# Airway Boulevard Feasibility Study for City of El Paso

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# APPENDICES

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# 1.0 EXECUTIVE SUMMARY

The purpose of the Airway Boulevard Feasibility Study was to identify feasible alternatives for a north-south connector between the south side of the City of El Paso and the area north of IH-10 in order to connect citizens to a retail district and the El Paso International Airport. The focus of the study was between Trowbridge Drive/North Loop Drive and IH-10. Given that Hawkins Boulevard is currently the major north-south roadway that serves the surrounding study area, an additional connection is needed. The study area is primarily industrial and contains major railroad lines, above and below ground utilities, and a number of potential environmental issues. Surrounding the study area are business and residential areas. While transportation improvements were recommended within the study area boundaries of IH-10 on the north side, Trowbridge Drive/North Loop Drive on the south side, Marlow Road on the western side and Hawkins Boulevard on the east side, it was important to determine the regional effect of potential solutions.

## 1.1 PUBLIC INVOLVEMENT

The public meeting component of this study was comprised of two public meetings and four stakeholder meetings. Each of the public meetings provided the public with the opportunity to view study progress through presentations, displays, and interaction with the Study Team. During the public meetings, the general public provided comments and direction to the Study Team. The Stakeholder Committee Meetings consisted of business owners, City officials, and other various agencies. The stakeholders provided direction to the Study Team

## 1.2 STUDY GOALS

Through meetings with local citizens and Stakeholders, the following project goals were developed:

- Improve north-south mobility
- Minimize truck traffic in residential areas
- Minimize safety risks, exposure and impacts to refineries
- Construct roadway for a reasonable cost
- Minimize railroad impacts and crossings
- Minimize environmental and social impacts

## 1.3 EVALUATION OF ELIMINATING TROWBRIDGE DRIVE

It is recognized that the purpose of closing Trowbridge Drive between Marlow Road and Delta Drive was initiated by Western Refining. The purpose for Western Refining to close this portion of Trowbridge Drive was to minimize security risks to the refinery and surrounding neighborhoods. Trowbridge Drive is a major four-lane divided arterial that


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connects IH-10 and North Loop Drive. North Loop Drive is a major six-lane divided arterial that provides east-west movement within the City of El Paso. As Trowbridge Drive provides access for businesses and residences, it serves a variety of purposes. From a security perspective, closing Trowbridge Drive would minimize exposure to Western Refining. However, the purpose of this report was to focus on transportation issues. From a transportation perspective it is recommended that Trowbridge Drive remain open for the following reasons:

- If closed, nearly two lanes of traffic would move to Alameda Avenue
- If closed, additional traffic would shift to IH-10 between Trowbridge Drive and Airway Boulevard
- Trowbridge Drive is an alternate route for IH-10 during periods of congestion
- Negative impacts to north-south streets such as Clark Drive and Delta Drive
- Negative impacts to Sun Metro bus routes

## 1.4 EVALUATION OF RELOCATING THE RAILROAD

Four railroad relocation options were developed. All of these options assume that Trowbridge Drive would be closed in order to provide the benefit of eliminating an at-grade railroad crossing at North Loop Drive. However, closing Trowbridge Drive was not determined to be a feasible option. All of the options travel through the Western Refining property and as a result would cause heavy impacts to refinery operations, so these options were eliminated. Additionally, any option that assumed the railroad was to be relocated was also eliminated.

## 1.5 RECOMMENDATIONS

After the initial data collection phase was completed, a number of Conceptual Alternatives was developed through meetings with local citizens and stakeholders. The study consisted of a fatal flaw analysis in order to evaluate the alternatives based on engineering, environmental, and mobility impacts to the area as well as public input. The alternatives carried forward were then evaluated in increasing detail based on project goals. It was determined that implementing the recommendations in a phased plan would divide the expected impacts to utilities, land uses, and the environment in more manageable doses while providing benefits to the transportation system. Therefore, the alternatives were divided into three phases. Each phase resulted in increasing impacts and benefits to the transportation system.

### 1.5.1 Phase 1 Recommendations

The purpose of the Phase 1 recommendations was to provide trucks within the Industrial Park an alternate route to Hawkins Boulevard in order to access IH-10. With this goal in mind, the Phase 1 recommendation was to provide a two-lane connection between Airway Boulevard and Market Avenue. The estimated cost for the two-lane connector is $2.6 million, excluding environmental remediation.


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Phase 1 recommendations are independent of the planned upgrade of Hawkins Boulevard to six lanes. The planned upgrade of Hawkins Boulevard will include implementing a corridor access management scheme along Hawkins Boulevard that could include but is not limited to the following improvements:

- Driveway/access consolidation
- Signal timing improvements along Hawkins Boulevard for Commerce Street, Industrial Avenue, and Market Avenue
- Intersection improvements along Hawkins Boulevard for Commerce Street, Industrial Avenue, and Market Avenue

As shown in **Figure 1-1**, the two-lane connector would be modified during Phase 2.

### 1.5.2 Phase 2 Recommendations

The purpose of Phase 2 was to provide a direct connection between North Loop Drive and IH-10 while incorporating the recommendations from the first phase. Phase 2 recommendations would result in significant benefit to the transportation system while resulting in high impacts to utilities, land use, and the environmental factors. The Phase 2 recommendation was to provide a four-lane roadway between Airway Boulevard and Delta Drive. As shown in **Figure 1-1**, the two-lane connector between Airway Boulevard to Market Avenue would be modified during Phase 2. The estimated construction cost for this option is $30 million, excluding environmental remediation.

Environmental remediation is a major factor that will need to be studied as a future effort for each phase. While a great deal of effort was taken to identify potential environmental impacts, this study did not determine the level of clean up or remediation with each of the recommended solutions.

### 1.5.3 Phase 3 Recommendations

Phase 3 recommends a future study that would determine a potential extension from the Phase 2 improvement down to Border Highway. A connection from IH-10 to Border Highway would provide several benefits to the transportation system both locally and regionally. A connection between IH-10 and Border Highway could be used to move the hazardous cargo designation from Delta Drive to the new roadway. Designating a proposed roadway between IH-10 and Border Highway as a hazardous cargo route would reduce the truck traffic within the neighborhoods along Delta Drive. In addition to Delta Drive, truck traffic is also expected to be reduced along Hawkins Boulevard, Alameda Avenue, North Loop Drive, and Trowbridge Drive. Truck traffic currently uses all of these roadways in order to reach the study area. As Yarbrough Drive and Zaragoza Drive are currently the only north-south roadways that connect Border Highway to IH-10 between IH-10 and Joe Battle Freeway, a new roadway would provide significant mobility benefits to the region.

While this study focused on the area between IH-10 and Trowbridge Drive/North Loop Drive, it is recommended that a future study determine the location and feasibility of constructing a north-south roadway that would continue the connection proposed in


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Phase 2 down to Border Highway. Possible study locations of this new roadway would include but are not limited to the east end of Azcarate Park as well as the existing drainage easement east of the park.

The figure on the following page shows the recommendations.

## 1.6 ACTION PLAN

The success of implementing the recommended solutions is dependent on the coordination between a variety of entities. This section attempts to identify the roles and responsibilities of each agency in meeting the goals of this study along with a suggested action plan.

| Steps | | Agency |
|---|---|---|
| 1. | Policy board approval of study | El Paso MPO |
| 2. | Secure funding of Phase 1 improvements | City and TxDOT |
| 3. | Environmental documentation and preliminary schematic design for Phase 1 recommendations | City and TxDOT |
| 4. | Final design of Phase 1 recommendations | City and TxDOT |
| 5. | Hawkins Boulevard upgraded to six-lanes as planned along with implementation of corridor access management strategies | MPO, City and TxDOT |
| 6. | Construction of Phase 1 recommendations including coordinating utility relocations | City and TxDOT |
| 7. | Perform Feasibility Study for Phase 3 Improvements to determine potential connection to Border Highway | MPO, City, and TxDOT |
| 8. | Secure funding of Phase 2 improvements | MPO and TxDOT |
| 9. | Environmental documentation and preliminary schematic design for Phase 2 recommendations | City and TxDOT |
| 10. | Final design of Phase 2 recommendations | City and TxDOT |
| 11. | Construction of Phase 2 recommendations including coordinating utility relocations | City and TxDOT |
| 12. | Secure funding of Phase 3 improvements | MPO and TxDOT |
| 13. | Environmental documentation and preliminary schematic design for Phase 3 recommendations | City and TxDOT |
| 14. | Final design of Phase 3 recommendations | City and TxDOT |
| 15. | Construction of Phase 3 recommendations including coordinating utility relocations | City and TxDOT |


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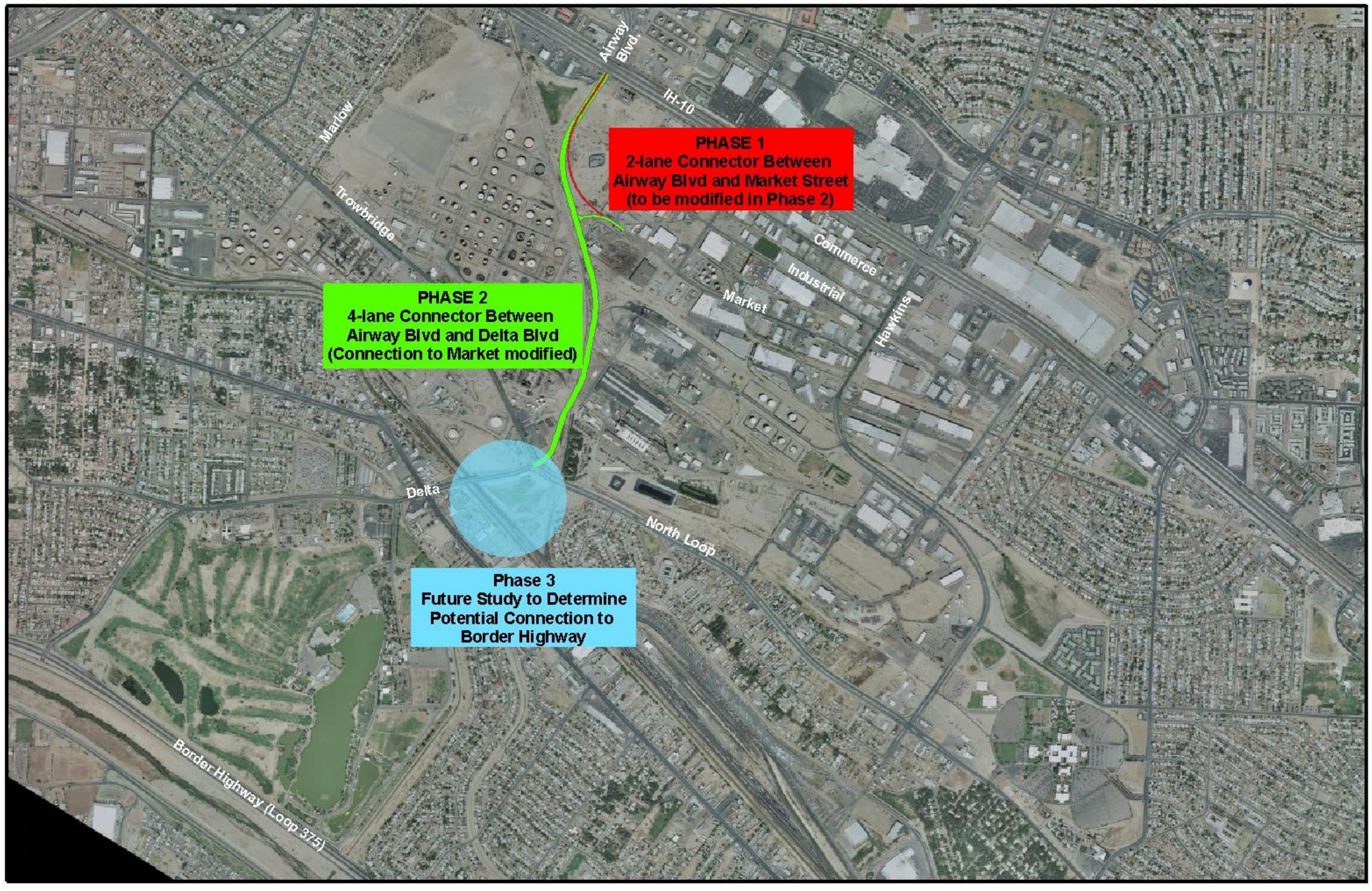


**Figure 1-1 Recommended Alternatives**


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# 2.0 STUDY DESCRIPTION

The primary focus of this study is Airway Boulevard, between IH-10 and Trowbridge Drive/North Loop Drive, located in the heart of El Paso. Airway Boulevard is a principle six-lane north-south arterial, approximately 2.5 miles from the Border Highway. Airway Boulevard is a major connection between the El Paso International Airport and IH-10. El Paso is located on the Texas-Mexico border and serves as a major location for international trade. As El Paso's sister city in Mexico, Ciudad Juarez is the largest city in the state of Chihuahua and the fifth largest city in all of Mexico. Given the regional and international importance of El Paso, it is important to provide sufficient infrastructure in order to promote continued economic development to the area.

