

# CHAPTER 2

## PROJECT ALTERNATIVES

### 2.1 ALTERNATIVE DEVELOPMENT PROCESS

#### *Alternatives Selected For Detailed Study*

Of six original alternatives proposed for the project, two were eliminated prior to the environmental study phase and four alternatives were chosen for further consideration. These four alternatives represent a reasonable range of project alternatives found to be most compatible with the project objectives. Preparation and consideration of geotechnical, traffic, hydraulic, and preliminary environmental studies for all original alternatives were considered. The final group of alternatives was selected subsequent to meetings between the Department Utilities Engineering unit, Right of Way Utilities and Engineering units, and the Imperial Irrigation District (IID).

The four alternatives that have been chosen for further consideration are depicted in figure 1.2-1, *Project Alternatives and Study Area*. Existing and predicted LOS and ADT levels for all proposed alternatives are shown in appendix A, exhibits 4-7. Alternative 1 is the No-Build Alternative and is included in order to compare the current and future benefits of no action with the benefits of reconstructing the interchange. Of the design alternatives considered for construction, Alternatives 2, 4 and 5 were determined to most feasibly incorporate the desired improvements and upgrades to the I-8/Imperial Avenue interchange. Alternatives 2, 4 and 5 would incorporate a type L-2 diamond configuration for the westbound entrance and exit ramps and would include reconstruction of Imperial Avenue from Ocotillo Drive north of the interchange to the southern extent of the proposed interchange reconstruction.

Alternatives 2, 4 and 5 would improve or solve:

- the need to accommodate local circulation system improvements
- out-of-direction traffic circulation on City streets
- operational characteristics, including safety
- restricted bicyclist and pedestrian access
- drainage conditions

All three “build” alternatives being considered incorporate current design standards, including the 1.5 km (.9 mi) required separation distance between urban interchanges. Of the original six alternatives considered, Alternatives 2, 4, and 5 were also the most reasonable in terms of construction costs. These three “build” alternatives differ in scope south of I-8 in terms of ramp configuration and amounts of new R/W required (see Summary & List Of Technical Studies, table S-1, *Summary of Project Features*). Final selection of an alternative for construction will not be made until after full evaluation of environmental impacts, full consideration of public hearing and review comments, and completion and approval of the Final Environmental Document.

## 2.2 PROJECT ALTERNATIVES DESCRIPTIONS

### *Alternative 1, No Action Alternative*

Alternative #1 is the No Action or “no-build” option. This alternative would propose no improvements or changes to the existing interchange (figure 1.2-1, *Project Alternatives and Study Area*). The No Action Alternative does not address elements of the purpose and need for the proposed project (as described in chapter 1 of this document) including:

- Accommodation of existing and planned growth and circulation system improvements within the city of El Centro and the local unincorporated Imperial County area south of the I-8/Imperial Avenue interchange
- Provision of improved access to existing and proposed developments south of I-8 (in conjunction with the southerly extension of Imperial Avenue by others)
- the provision of improved safety at the interchange
- the provision of improved drainage (appendix A, exhibit 8, *Existing Drainage General Flow*).

Although no construction costs are associated with this alternative, costs incurred with delay of commuter and truck traffic, traffic accidents, and maintenance would continue to increase through 2025 as regional population levels expand and associated traffic congestion worsens.

The No Action alternative would not provide consistency with the *City of El Centro General Plan* and *City of El Centro Redevelopment Plan*.

### *Shared Features of “Build” Alternatives 2, 4, & 5*

All three “Build” alternatives propose common features in their design configurations, including:

