. For this analysis a growth rate of 16.0% was calculated using the SANDAG Series 11 traffic forecast model that reflects new developments or redevelopments along the beach on the west side of Palm Avenue and along SR-75/Palm Avenue. Additionally, specific project traffic from 'cumulative ' planned new projects such as the training expansion program of the Naval Radio Receiver Facility and the Naval Amphibious Base, which is located north of Palm Avenue, was added to develop horizon year base volumes.

TABLE 1 TRAFFIC LEVEL OF SERVICE (LOS) ANALYSIS

Intersection	2008					Horizon Year				
	Without Project		With Project			Without Project		With Project		
	Delay	LOS	Delay	LOS	Sig?	Delay	LOS	Delay	LOS	Sig?
AM Peak Hour										
1. Palm Ave. and 13th St.	31.5	C	24.3	C	No	31.3	C	24.3	C	No
2. Palm Ave. and Florida St.	8.7	A	9.3	A	No	9.7	A	9.3	A	No
3. Palm Ave. and 10th St.	NA	NA	8.8	A	No	NA	NA	8.8	A	No
4. Palm Ave. and 9th St.	33.7	C	26.2	C	No	33.8	C	26.2	C	No
5. SR-75 and Delaware St.	26.7	C	7.3	A	No	29.5	C	7.3	A	No
6. Palm Ave. and Delaware St.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7. SR-75 and 7th St.	16.3	B	14.8	B	No	23.1	C	14.8	B	No
8. Palm Ave. and 7th St.	50.3	D	18.6	B	No	49.4	D	18.6	B	No
9. SR-75 and Rainbow Dr.	31.0	C	18.3	B	No	43.5	D	18.3	B	No
PM Peak Hour										
1. Palm Ave. and 13th St.	55.6	E	38.4	D	No	67.8	E	48.0	D	No
2. Palm Ave. and Florida St.	15.9	B	10.7	A	No	14.0	B	12.7	B	No
3. Palm Ave. and 10th St.[1]	0.0	A	21.5	A	No	NA	NA	8.5	A	No
4. Palm Ave. and 9th St.	45.6	D	32.2	D	No	46.7	D	44.2	D	No
5. SR-75 and Delaware St.	27.3	C	7.0	A	No	29.8	C	11.3	B	No
6. Palm Ave. and Delaware St.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7. SR-75 and 7th St.	16.0	B	12.7	B	No	20.5	C	17.1	B	No
8. Palm Ave. and 7th St.	55.5	E	16.3	B	No	55.5	E	22.4	C	No
9. SR-75 and Rainbow Dr.	26.8	C	22.6	C	No	46.5	D	29.8	C	No

TRANSIT SYSTEM

The regional transit agency, MTS, has bus service in the City of Imperial Beach with several stops along SR-75. Bus stops along Palm Avenue and SR-75 are located at:

- East of 9th Street and Palm Avenue / SR-75 (Eastbound)
- West of 11th Street and Palm Avenue / SR-75 (Eastbound)
- West of 12th Street and Palm Avenue / SR-75 (Eastbound)
- East of 13th Street and Palm Avenue / SR-75 (Eastbound)
- West of Rainbow Drive and Silver Strand Boulevard / SR-75 (Westbound)
- East of 7th Street and Silver Strand Boulevard / SR-75 (Westbound)
- West of 9th Street and Palm Avenue / SR-75 (Westbound)
- East of Emory Street and Palm Avenue / SR-75 (Westbound)
- West of 11th Street and Palm Avenue / SR-75 (Westbound)
- East of 12th Street and Palm Avenue / SR-75 (Westbound)
- East of 13th Street and Palm Avenue / SR-75 (Westbound)

The project should not affect the operation of the buses significantly. Where there are auxiliary medians that are proposed to separate traffic, the location of the bus stops should allow buses to choose the local access lanes or the through lanes. The proposed project design would also require some of the mid-block bus stops to be relocated to the closest traffic signal to facilitate accessibility of the passengers. This would discourage passengers from illegally crossing the street at mid-block locations.

BICYCLE & PEDESTRIAN SYSTEM

The Imperial Beach Bicycle Transportation Plan (BTP) is a part of the City's General Plan and is designed to illustrate the existing bicycle routes and facilities as well as lay out future bicycle transportation elements. The BTP covers the entire city's street and bicycle path network, classifying each as Class I, II and III type bicycle routes. The project is consistent with the designations set forth within this document.