Stimulated by both the NAFTA program and the Mexican maquiladora program, the international trade has continued to help fortify the economy and resulted in El Paso-Ciudad Juarez to be ranked 16$^{th}$ in trade among the largest Metropolitan Statistical Areas in the U.S. Twenty-five percent of all trade between the U.S. and Mexico crosses at the El Paso-Ciudad Juarez border. Given that this is a high trade area, the population increases within the El Paso-Ciudad Juarez area is double the national average. According to City studies, the projected population growth alone within the City of El Paso will be approximately 15% between 2005 and 2012. Additionally, the close proximity to the over one million potential retail customers from Juarez has continued to encourage the retail industry within the City of El Paso.

In order to manage a number of issues that are unique to the border region, several local, state, and federal agencies are located within the City. Federal agencies such as the Immigration and Naturalization Services (INS), Drug Enforcement Agency (DEA), and U.S. Customs Service, regulate the flow of goods and services across the border. With a substantial number of public school enrollments, the local school districts must have sufficient labor force in order support local education efforts. Finally, as the largest Air Defense Training Center in the world, Fort Bliss, contributes a local impact to the economy as well as opportunities for civilian employees in the El Paso area.

## 2.1 STUDY AREA

Given the international trade importance, large metropolitan population base between both border cities for retail, and the wide range of government services within the City, it is necessary to provide a sufficient transportation infrastructure that supports all of these services and activities. While this study focuses on the feasibility of conceptual alternatives within a study area between IH-10 and Trowbridge Drive/North Loop Drive, the results have both local and regional implications to the City of El Paso. Ultimately, these north-south conceptual alternatives will connect the southern area near the border to the north area of the City near the El Paso International Airport. Additionally, the alternatives will provide a more direct route for travelers from the south side of the City to reach large retail centers located north of IH-10.


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As shown in **Figure 2-1**, the study area is primarily an industrial area. Western Refining Company along with Chevron-Texaco owns the majority of the western portion of the study area while Phelps-Dodge Mining Company operates on the east side. Union Pacific operates a railroad that is located between the refinery and mining company. The northeast corner of the study area accommodates an industrial park with a number of different businesses while a trucking distribution center is located at the connection of IH-10 and Airway Boulevard. Residential areas are found on the western, southern, and eastern sides of the study area. Additional information on the existing conditions is discussed in a later chapter.


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**Figure 2-1 Study Area**




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## 2.2 REGIONAL IMPORTANCE

Located on the border with Mexico, the City of El Paso is currently the fifth largest City in Texas and the 23rd largest City in the U.S. El Paso's sister city, Ciudad Juarez, located across the Mexican border is currently the state of Chihuahua's largest city and the fifth largest city in all of Mexico. With the downtown areas within walking distance of each other, El Paso and Ciudad Juarez provide the largest metropolitan area on the border between the U.S. and Mexico. El Paso's location provides good opportunities for businesses to access markets in Mexico; the ability to capitalize on the North American Free Trade Agreement (NAFTA) and maquiladora industry; and a strategic proximity to markets in North America. The City of El Paso must provide the needed transportation infrastructure to accommodate regional and local traffic. While this study is focused on an area between IH-10 and Trowbridge Drive/North Loop Drive, the proposed route can become an important piece to rerouting local traffic so that regional traffic routes are alleviated from congestion, as well as provide better access to retail, businesses, and the El Paso International Airport.

### 2.2.1 NAFTA

Formed as the second largest free-trade block when it took effect in 1994, the NAFTA promoted the gradual removal of trade barriers on most goods produced and sold in North America. The agreement opened up markets between the U.S., Mexico, and Canada by lowering trade tariffs. According to Department of Commerce statistics, El Paso has doubled its exports to Mexico. As trade between the U.S. and Mexico has increased, El Paso has developed into a central hub for the promotion of the local, regional, and national economy. As a result, El Paso must provide the needed transportation infrastructure to support these activities.

### 2.2.2 Maquiladora Program

A maquiladora is a manufacturing facility located in Mexico that temporarily imports materials for assembly, without payment of tariffs. Approximately 300 maquiladoras employ 220,000 workers in Ciudad-Juarez. Nearly 2,500 managers, engineers, and other professionals make daily border crossings from El Paso to plants in Ciudad-Juarez. It was estimated by the El Paso Chamber of Commerce that the 300 'maquilas' in Juarez will buy $8 to $10 billion worth of goods from El Paso. Additionally, approximately 25% of U.S./Mexico trade passes through El Paso, which is second only to Laredo in annual truck crossings.

### 2.2.3 El Paso International Airport

The El Paso International Airport has become a major destination for passengers and cargo during its 75 years of operation. With over 166 combined arrivals and departures per day between seven commercial passenger airline companies, the airport moves over 3 million passengers per year. As a major intermodal hub on the U.S./Mexico border, the El Paso International Airport provides one of the largest air cargo centers along the border.


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## 2.3 LOCAL IMPORTANCE

A new location route should provide improved access for the local area. With a major mall and retail stores located north of IH-10, it is important to provide sufficient access as well as desirable roadway capacity. While the study area boundary primarily includes industry, residential neighborhoods and other businesses are in close proximity. Therefore, the interaction of heavy industry and neighborhood traffic causes potential safety issues. Also, an additional route between IH-10 and Trowbridge Drive/North Loop Drive would improve circulation for the industrial area and neighborhoods and thereby reduce truck traffic through the residential areas.

### 2.3.1 Retail

In addition to the goods trading between the U.S. and Mexico within the City of El Paso, the City has access to over one million potential retail customers from Juarez, as well as the local population. With potential shoppers traveling from Mexico into the City, it is important to provide sufficient local movements into the large retail areas. A large retail area is located north of IH-10 along Airway Boulevard, which is very close to the focused study area. Therefore, it would be beneficial to provide a reasonable option for travelers to access businesses north of IH-10 from the south side of the City.

### 2.3.2 Safety

The interaction of heavy trucks and local neighborhood traffic has become a concern, according to local citizens. The major truck routes to IH-10 from the study area include using Trowbridge Drive, North Loop Drive, and Hawkins Boulevard. Trowbridge Drive is a major arterial that splits a residential neighborhood. The houses on the north side of the street are separated from traffic by a median while the majority of the residences on the south side of Trowbridge Drive are right next to the traveled way. With the number of driveways and proximity of housing to a major arterial, heavy truck traffic poses safety issues to the area. North Loop Drive is a recently upgraded six-lane divided arterial that provides access to neighborhoods and businesses located along the roadway. Hawkins Boulevard is a north-south arterial that provides direct access to IH-10 for various industries and businesses.

### 2.3.3 Circulation

An additional north-south roadway within the study area would provide improved circulation for business and neighborhood traffic. As some of the major destinations such as the mall and other retail stores are just north of IH-10, a new north-south roadway would allow for drivers to have an additional option other than Hawkins Boulevard. Also, additional circulation would benefit the industrial area on the northeast corner of the study area.


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## 2.4 PURPOSE AND NEED

Through a collaboration of the Stakeholder Committee, Study Team, and general public, a study purpose and need statement was developed. The purpose of this study was to improve north-south mobility and minimize safety risks to residents and employees of neighboring businesses. The result of this study was the identification of a group of alternatives that are feasible and best meet the study area's transportation needs while minimizing impacts to the surrounding area.

A proposed alignment within the study area links the south side and north side of the City. As the City of El Paso provides the location of a major border crossing, an additional north-south roadway has the potential of accommodating the regional traffic load. Not only would a new roadway provide an additional option that would link either side of the City, it could also potentially alleviate heavily traveled routes that serve the same function. The focus of the local mobility goals center on safety, circulation, access to retail centers, and El Paso International Airport. As safety and efficiency are the ultimate goals of any transportation system, it is important in this study to minimize the interaction between heavy truck traffic and local passenger car traffic.

## 2.5 STUDY GOALS

The input of City officials and public stakeholders was extremely important to the development of the specific goals of this study. Through a number of meetings with City officials, local residents and business owners, the following study goals for the project were determined.

- Improve north-south mobility
- Minimize truck traffic in residential areas
- Minimize exposure and impacts to industrial area
- Construct roadway for a reasonable cost
- Minimize railroad impacts and crossings
- Minimize environmental and social impacts

The feasibility study resulted in the identification of several alternatives that meet these project goals. The purpose of this study was to provide the City with an analysis of the feasibility of identified alternatives. The overall focus of the Airway Boulevard Feasibility Study was to provide improved north-south mobility between the area south of the Study Area and the north section of the City near the El Paso International Airport. As discussed previously, the study focuses on improvements between IH-10 and Trowbridge Drive/North Loop Drive.


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## 2.6 METHODOLOGY

Throughout the study, each alternative was measured against the stated purpose and need of the project as well as concerns expressed by the local community. The level of detail at which each alternative was studied increased as the number of alternatives analyzed decreased. As the focus of the study resulted in determining feasible alternatives, the constructability and viability of the alternatives were developed in sufficient detail.

### 2.6.1 Study Process

The study was broken into a two-phase process consisting of a Conceptual Alternatives Analysis and Viable Alternatives Analysis. The Conceptual Alternatives were determined by the Study Team as well as public input. The Viable Alternatives were the options carried forward through the fatal flaw analysis.

#### 2.6.1.1 Phase 1 – Conceptual Alternatives Analysis

The first phase consisted of identifying existing conditions, developing Conceptual Alternatives, and performing a fatal flaw analysis. The existing conditions for the study area were compiled through field reconnaissance and data research that allowed the Study Team to understand the area constraints. The alternatives were developed with general public and Stakeholder Committee input. The fatal flaw analysis evaluated each alternative using order of magnitude engineering, mobility, and environmental impacts. The Study Criteria is explained in more detail later in this chapter. The alternatives carried forward through the fatal flaw analysis were considered the Viable Alternatives.

#### 2.6.1.2 Phase 2 – Viable Alternatives Evaluation

Each of the Viable Alternatives was evaluated based on specific criteria relating to each study goal. As with the first stage, the general public and Stakeholder Committee were presented with Viable Alternatives in order to make adjustments to the alignments and reach consensus. Through the detailed screening of the Viable Alternatives, a group of alternatives were carried forward. The following sections described how each study goal was quantified.