- Removal of the existing overcrossing and eastbound entrance and exit ramps.
- Partial removal of the existing westbound entrance and exit ramps.
- Reconstruction of the interchange with upgrades to the existing L-2 diamond configuration north of I-8.
- Construction of a three-lane westbound exit ramp and a single-lane westbound entrance ramp on the north side of I-8.
- Construction of traffic signal and safety lighting improvements for the westbound entrance and exit ramps at Imperial Avenue (north of I-8).
- Construction of noise abatement barriers near the existing right of way (R/W) line north of I-8 adjacent to residential developments east and west of the interchange (see chapter 3, section 3.7 for details of proposed noise abatement measures).
- Widening of Imperial Avenue north of the interchange to include four 3.6 m (11.8 ft) vehicle lanes, two 2.4 m (7.9 ft) shoulders, a 4.8 m (15.7 ft) left-turn lane, and 1.5 m (4.9 ft) sidewalks. The widening would meet existing pavement widths at the Ocotillo Drive/Imperial Avenue intersection. Lane-striping revisions would be made on Imperial Avenue north of the Imperial

Avenue/Ocotillo Drive intersection to accommodate traffic signal-loop modifications.

- Construction of a new overcrossing that would provide four 3.6 m (11.8 ft) vehicle lanes, a 4.8 m (15.8 ft) striped median that can accommodate a 3.6 m (11.8 ft) left turn lane or ramp access, and two 1.5 m (4.9 ft) sidewalks, and two .9 m (3 ft) bike lanes.
- All sidewalks and crosswalks within the project area will be compliant with the Americans with Disabilities Act (ADA).
- Construction of a drainage system in all four quadrants that would convey runoff from the roadway and slopes to ditches within basins created within the diamond-type interchange. Infiltration basins would be constructed to receive and dissipate runoff and to satisfy National Pollution Discharge Elimination System (NPDES) requirements (see appendix A, exhibits 9-12 for details of drainage design).
- Landscaping to blend with nearby structures and with the desert landscape (for details on soil erosion and possible landscaping measures, please see chapter 3, sections 3.8 and 3.14). A “gateway to the city” landscaping theme for the interchange will be developed and implemented by the Department for this project per a cooperative agreement with the city of El Centro and with input from the public. Landscaping removed by the project would be replaced as part of this project.
- Rehabilitation of the main lanes of I-8 would be performed as a separate project.
- No exceptions to design standards would be needed for this project.

Specific features of each “build” Alternative are described below.

### ***Alternative 2***

Alternative 2 is the alternative preferred from the engineering perspective since it provides the greatest ramp access and the highest traffic capacity. This interchange proposal is composed of a type L-2 diamond configuration north of I-8 and a type L-9 configuration south of I-8 (see figure 1.2-1, *Project Alternatives and Study Area* and appendix A, exhibit 6, *Alternative 2 LOS and ADT*). Included in the design are a four-lane Imperial Avenue overcrossing and a free-right-turn loop ramp to eastbound I-8. The loop ramp provides the optimum accommodation of current and future increases in traffic from southbound Imperial Avenue to eastbound I-8 by eliminating a conflicting left turn from southbound Imperial Avenue onto the eastbound I-8 on-ramp. This results in a higher level of operational movement and capacity in comparison with Alternatives 4 and 5. Alternative 2 has an estimated cost of \$26,000,000 which includes construction, design, right of way acquisition and support costs (highest-cost alternative of those considered for selection).

Alternative specific features are summarized below:

- Construction of an L-9 configuration south of I-8. This design includes a two-lane eastbound exit ramp and a single-lane 4.5 m (14.8 ft) loop ramp with a 55 m (180.5 ft) radius to eastbound I-8 for traffic southbound on Imperial Avenue.

Additional widening on eastbound I-8 is required to construct access from the eastbound loop entrance ramp and the 330 m (1082.7 ft) acceleration lane.