The project proposes bicycle lanes on both direction between 13th Street and Florida Street. In the Mid-Town Sector between Florida Street and Delaware Street where the multi-way boulevard with auxiliary medians are proposed, bicycle traffic would have the option of using the local access lanes in lieu of Class II striped bicycle lanes. The bicycle lanes would continue again from Delaware Street to Rainbow Drive. v v lanes would also be added on 7th Street between SR-75 and Palm Avenue as an extension of the EcoRoute.

The proposed pedestrian improvements includes bulb-outs on most intersections within the project limits to reduce the walking distance and the time that pedestrians are within the roadway. The design would also improve the ability of the pedestrians, bicyclists and motorists to see each other and would encourage the motorists to travel at a slower speed, thereby improving the safety of the pedestrians. The proposed design reduces the pedestrian travel distance approximately 10 feet to 20 feet across SR-75 and involves installation of pedestrian ramps for ADA compliance. The reduction of this distance, would shorten the length of the signal's programmed pedestrian phase and as a result would improve intersection operations.

New crosswalks have been proposed for each traffic signal along the corridor to promote the movements of pedestrians across SR-75. Also, a proposed new signal at 10th Street and an upgraded traffic signal at Delaware Street would provide new, controlled pedestrian crossing points that will enhance safety and again discourage dangerous mid-block crossings along Palm Avenue/ SR-75. In addition, the bus stops are proposed to be relocated to make the crosswalks at the intersections more accessible to the pedestrians.

CONSTRUCTION PHASING

The project is envisioned to be implemented in segments as funding resources become available. For this reason, the construction phasing was assumed by project sub-area; East End Gateway, Mid-Town Sector, Park Sector, and West End Gateway. Each segment is assumed to be constructed independent of one another. However, due to the realignment needed for the Park Sector, construction for that phase would be extended to include improvements from 7th Street to 9th Street. Certain portions of the corridor may have priority for construction or have less regulatory processing required by Caltrans, leading to the need for flexibility in their construction phasing. The segment limits are then described as:

- East End Gateway: SR-75 from Florida Street to the eastern City limit
- Mid-Town Sector: SR-75 from 9th Street to Florida Street
- Park Sector: SR-75 from 7th Street to 9th Street and the roadways encompassing the park
- West End Gateway: SR-75 from western City limit to 7th Street

The roadway is currently within Caltrans jurisdiction, and is a State Route. Caltrans approval will be necessary during the design phase of these segments. During this phase, Caltrans may require different levels of processing in order to obtain approval of these projects. Some segments will need design exceptions for lane or shoulder width variations, while others may be greatly disparate to the Caltrans standard cross-sections and may require the complete relinquishment of the highway in order to implement. The level of each will be negotiated by the City of Imperial Beach and Caltrans at the time of design processing.

COST ESTIMATES

Cost estimates were based on quantities measured electronically in the AutoCAD concepts created for the project. Quantities were separated by each phased segment based upon the limits of each sector described above. Unit prices were based on recent, local costs for each pay item. Lump sum items, such as mobilization, traffic control, and clearing and grubbing, used standard percentages of construction costs. Because the project is in the preliminary concept stage, a 30% contingency was applied to the project costs, along with an additional 12% for design and 3% for environmental documentation.

The cost estimates for the park sector include one block from Delaware to 9th Street. Mid-Town runs from 9th Street to Florida Street.

TABLE 2 PRELIMINARY COST ESTIMATES

Item	West End Gateway	Park Sector	Mid-Town Sector	East End Gateway	TOTAL
Road Improvements	$1,158,000	$4,107,900	$2,524,000	$2,415,100	$10,205,000
Landscaping and Accessories	$355,000	$809,000	$693,000	$366,000	$2,223,000
Project Construction Sub-Total	*$1,513,000*	*$4,916,900*	*$3,217,000*	*$2,781,100*	*$12,428,000*
30% Contingency	$454,000	$1,475,000	$965,000	$834,000	$3,728,000
Design & Construction Admin.	$236,000	$767,000	$502,000	$434,000	$1,939,000
Environmental Documentation	$59,000	$192,000	$125,500	$108,500	$485,000
PROJECT TOTAL	*$2,262,000*	*$7,350,900*	*$4,809,500*	*$4,157,600*	*$18,580,000*