##### 2.6.1.2.1 Improve North-South Mobility

The stated purpose of this study was to improve the mobility and accessibility between the south side of the City and the large retail centers and El Paso International Airport on the north side of the City. Currently, there is not a major north-south route that serves the properties near the study boundary. While Hawkins Boulevard is considered a major arterial, it only provides connection north of North Loop Drive. However, due to congested conditions along this roadway and the fact that it might be considered somewhat of a circuitous route it does not always offer the most desirable alternative. In order to compare each of the Viable Alternatives vehicle-miles of


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travel, vehicle-hours of travel, region-wide delay, travel time, and the effect on other roadways were evaluated.

#### 2.6.1.2.2 Minimize Truck Traffic in Residential Areas

Local residents explained that the heavy truck traffic near their neighborhoods has become very high and that safety problems have occurred. Due to the heavy interaction between residents and heavy trucks, one of the goals of this study is to minimize truck traffic in residential areas. Viable Alternatives were compared based on the decrease in number of trucks in the residential areas and determining the effect of the hazardous cargo route.

#### 2.6.1.2.3 Minimize Exposure and Impacts for Industrial Areas

Due to heightening security for different industries, it is important to evaluate exposure for industries. In an effort to protect surrounding residents and business owners, the alignments were evaluated based on number of vehicles exposed to the refineries. Additionally, it is important to minimize the impacts to the industries. Therefore, alternatives were also compared based on utility, railroad, and tank impacts. While this study will evaluate exposure, recommendations will be presented from a transportation perspective.

#### 2.6.1.2.4 Construct Road for Reasonable Cost

While cost is not the determining factor in a feasibility study, it must be evaluated. Therefore, each alternative was compared based on preliminary cost estimates. The constructability was also evaluated for each alternative.

#### 2.6.1.2.5 Minimize Railroad Impacts and Crossings

Impacts to railroad lines can cause a number of issues. At-grade railroad crossings could cause potential safety problems and delay for motorists. Additionally, an impacted railroad line could effect operation and therefore impact businesses that are dependent on the rail. In order to evaluate an alternative using this goal, the number of new railroad crossings was determined.

#### 2.6.1.2.6 Minimize Environmental and Social Impacts

Each alternative was evaluated based on its impact to environmental and social features. The examples of the environmental features are discussed below in the study criteria.

### 2.6.2 Study Criteria

The evaluation process for each of the alternatives included environmental, engineering, mobility, and public involvement. The alternatives were evaluated using the criteria that make-up the overall categories. The alternative evaluation was performed using the


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criteria described below. The evaluation criteria were presented to the general public and Stakeholder Committee for review.

### 2.6.2.1 Engineering

#### 2.6.2.1.1 Constructability

This criterion identified the complexity of the construction for each alternative based on interchanges, intersections, bridges, and other potential impacts. Also included in constructability was the complexity of construction phasing in order to maintain access and efficient traffic flow.

#### 2.6.2.1.2 Relative Cost

A preliminary cost estimate was prepared for each alternative based on an order of magnitude cost of right-of-way, structural, earthwork, utility relocation, drainage structures, and roadway cost. Given the nature of industry operation within the study area, significant environmental remediation is expected. The cost estimate did not include environmental clean-up.

#### 2.6.2.1.3 Safety

This criterion was evaluated based on the ability of each alternative to provide a safe environment for drivers and pedestrians within the corridor. Safety was determined based on design criteria, access points and interaction between pedestrians and vehicles.

### 2.6.2.2 Environmental

#### 2.6.2.2.1 Potential Land Use Impacts

This criterion evaluated the land use impacts for each alternative in order to determine which alternative resulted in minimal adverse human, financial, and infrastructure effects. Each alternative was evaluated in order to determine the maximum positive impacts. The land uses investigated included commercial/industrial, agricultural, public facilities, residential, religious facilities, schools, and utilities.

#### 2.6.2.2.2 Displacements

This criterion evaluated the number of businesses and/or residences that would be displaced for each alterative.

#### 2.6.2.2.3 Archeological/Cultural Resources

This criterion evaluated the potential number and extent of impact to archeological and historical sites that each alternative would impact.


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#### 2.6.2.2.4 Water Resources

The impacted surface water features, ground water related features, wetland features, floodways, and 100-year floodplain areas impacted by each alternative were evaluated by this criterion.

#### 2.6.2.2.5 Ecological Resources

Any threatened/endangered species habitat types in the area were evaluated with this criterion.

#### 2.6.2.2.6 Hazardous Materials

This criterion included an overview investigation into the potential hazardous waste elements within each of the studied alternatives.

### 2.6.2.3 Mobility

#### 2.6.2.3.1 Regional Mobility

This criterion evaluated the ability of each alternative to maximize the movement of vehicle and persons throughout the region. As IH-10 provides the major regional movement in the area, each alternative was evaluated based on its access to the interstate.

#### 2.6.2.3.2 Local Travel Efficiency

Each alternative was evaluated based on order of magnitude travel times through the study area. Additional characteristics including delay caused by intersections, access points, and other capacity constraints were included in the evaluation.

### 2.6.2.4 Public Involvement

#### 2.6.2.4.1 Stakeholder Meeting

Along with the Study Team, the Stakeholders consisted of public officials and potentially effected business owners. Four Stakeholder meetings were held throughout the life of the project. The Stakeholders were influential in developing project goals, conceptual alternatives, and providing additional information on local concerns.

#### 2.6.2.4.2 Public Meetings

Two public meetings were held throughout the life of the project. The general public provided input on conceptual alternatives and additional information on local concerns.

#### 2.6.2.4.3 Newsletters

In an effort to provide information on upcoming meetings and project progress, two newsletters were sent to property owners that were


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affected by the potential alternatives. The purpose of the newsletters was to provide educational information, study progress, and meeting times and locations. Persons that did not receive project newsletters by direct mail were able to obtain copies through the City and from the project website. Newsletters were also distributed by special request for independent use in community or civic meetings. Copies in both English and Spanish were made available as handouts during public meetings.

#### 2.6.2.4.4 Website (www.airwaystudy.com)

Additional effort to properly inform the public was made through the creation and maintenance of the project website. The website provided up-to-date project information and made available various newsletters and presentation material.


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# 3.0 EXISTING STUDY AREA CHARACTERISTICS

An assortment of factors plays into the existing conditions of the study corridor. Identifying the existing conditions was important so that potential impacts for each alternative could be determined during the evaluation. The Study Team collected information from the following organizations to create this chapter:

- El Paso Water Utilities
- Union Pacific Railroad
- City of El Paso
- Western Refining Company
- Phelps-Dodge Mining Company
- Chevron-Texaco
- Texas Department of Transportation
- El Paso Metropolitan Planning Organization
- El Paso Electric
- Sun Metro

The existing study area characteristics found in the following sections form the framework for recommendations made in later chapters. Information is presented with maps, charts, and spreadsheets. A brief description highlights key elements and explains the significance of the characteristic. The following sections is an introduction to the existing conditions in the study area by highlighting the following features:

- Traffic characteristics
- Roadway characteristics
- Electric utilities
- Underground gas and product lines
- Water and sewer lines
- Drainage structures
- Railroad lines
- Environmental background

Be assured that the report will refer back to this chapter occasionally and when appropriate will expand upon this information in order to examine roadway alternatives and detail impacts to the existing environment. **Figure 3-1** provides an overview of the information provided.


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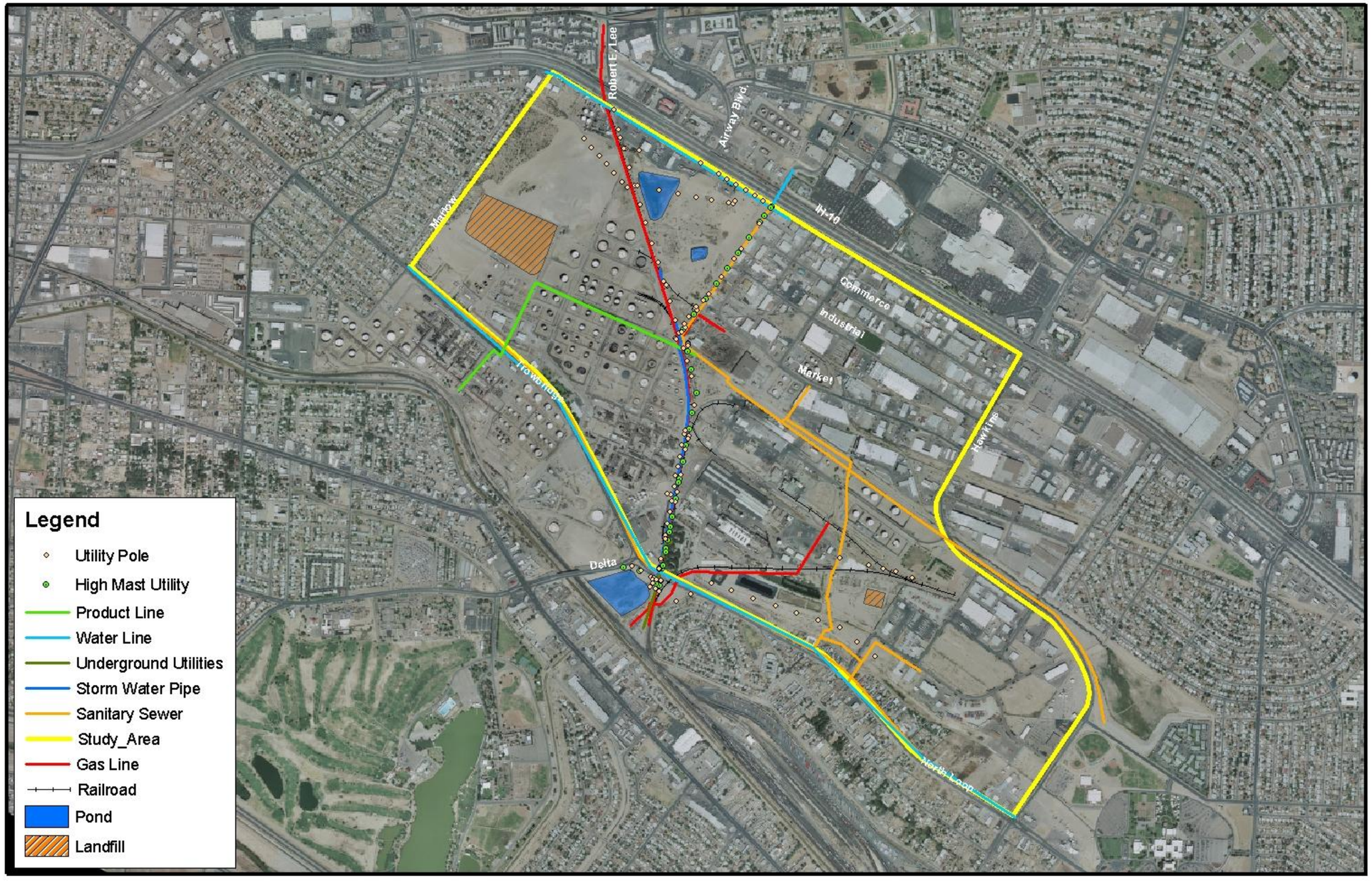


**Figure 3-1 Existing Conditions**


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## 3.1 EXISTING TRAFFIC CHARACTERISTICS

The City has a number of roadways that make up the existing transportation network in the study area. The primary focus of this study was on the roadways that have the potential to be directly impacted by or used as an alternative route in order to improve north-south mobility. **Table 3-1** and the adjacent map identify these roadways, their functional classification, existing configuration, average daily traffic volumes, and estimated capacity. Existing volumes were derived from traffic counts performed by TxDOT. Estimated roadway capacities were generally applied to the roadway types as adapted from the *Highway Capacity Manual, 2000*. The estimated capacity was calculated based on the maximum service flow rate, peak hour factor, and an assumed K-value of 10%.