- The overcrossing structure would be constructed to 63 m (206.7 ft) in length and 28.2 m (92.5 ft) in width.
- The southern extent of work on the interchange reconstruction would be to just past the eastbound entrance ramp where it will connect with the proposed extension of Imperial Avenue to McCabe Avenue. The distance between the proposed interchange reconstruction and the I-8/Fourth Street intersection is 1.6 km (1 mi).
- No traffic signal traffic signal and safety lighting improvements would be required for the eastbound entrance and exit ramps.
- To accommodate this high capacity interchange design, a total of 5.0 hectares (ha)/12.4 acres (ac) of R/W acquisition would be required from two parcels in the southeast and southwest quadrants of the project. At an estimated total cost of about \$6,000,000, Alternative 2 has the highest R/W costs compared to the other alternatives selected for consideration. The additional R/W would be needed to accommodate part of the proposed overcrossing structure, the eastbound I-8 exit ramp, and the free-right-turn loop ramp to eastbound I-8. The needed R/W is currently vacant land, most of which is proposed for development as part of the Farmers Estates residential housing project. Farmer's Estates has been evaluated in a Final Environmental Impact Report (FEIR) and has an approved tentative map for construction. A portion of this project has been constructed in the western end of the project area but no work on the remainder has occurred for several years. The tentative map has received its last renewal and the project is subject to further discretionary approval of the City of El Centro in September 2003.
- Alternative 2 would provide a conflict for southbound Imperial Avenue pedestrians and bicyclists because they would cross the unsignalized ramp entrance to eastbound I-8. This bicycle and pedestrian crossing would be signed to minimize safety concerns.

Based on traffic intersection analysis, the free right turn (SB Imperial Avenue to EB on I-8) to the loop ramp at the southwest quadrant of the interchange would allow the intersection to accommodate higher traffic levels than currently forecast for 2025, given current land use and development assumptions. This characteristic is not shared by Alternative 4 and only partly by Alternative 5.

#### ***Alternative 4***

Alternative 4 proposes a westbound type L-2 diamond interchange north of I-8 and a type L-8 interchange south of I-8 (see figure 1.2-1, *Project Alternatives and Study Area* and appendix A, exhibit 7, *Alternative 4 LOS and ADT*). This design configuration forms a "T" intersection in the southeast quadrant of the interchange where the eastbound I-8 entrance and exit ramps would intersect Imperial Avenue. To accommodate the demolition and removal of the existing facility, a minimal amount of additional R/W would be needed to reconstruct the intersection. Alternative

4 is the lowest cost alternative with an estimated cost of about \$20,000,000 including capital construction, R/W acquisition and support.

Alternative specific features are summarized below:

- Construction of an L-8 configuration south of I-8. This includes a single-lane eastbound exit ramp and a two-lane eastbound entrance ramp. The eastbound I-8 exit ramp would incorporate a standard deceleration lane and a 4.5 m (14.8 ft) single-lane loop with a 55 m (180.5 ft) radius within the southeast quadrant of the interchange. The loop ramp would form a “T” intersection with the proposed southbound extension of Imperial Avenue and the eastbound I-8 entrance ramp. Additional widening on eastbound I-8 is required to provide for the 52 m (170.6 ft) loop ramp radius and the 180 m (590.5 ft) deceleration lane.
- The overcrossing structure would be constructed to 66 m (216.5 ft) in length and 28.2 m (92.5 ft) in width.
- The southern extent of work on the interchange reconstruction would be to just past the eastbound entrance ramp where it will connect with the proposed extension of Imperial Avenue to McCabe Avenue. The distance between the proposed interchange reconstruction and the I-8/Fourth Street intersection would be 1.6 km (1 mi).
- Eastbound entrance and exit ramps would meet traffic signal requirements and would involve traffic signal and safety lighting improvements.
- Right of way acquisition of approximately 2 ha (5 ac) south of I-8 would be required. The additional R/W needed south of the interchange would cost an estimated \$3,000,000. The needed R/W is currently vacant.

Traffic analysis indicates that Alternatives 4 has the greatest potential for congestion and deteriorated LOS when compared with other considered “build” alternatives if traffic volumes on Imperial Avenue continue to increase. Northbound traffic volumes would also cause operational conflicts with southbound left-turn traffic from Imperial Avenue onto the eastbound I-8 entrance ramp.

### ***Alternative 5***

This proposed alternative is a proposed diamond interchange composed of a type L-2 configuration north of I-8 and a type L-7 configuration south of I-8 (figure 1.2-1, *Project Alternatives and Study Area* and appendix A, exhibit 8, *Alternative 5 LOS and ADT*). Normally, the standard L-7 configuration includes a cloverleaf in two quadrants but, in this case, a single cloverleaf is proposed in the southwest quadrant. Alternative 5 has an estimated cost of \$22,000,000 including capital construction, right of way acquisition and support and is the intermediate-cost alternative.