**Figure 3-2 Traffic Counts**


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**Table 3-1 Study Area Roadways**

| Existing Roadways | Functional Classification | Existing Configuration | Existing Volume (ADT)* | Estimated Capacity (ADT) | 2025 MPO Volumes |
|---|---|---|---|---|---|
| Airway Boulevard | Major Principal Arterial | 6-lane divided | 34,000 | 40,000 | 44,000 |
| Robert E. Lee | Minor Arterial | 2-lane | 4,300 | 12,000 | 16,500 |
| IH-10 | Freeway | 8-lane with 3-lane Frontages | 260,000 | 280,000 | 270,000 |
| Trowbridge Drive | Major Arterial | 4-lane divided | 14,000 | 26,000 | 20,000 |
| North Loop Drive | Major Principal Arterial | 6-lane divided | 21,000 | 40,000 | 46,000 |
| Delta Drive | Major Principal Arterial | 6-lane divided | 15,000 | 40,000 | 30,500 |
| Hawkins Boulevard | Major Principal Arterial | 4-lane divided and undivided | 15,000 | 26,000 | 40,000 |
| Industrial Avenue | Local Street | 2-lane | 3,150 | 12,000 | 12,500 |
| Market Avenue | Local Street | 2-lane | 3,000 | 12,000 | 12,500 |

***2002 TxDOT Traffic**


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## 3.2 ROADWAY CHARACTERISTICS

While the previous section identifies the existing transportation network in the study area, this section further details the characteristics of these roadways. Features such as hazardous cargo routes, transit routes, and roadway context zones illustrates the fundamental characteristics of the roadway.

### 3.2.1 Hazardous Cargo Routes

Delta Drive, Trowbridge Drive, and IH-10 are designated hazardous cargo routes within the study area. Therefore, trucks carrying hazardous cargo must navigate several turning movements to travel between the Border Highway and IH-10. In the study area, hazardous cargo vehicles must use Trowbridge Drive, which cuts through an existing stable residential neighborhood. **Figure 3-3** below describes the hazardous cargo routes in the study area.

**Figure 3-3 Hazardous Cargo Routes**


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### 3.2.2 Context Zones

Context zones seek to describe the character and activities associated with the adjacent land uses and development to the roadway. A key concept in context sensitivity is mutual support of thoroughfare and context that achieves compatibility in both the physical and operational senses. This characterization provides for consideration of the contexts of community, environment, and transportation needs and how these contexts can knit together to improve mobility and quality of life. Hence, the context zones account for:

- Thoroughfare function
- Land use and transportation integration
- Character within the right-of-way and of adjacent land and development
- Activity generated by both adjacent development and the right-of-way
- Environmental compatibility
- Community values

#### 3.2.2.1 Land Use

Land use is a common basis for characterizing urban development and for determining vehicle trip generation. Land use is an important contributor to context and a major factor in the selection of roadway type. For example, in all context zones residential blocks are expected to have a lesser demand for a wide travel way than will industrial blocks. Similarly, a thoroughfare with commercial blocks generates higher volumes of vehicular traffic and need for freight delivery and thus generally requires more and wider travel lanes, and wider parking lanes to accommodate a higher turnover of on-street parking. Thus, a predominantly commercial thoroughfare requires a wider travelway.

#### 3.2.2.2 Three Context Zones

Three context zones guide the characterization of roadways in the study area. In determining these context zones the Study Team has considered both existing conditions and plans for the future, recognizing that thoroughfares often last longer than adjacent land uses. Each roadway in the study area has at least one context zone associated with it, some may have overlap of multiple context zones. The following context zones will aid in characterizing the surrounding roadways. These zones will also prove to be important in later chapters that discuss new roadway alternatives.


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#### 3.2.2.2.1 Commercial Context

Roadways in this context zone are focused on moving traffic and providing access to businesses. Thus these roadways characteristically have six to eight travel lanes that range from 11-feet to 12-feet wide, a high number of access points for developments, and minimum pedestrian and bicycle facilities.

#### 3.2.2.2.2 Industrial Context

Roadways in this context zone are typically designed for large vehicles, which means lane widths are wider than normal (13-feet to 15-feet). Sidewalks, when present are usually attached and a small planting strip maybe on the outside of the sidewalk. On-street parking, medians, bicycle lanes, and street trees are usually absent from the street design.

#### 3.2.2.2.3 Residential Context

Roadways in the residential context zone seek to balance multimodal mobility with land access. As collectors, residential streets are designed to emphasize walking, bicycling, and land access over mobility. In both cases, residential streets tend to be more pedestrian-oriented than commercial and industrial streets. Residential streets generally consist of two to four travel lanes that are 11-feet to 12-feet wide and have on-street parking, medians, landscaping, and transit facilities.

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### 3.2.2.3 Study Area Context Zones

Based upon the factor described above, the Study Team defined Context Zones for six roadways in the study area. The following context zones were used:

Some locations have an overlap of context. These locations require special attention because they may have conflicting priorities for the roadway.

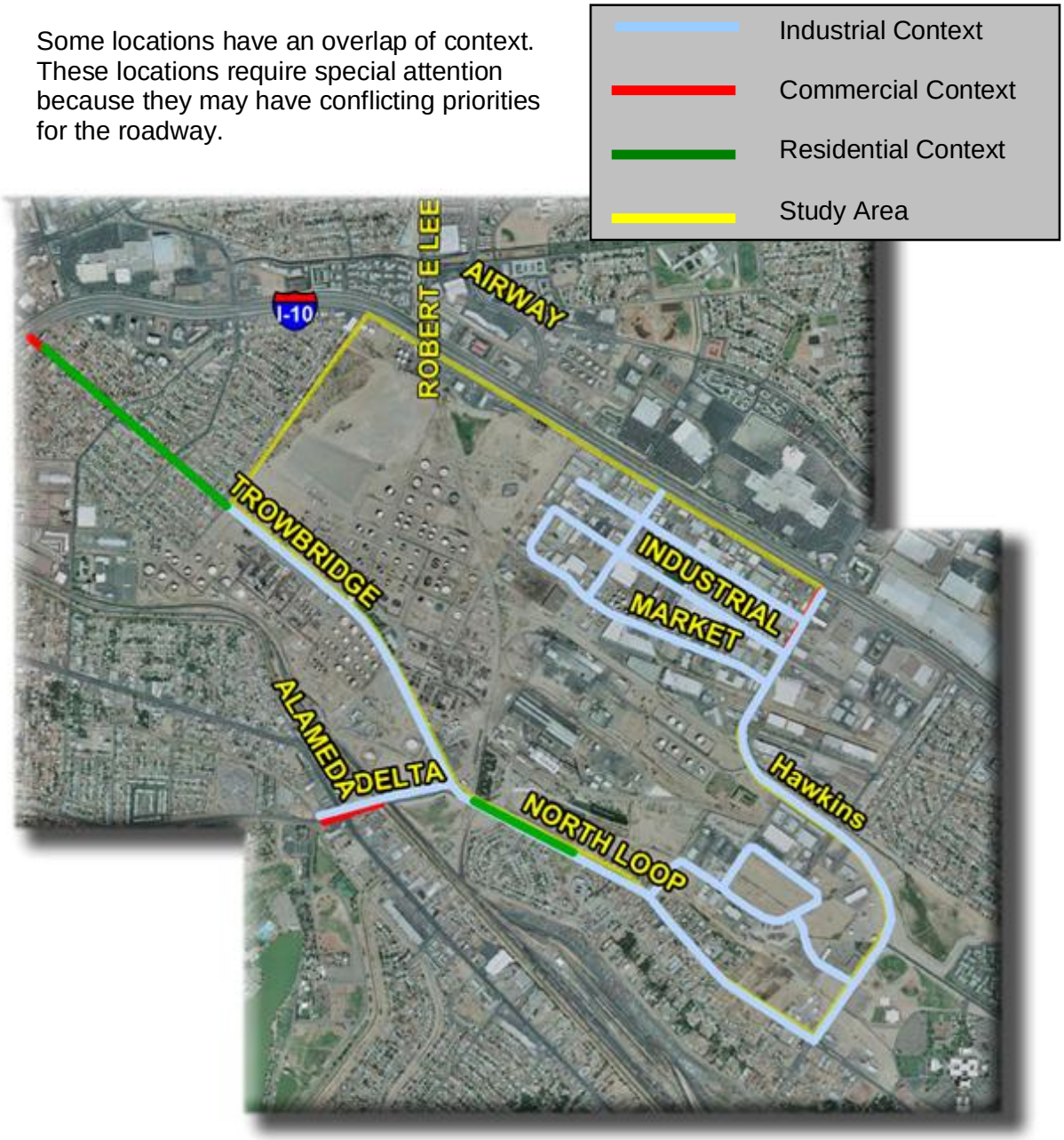


**Figure 3-4 Context Zones**

## 3.2.3 Transit Routes

Sun Metro operates five separate transit routes within the study area. All of these routes operate seven days a week from 5 AM to 10 PM.


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Routes 65 and 66 use the intersection of North Loop Drive/Delta Drive as a bus stop, prior to turning onto Delta Drive. Route 64 travels along North Loop Drive, continues through the Delta Drive intersection and moves west on Trowbridge Drive.

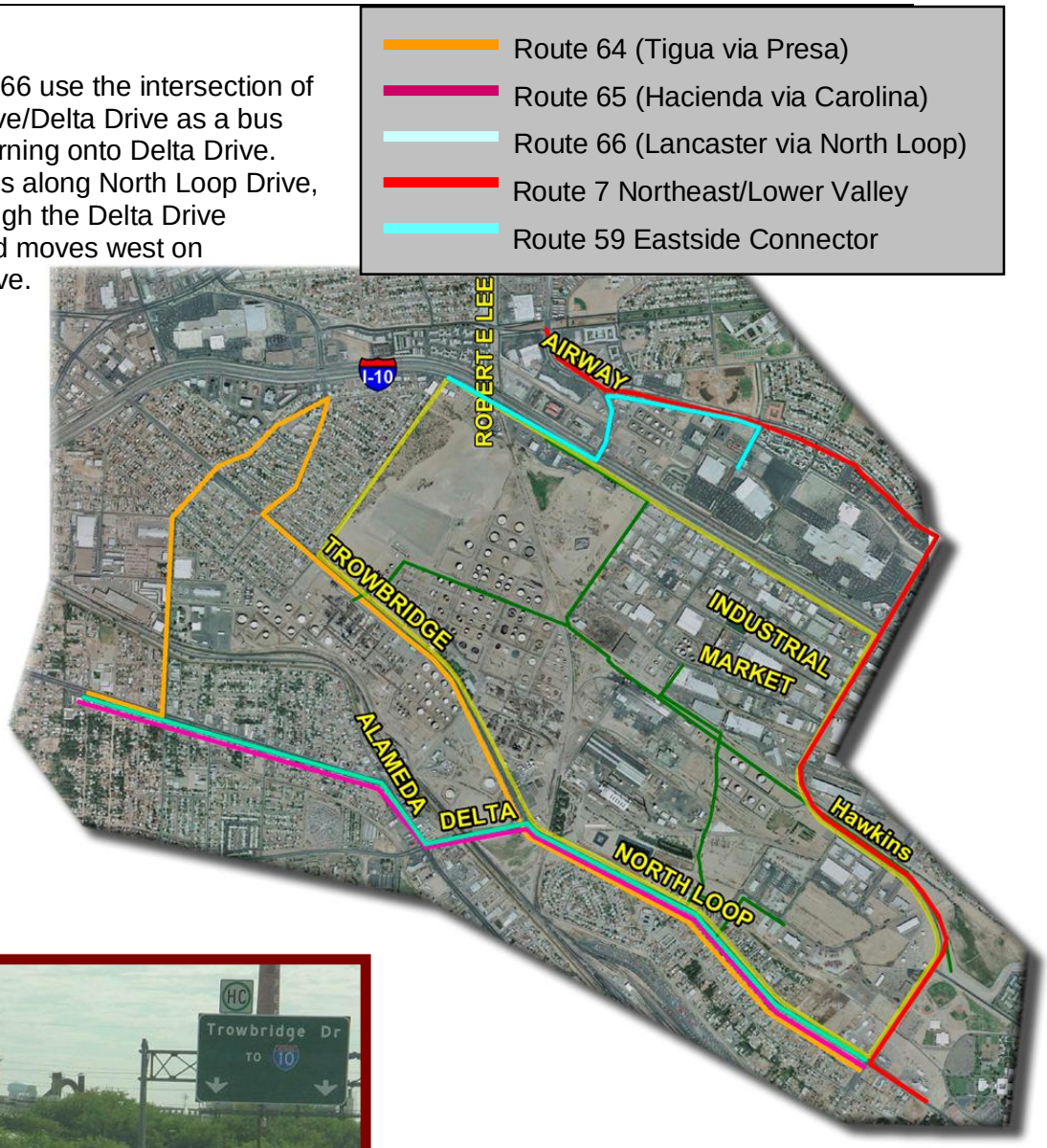

**Figure 3-5 Transit Routes**

| Route | Monthly Ridership |
|---|---|
| 7 | 22,000 |
| 59 | 36,000 |
| 64 | 2,700 |
| 65 | 12,600 |
| 66 | 16,000 |


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## 3.3 ELECTRIC UTILITIES

El Paso Electric Utilities owns and operates two separate 69kv transmission lines within the study area. The brown dots on **Figure 3-6** below represent 35-foot utility poles. There are 117 utility poles are located in the study area with and average spacing of 125 feet. There are 32 high mast steel utility poles (ASC-14), illustrated with a blue dot are present in the study area. A light blue line near the intersection of Delta Drive and North Loop Drive illustrates an underground electric line.

These transmission lines share right-of-way with the railroad and other utilities (gas, sewer, and water). The location, spacing, and general alignment of these lines will figure into the feasibility of the roadway alternatives.

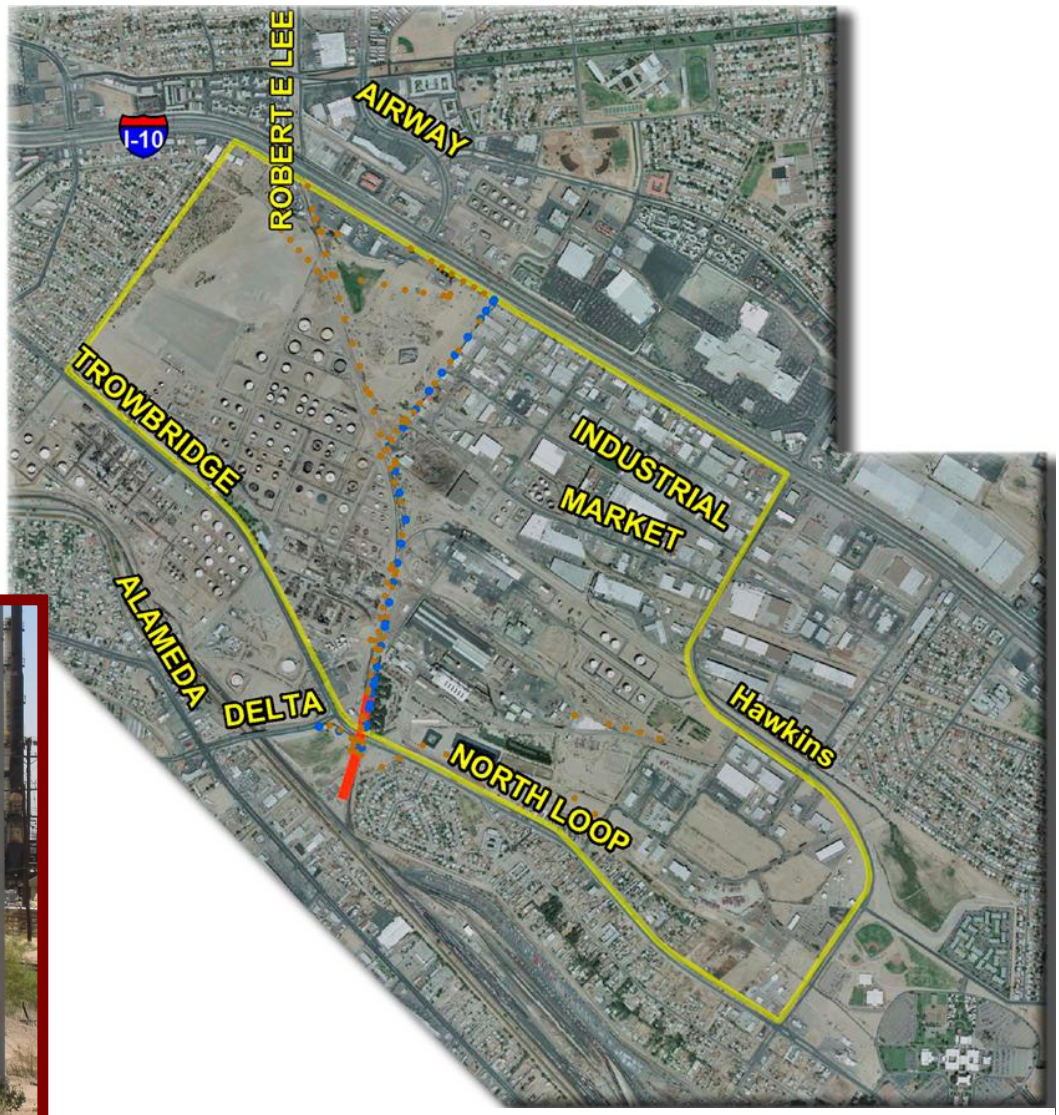

**Figure 3-6 Electric Utilities**


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## 3.4 UNDERGROUND GAS LINES

Southern Union Gas Company owns a 16-inch high pressure natural gas line which is generally aligned on the west-side of Fort Bliss Spur Railroad right-of-way. The pipeline does cross under the rail to serve clients in the industrial area. It is incased in concrete under all rail and road crossings.

Other pipelines in the area are owned by Western Refining and Phelps Dodge. These include an 8-inch jet fuel line and a distribution line.

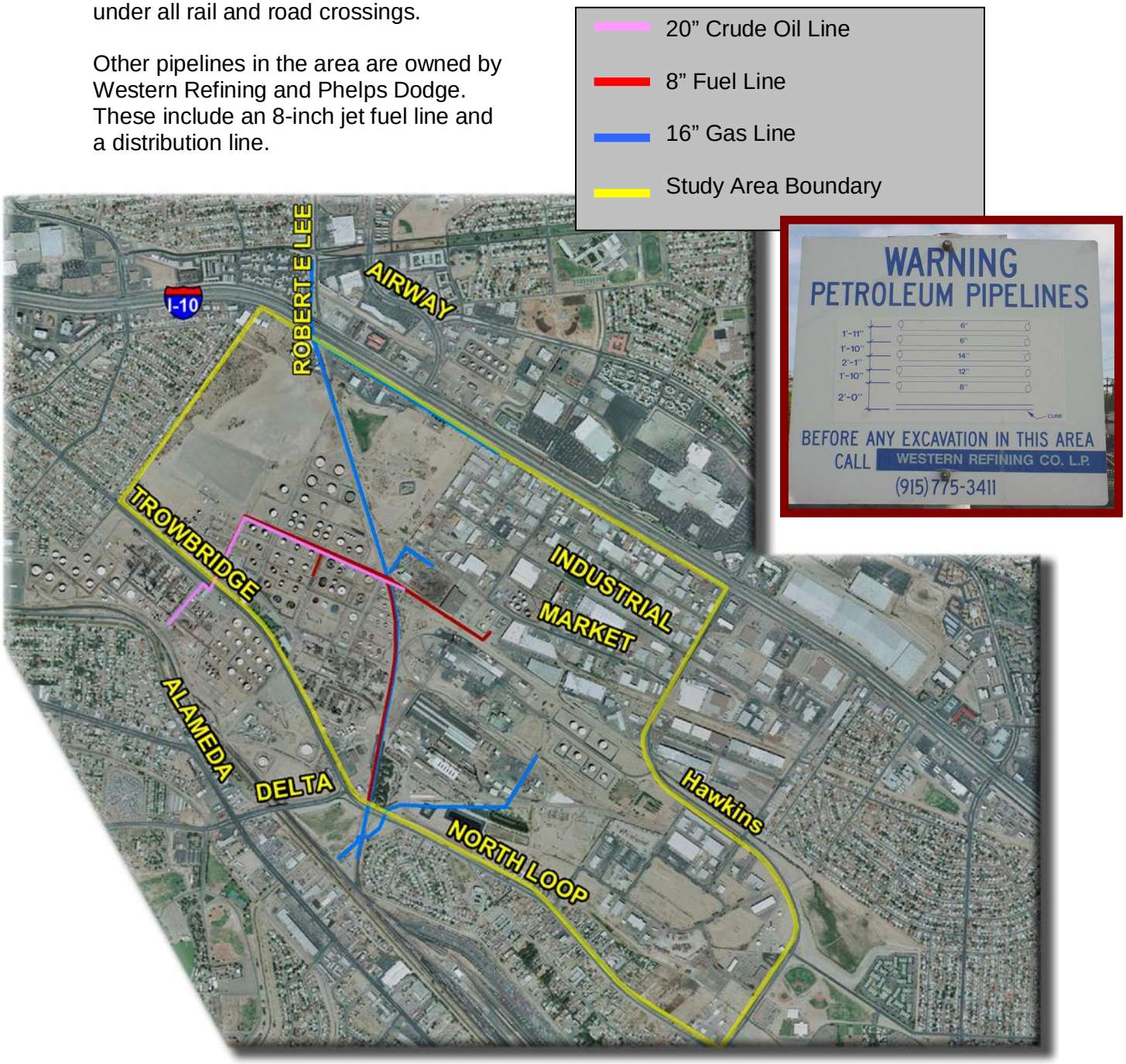


**Figure 3-7 Transmission Lines**


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## 3.5 WATER AND SEWER LINES

A 12-inch sanitary sewer lines are found in the study area and are depicted on **Figure 3-8** below with a green line. An 8-inch water line parallels the IH-10 frontage road on the north side of the study area, this is depicted using a blue line. A major 48-inch Cross City Transmission Water Main (Steel Cylinder Concrete Pipe, SCCP) traverses the refineries street frontage along Trowbridge Drive. These pipes are incased in concrete at railroad and street crossings. Mesa Drain Sanitary Sewer Interceptor lines (12-inch, 15-inch, 18-inch, 21-inch, and 24-inch) are also shown.