Alternative specific features are summarized below:

1. Construction of an L-7 configuration south of I-8. This includes a two-lane eastbound exit ramp and a single-lane loop eastbound entrance ramp. The eastbound entrance and exit ramps south of I-8 would form a “T” intersection with the planned Imperial Avenue

extension. The eastbound I-8 entrance ramp would incorporate a 4.5 m (14.8 ft) single-lane loop with a 55 m (180.5 ft) radius within the southwest quadrant of the interchange. Additional widening on eastbound I-8 is required to accommodate the loop ramp radius and the acceleration lane entrance ramp.

2. The overcrossing structure would be constructed to 63 m (206.7 ft) in length and 28.2 m (92.5 ft) in width.
3. The southern extent of the interchange reconstruction would be to just past the eastbound exit ramp where it will connect with the proposed extension of Imperial Avenue to McCabe Avenue. The distance between the proposed interchange reconstruction and the I-8/Fourth Street intersection is 1.6 km (1 mi).
4. The eastbound entrance and exit ramps would meet traffic signal requirements and would involve traffic signal and safety lighting improvements.
5. This alternative would require R/W acquisition of approximately 4.3 ha (10.6 ac) from two parcels south of I-8. The additional right of way needed south of the interchange would cost an estimated \$6,000,000. Additional R/W would be needed to accommodate the extension of the overcrossing structure, the eastbound I-8 exit ramp and the 55 m (180.4 ft) radius loop entrance ramp. The needed R/W is currently vacant and proposed for development as part of the Farmers Estates residential housing project (described above in alternative specific features of Alternative 2).

Based on traffic intersection analysis, the free right turn (SB Imperial to EB on I-8) to the loop ramp at the southwest quadrant of the interchange would allow the intersection to accommodate higher traffic than that currently forecast for 2025, given current land use and development assumptions. This characteristic is not shared by Alternative 4. It is, however, not as efficient as Alternative 2 in accommodating future traffic growth.

### **2.3 ALTERNATIVES CONSIDERED AND ELIMINATED**

Of six alternatives considered for the reconstruction of the I-8/Imperial Avenue interchange, Alternatives 3 and 6 were eliminated because they failed to reasonably fulfill the project objectives. A type L-1 interchange alternative was not considered since it would have required acquisition of R/W within developed areas north of I-8 in order to accommodate drainage basins and to avoid construction of retaining walls (interchange types discussed in this chapter are illustrated in appendix A, exhibit 2). No mass transportation alternatives were considered to feasibly meet the purpose and need for this project. There are no existing or planned Light Rail Transit (LRT) projects within the project limits. The Imperial County Transit System provides transit service within this mainly agrarian county and connects with Greyhound for interregional trips. No Transportation System Management (TSM) alternative was considered since this limited construction alternative is usually relevant only for major projects proposed in urbanized areas with a population over 200,000.

#### ***Alternative 3***

Alternative 3 was a variation of Alternative 2 and provided for a westbound on-ramp to I-8 (L-9 Modified Partial Cloverleaf interchange type). Alternative 3 proposed an L-9 interchange for both the westbound and eastbound on-ramps. This alternative was not considered further because the predicted northbound Imperial Avenue to westbound I-8 traffic volumes did not justify the

additional capacity provided by the addition of a loop ramp. The L-9 design would also have required a design exception to avoid acquisition of developed residential and commercial properties in the northeast and northwest quadrants.

***Alternative 6***

Alternative 6 incorporated the L-13 (Urban Single Point) interchange type for both the westbound and eastbound entrance ramps. The design for this alternative was found to be more appropriate for larger, more heavily congested urbanized areas. Higher costs associated with the increased structural width and depth of the overcrossing design and need for additional lanes, as well as the round design for all four ramps, were determined not to be justified when compared to the benefits provided by Alternatives 2, 4 and 5.