- Sewer Line
- Water Line
- Study Area Boundary

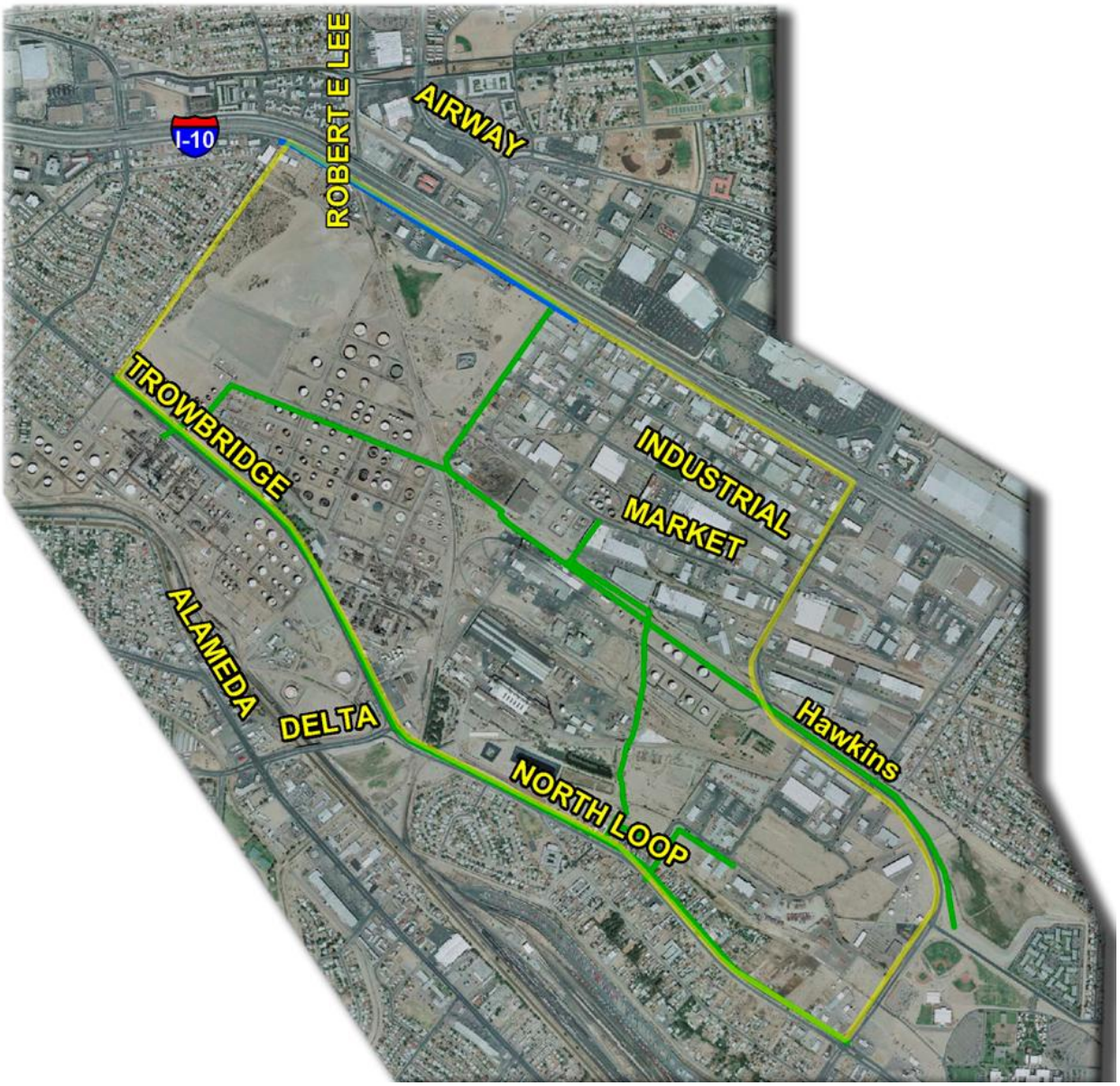


**Figure 3-8 Water and Sewer**


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## 3.6 DRAINAGE STRUCTURES

Drainage structures in the study area include detention ponds, sedimentation ponds, concrete channels, and underground pipes. The underground storm water pipes consist of a concrete encasement that contains a 3-inch steel pipe and an 8-inch a.c. pipe. **Figure 3-9** below depicts these structures using the following symbols.

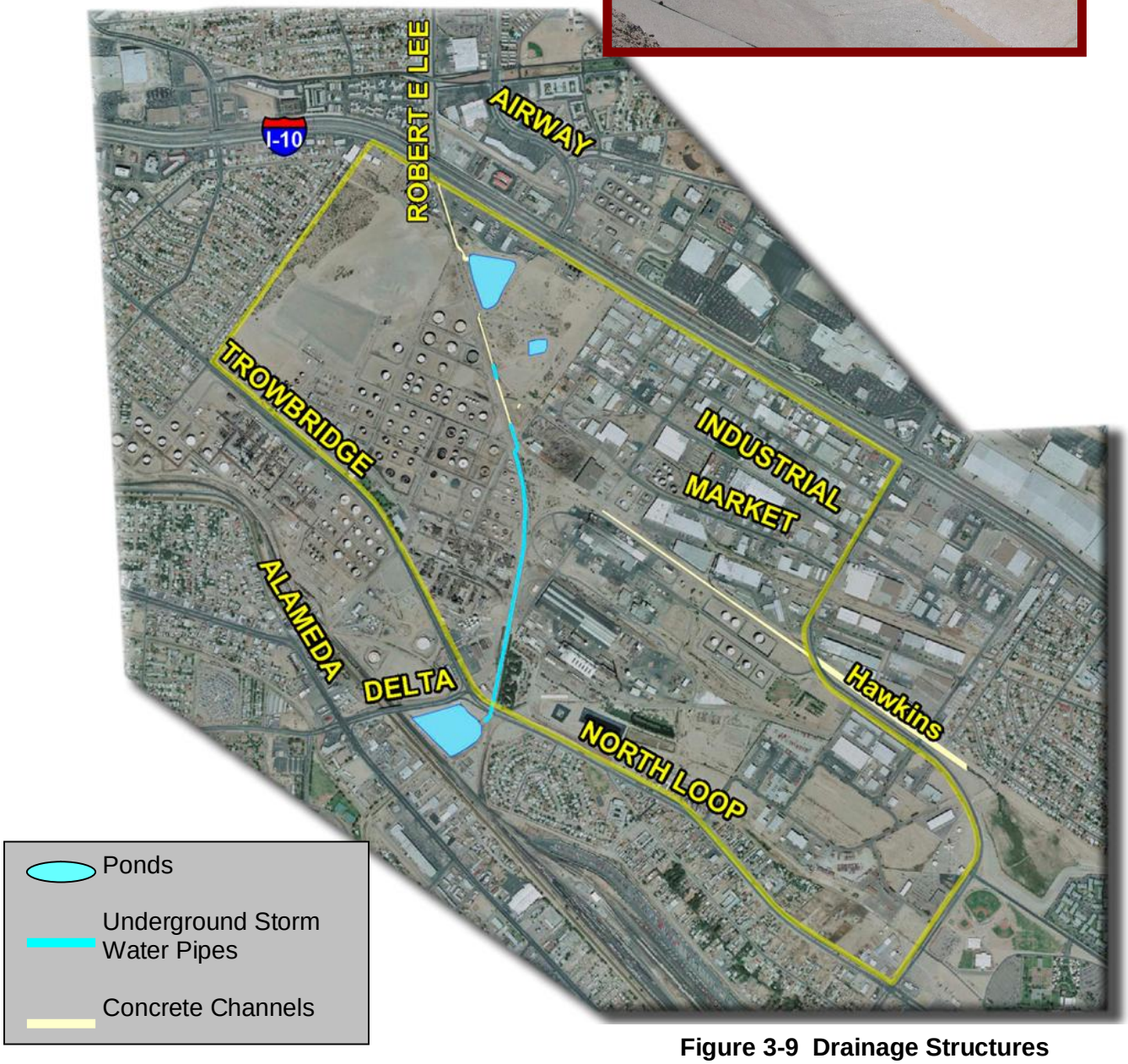


**Figure 3-9 Drainage Structures**


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## 3.7 RAILROAD LINES

Union Pacific Railroad operates approximately 1.4 miles of single track in the study corridor. This line is fed by the Union Pacific rail yard located between Alameda Avenue and North Loop Drive. From there the line travels north to Fort Bliss to deliver cargo and then returns to the rail yard.

Additionally, there is between one to two miles of local spur rail lines in various locations throughout the study area. All of tracks are depicted in **Figure 3-10** below with a black line.

Railroad

Study Area

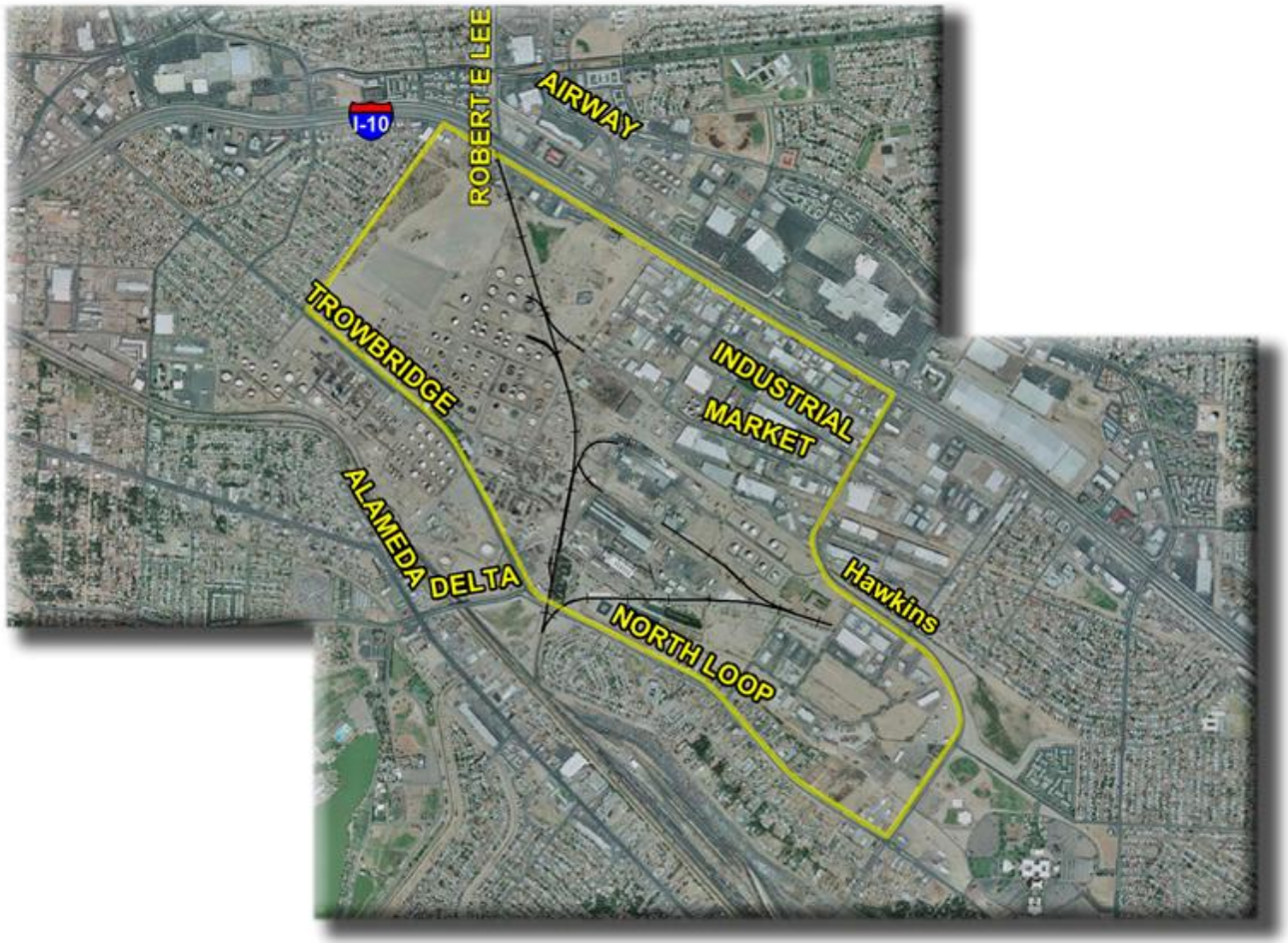


**Figure 3-10 Railroads**


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## 3.8 ENVIRONMENTAL BACKGROUND

This feasibility study was prepared in order to identify potential constraints to future project development and evaluate potential routes. It is not intended to satisfy the requirements of NEPA, or other applicable laws and regulations. It recommends additional regulatory considerations and tasks for the compliance phase and should assist with the narrowing of alternatives to be examined fully in an Environmental Assessment (EA).

### 3.8.1 Land Use

In general, land uses in the project area are primarily industrial, dominated by Western Refinery west of the Union Pacific Railroad (UPRR) and by Phelps Dodge east of the UPRR. See **Figure 3-11.**

**Figure 3-11 Industrial Land Use in Project Area**

Smaller scale industrial/commercial businesses are located in the "East Side Industrial" or northeast portion of the study area. Many utilities traverse this industrial area. Residential areas are located to the west of the study area (bounded by IH-10, Marlow Road, Tampa Road, and Frederick Road), and south of the project area (one area is bounded by North Loop Drive, Hawkins Boulevard, and the Alfalfa Yard/UPRR; another area is bounded by El Paso Road, Pendell, Alameda Avenue, and UPRR). Commercial land uses are predominant north of IH-10, south of the Franklin Canal, and north of North Loop Drive. The primary land uses traversed by each of the alternatives are described below. No public recreational resources (Section 4(f)/6f properties) are located in the immediate study area. See also *Hazardous Materials* information (not included in the land use discussion), and *Historic* and *Archeological Resources* information, below.


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**Figure 3-12 Union Pacific Railroad, Utilities, and Concrete Drainage at Robert E. Lee**


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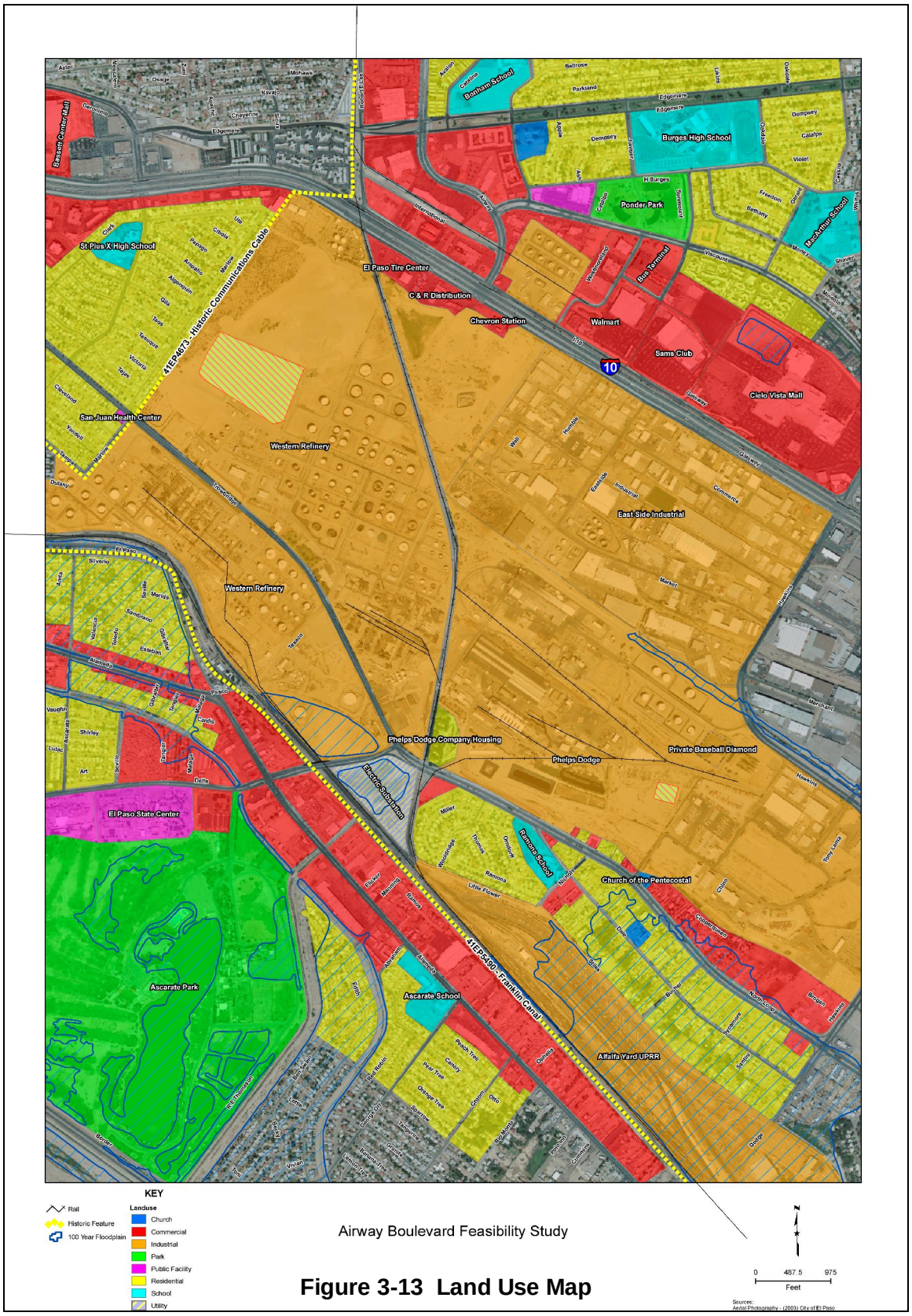


**Figure 3-13 Land Use Map**


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**Figure 3-14 Church of the Pentecostal**

### 3.8.2 Socioeconomics

The project area is located in U.S. Census Tract 35.01, Block Group 1. Residential areas are concentrated along North Loop Drive in the mixed commercial/residential area and in the Phelps Dodge Housing area on the industrial property. See **Figure 3-15, 2000 Census Geography.** Of the 412 persons residing in the block group in 2000, 373 persons (90.5%) were Hispanic (with Hispanic ethnicity isolated from other race categories); 36 persons (8.7%) were Caucasian; 3 persons (0.7%) were two or more races; and zero persons were Black or African American, American Indian/Alaska Native, Asian, Native Hawaiian/Other Pacific Islander, or some other race. This is higher than the 76.6% of persons in the City of El Paso who were Hispanic. Approximately 21.3% (91 of 427 persons) are living below poverty, which is very close to El Paso's 22% in poverty. Of the 135 homes, 91% were owner-occupied in Tract 35.01 BG 1, whereas 61.4% of homes were owner-occupied in El Paso. The Median Household Income in 2000 was $24,625 in Tract 35.01 BG 1, exceeding the 2005 poverty guideline for a family of four of $19,350 (U.S. Department of Health and Human Services, http://www.cppp.org/files/8/poverty101.pdf). The City of El Paso's median household income was higher at $32,124 in 2000.


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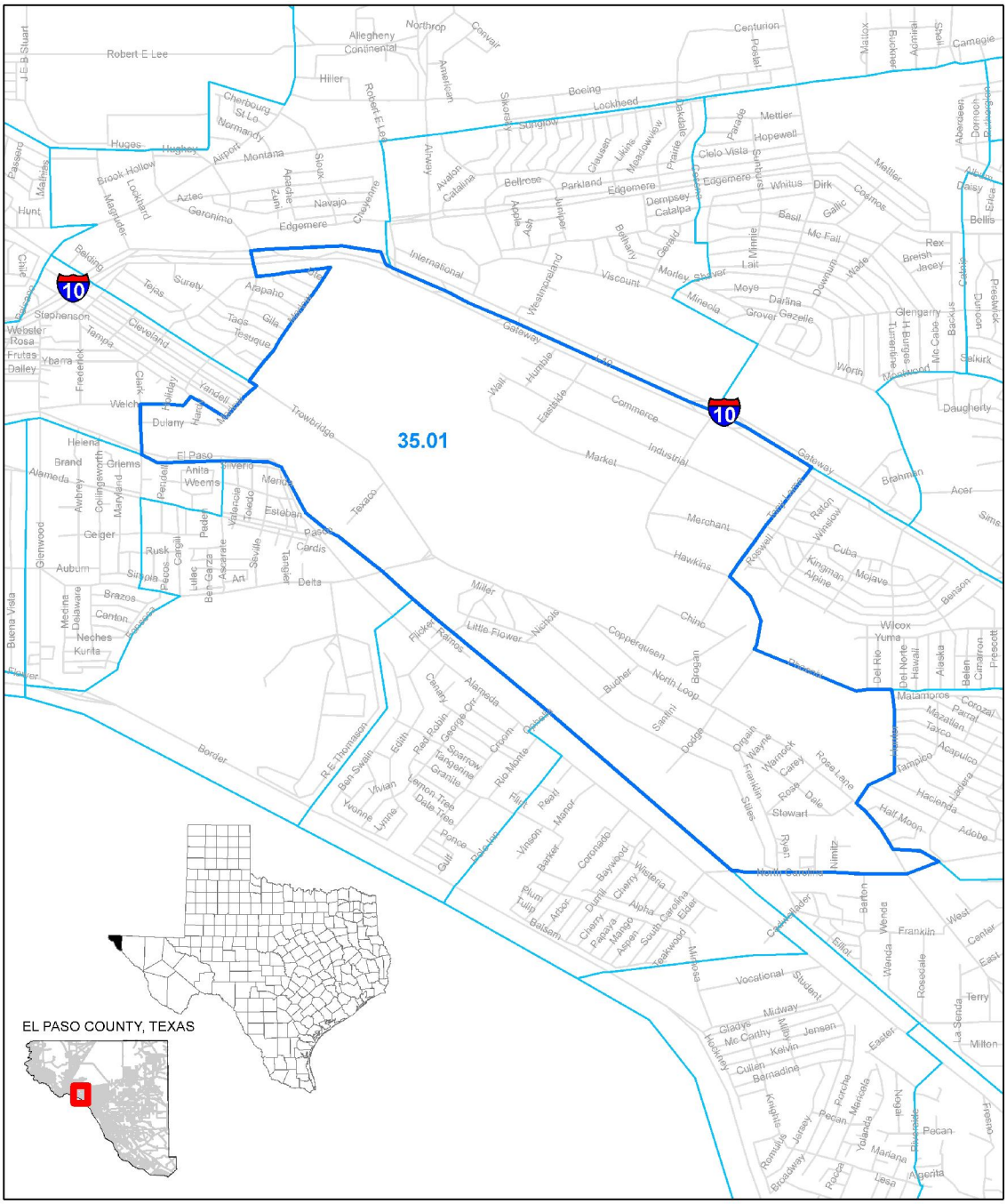


2000 Census Geography

KEY

Census Tract 35.01

1 Inch Equals 3000 Feet

**Figure 3-15 2000 Census Geography**


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Because some residential areas have a higher percentage of Hispanic persons and the same percentage of persons in poverty, a more detailed environmental justice analysis would be required for alternatives resulting in relocations. Relocations would not necessarily result in disproportionate adverse effects on minority or low-income communities, but the most effective form of mitigation for potential environmental justice concerns is avoidance. From an environmental justice perspective, any alternative that avoids impacts to residences would be favorable. Alternatives requiring relocations would necessitate a detailed environmental justice assessment under Title VI of the Civil Rights Act of 1964 and Executive Order 12898 on Environmental Justice in addition to compliance with Title VIII of the Civil Rights Act of 1968 and the Housing and Urban Development Amendment Act of 1974.

## 3.8.3 Community Issues

### 3.8.3.1 Plan Compatibility

According to *The Plan for El Paso* (Comprehensive Plan for El Paso, 1999), the actual project area falls into multiple planning areas covered in the comprehensive plan: the area west of the UP railroad is in the central planning area and the area east of the UP railroad is in the Lower Valley planning area. The Airway Boulevard project area is generally designated as residential land use south of IH-10 and west of the UP railroad, and industrial east of the UP railroad. Although some of the area west of Marlow Road is residential, it is unlikely that a conversion of the property west of UP railroad line to residential would occur — it is most likely to remain industrial, in part due to the location of a landfill in that general area. The comprehensive plan also shows existing bikeways along North Loop Drive, proposed bikeways along Trowbridge Drive, and recommended bikeways along the UP railroad line to connect with recommended lines along the border highway.

### 3.8.3.2 Community Cohesion

Because the project area is primarily industrial, very few of the alternatives presented would have the effect of dividing existing neighborhoods or severing community cohesion. For alternatives following the existing railroad line, a roadway would be a different type of physical facility separating the two industrial portions of the project area, but would have a similar effect to the existing condition represented by the railroad. If a roadway were constructed, it is possible that this would stimulate some degree of secondary development such as commercial/retail/industrial businesses nearby which would have positive economic effects on the area.

## 3.8.4 Cultural Resources

### 3.8.4.1 Historic Resources

Under Section 106 of the National Historic Preservation Act (NHPA), federal law requires that projects receiving federal funding take into account any effects upon


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historic properties and coordinate with the State Historic Preservation Officer (SHPO) (36 CFR Part 800). In addition, NEPA requires that agencies consider the impacts of their projects on the natural and human environment, which includes cultural resources. The NHPA defines historic properties as any building, structure, object, site, or district listed in or eligible for listing in the National Register of Historic Places (NRHP). Thus, constraints that should be considered for the proposed project include those properties that may be eligible for listing in the NRHP. NRHP listed properties may be Section 4(f) resources and if potentially impacted, would need to be investigated during the compliance phase.

During future environmental compliance phases, for compliance with Section 106, architectural historians would first need to establish an area of potential effect (APE) for any proposed alignments. Setting the boundaries of the APE would require consultation with the Environmental Affairs Division of TxDOT (ENV), but the standard under the Programmatic Agreement is a buffer of 300 feet from the proposed right-of-way for new construction, and 150 feet for improvements to existing roadway. A broader study area may be required by ENV to ensure that larger resources, such as districts, are taken into account. Once an appropriate study area is established, a reconnaissance-level survey would identify any historic-age properties that may be impacted in the APE. Architectural historians would then evaluate the surveyed resources for NRHP eligibility, and determine impacts to any eligible historic properties. The findings would be presented in a Historic Resources Survey Report, to be coordinated with the Texas SHPO — the Texas Historical Commission (THC) — through ENV.

El Paso has a rich and long history, but the majority of previously identified NRHP properties are northwest of the project area, closer to downtown. Two historic properties that have been recorded as archeological historic sites are within the boundaries of the project area: a buried communications cable and an irrigation district (see *Archeological Resources* below for additional information on the communications cable). The project area is dominated by long-standing industrial complexes, a resource type that may be significant in the history of El Paso, and thus will need to be evaluated for NRHP eligibility in order to determine project impacts. Project architectural historians have identified several locations that would require a reconnaissance level survey in the compliance phase in order to determine NRHP eligibility.

The Phelps-Dodge complex has identifiable historic-age (approximately 50 years of age or older) buildings and structures that may either be eligible on their own merit or contribute to the eligibility of a historic district. This includes the old Nichols Copper Company brick smokestack (**Figure 3-16**), industrial components of the Phelps-Dodge operation (**Figure 3-17**), and the small residential neighborhood at the intersection of Trowbridge Drive and the UPRR line (**Figure 3-18**). The brick smokestack is a remnant of the original copper refinery in the City established by Dr. W. H. Nichols and now owned by Phelps-Dodge, itself a company with a long history in El Paso. The residential neighborhood is a collection of 1930's Spanish eclectic houses likely built as company housing for Phelps-Dodge employees. The well-maintained houses share a communal


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garage and are surrounded by lush landscaping. A 1940's mixed-use neighborhood on North Loop Drive immediately south of Phelps-Dodge would also require survey. These properties may need to be evaluated for NRHP eligibility.

The Western Refining Company complex contains historic-age structures that would need to be evaluated for NRHP eligibility in order to determine the impacts. A 1950's residential neighborhood off Trowbridge Drive would need to be evaluated for NRHP eligibility in order to determine the impacts.

Finally, the Franklin Canal (**Figure 3-19**), part of the NRHP-listed El Paso County Water Improvement District No. 1 listed in 1997, runs east-west along the southern border of the project area. The historic district itself includes the southern third of the project area. Impacts to the canal or other contributing features should be avoided; any adverse effects to the canal or other contributing resources would require mitigation in consultation with the THC.

**Figure 3-16 Nichols Copper Company Brick Smokestack**


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**Figure 3-17 Industrial Components of Phelps-Dodge Operation**

**Figure 3-18 Phelps-Dodge Company Housing Area**


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**Figure 3-19 Franklin Canal**

### 3.8.4.2 Archeological Resources

A search for previously recorded archeological resources was conducted by consulting the Texas Historical Commission's Online Sites Atlas. According to available data, there is one National Register of Historic Places (NRHP) Site (41EP4673), one National Register of Historic Places District (the El Paso County Water Improvement District No. 1), and one potentially NRHP-eligible historic site (41EP5490) within 500 feet.

The AT&T Communication Cable site is, as the name implies, a buried historic telephone line that dates to 1947-1948. Through the proposed project area, the line is buried adjacent to Marlow Road between Tampa Boulevard and IH-10, however, the line (and thus the site boundary) extends to the northeast and southwest, well outside the project area. Site surveyors indicated that the site boundaries are clearly denoted by utility (telephone and fiber optic line) easement markers. Beyond the cable itself, there are no artifacts or features associated with the Communication Cable site that could be impacted through roadway construction. Site recorders stated that Site 41EP5490 has potential to be listed on the NRHP or as a State Archeological Landmark (SAL), however, they further recommended that no further work was necessary for site documentation.


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Other potential archeological site impacts are not clearly denoted, however, the study area does extend through the El Paso County Water Improvement District No. 1 (EPCWID), a NRHP District. Included in the EPCWID is the Franklin Canal (Site 41EP4673), a National Register Listed Site in its own right. This canal would not likely be impacted by construction activity. Given that these features are part of the historic built environment of the project area, they are discussed more thoroughly in the *Historic Resources* section (along with regulatory recommendations) above.

Considering the built, industrial environment, there is very little likelihood that intact archeological features or sites will be impacted by the proposed project. The area has been thoroughly impacted by modern industrial activity and any archeological sites that may have been found have invariably been destroyed through modern activity. Avoidance of Site 41EP5490 is recommended. If the site would be impacted by any alternative assessed in the compliance phase, further archival or archeological survey work in accordance with Section 106 of the National Historic Preservation Act and the Texas Antiquities Code may be necessary.

## 3.8.5 Water Resources

### 3.8.5.1 Surface Water

El Paso is located in the Rio Grande Basin, which originates in southern Colorado, flows southerly across New Mexico, and enters Texas about 20 miles northwest of El Paso. It forms the international boundary between the U.S. and Mexico from El Paso to the Gulf of Mexico. Elevation of the streambed at the Texas-New Mexico state line is approximately 3,800 feet. The total basin drainage area is 182,215 square miles, of which 88,968 square miles are in the U.S. and 48,259 square miles are in Texas. The Pecos and Devils Rivers are the principal tributaries of the Rio Grande River in Texas.

For monitoring purposes, the basin has been divided into 14 segments consisting of three major reservoirs (with a surface area of 163,776 acres) and 1,551 stream miles (TDWR, 1984). The segment adjacent to the project area is designated by the Texas Commission on Environmental Quality (TCEQ) as Segment 2308. Segment 2308 extends 15 miles from the Riverside Diversion Dam in El Paso County to the International Dam in El Paso County.

According to the TCEQ 2002 Water Quality Inventory, the fully supported uses of Segment 2308 include aquatic life, noncontact recreation, and general uses. Fish consumption and public water supply uses were not assessed. Although aquatic life uses were fully supported overall, there was a use concern established for chronic toxicity in sediment. Nutrient enrichment concerns existed for ammonia based on a high number of criteria exceedances. In addition, some exceedances were recorded for orthophosphorus and total phosphorus resulting in an overall concern established for nutrient enrichment for the entire segment.


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Although the Franklin Canal, a manmade drainage structure in the project area, drains into Segment 2308 of the Rio Grande, none of the alternative groups are expected to impact Segment 2308 directly.

### 3.8.5.2 Floodplains

Floodplains occurring in the vicinity of the proposed project area were identified using Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for the City of El Paso and El Paso County (FEMA Panel Numbers 4802140041B). Although levees along the Rio Grande have reduced the likelihood of catastrophic flood events in the river valley, localized flooding can occur as a result of intense thunderstorms that frequently occur in the summer. These “flash floods” can send large volumes of water through usually dry arroyos and waterways in a very short time period.

Impacts to floodplains associated with a concrete drainage to the Phelps Dodge Detention Basin east of the project area along Hawkins Boulevard (**Figure 3-20)** could occur. Any alternative constructed would be required to convey the 100-year flood.

**Figure 3-20 Concrete Drainage Structure Along Hawkins Boulevard**


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#### 3.8.5.3 Groundwater

The Hueco-Mesilla Bolson aquifer consists of two components. The Hueco Bolson is located in Hudspeth and El Paso Counties, a small part of the Mesilla Bolson extends into El Paso County. The Hueco-Mesilla Bolson aquifer is located east of the Franklin Mountains. The Mesilla Bolson occurs to the west. In 1997, 95,633 acre-feet of groundwater were pumped from the aquifer principally for municipal supply, a high-pumping level of 138,203 acre-feet was met in 1989. The Hueco Bolson, approximately 9,000 feet thick, is comprised of silt, sand, and gravel in the upper part and clay and silt in the lower part. Fresh to slightly saline water is found only in the upper several hundred feet. The Mesilla Bolson is comprised of 2,000 feet of clay, silt, sand, and gravel. Water quality varies according to depth. The quality in the Hueco Bolson is best in the upper parts; in the Mesilla Bolson it is best in the deeper parts (TWDB, 2001).

Major water level declines have resulted from large-scale groundwater withdrawals. The City of El Paso has put into action an aggressive regional water resource management plan (TWDB, 1997).

#### 3.8.5.4 Section 404 Jurisdictional Waters

Impacts to wetlands and other waters of the U.S. are regulated under Section 404 of the Clean Water Act, as administered by the U.S. Army Corps of Engineers. Corps regulatory authority under Section 404 extends to the ordinary high water mark of waters of the U.S., which are defined as (1) all waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide; (2) all interstate waters including interstate wetlands; (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce. Based on the above definition, a dry arroyo (ephemeral or intermittent stream) may be subject to the same permitting requirement as a wetland.

Background research of historical U.S. Geological Survey topographical maps, National Wetland Inventory maps, and historic and current aerials was completed to identify any water features in the project area (wetlands, ponds, intermittent streams, and other waterways). During the field investigation in April 2005, areas with mapped water features were photographed where possible and any signs of hydrology and connectivity to other waters were noted (**Figures 3-19 and 3-20**). It appears that the water features in the study area are man-made drainages or irrigation canals through upland areas. Based on the historical quads, it does not appear that these features are modified natural drainages, thus, they would not fall under USACE jurisdiction. Based on these limited investigations, it appears that there are no jurisdictional waters or wetlands in the project area. However, it is recommended that impacts to water features be reassessed during the compliance phase to confirm that no regulatory coordination under Section 404 is required.


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## 3.8.6 Ecological Resources

### 3.8.6.1 Vegetation

The study area occurs in a heavily developed section of El Paso, consequently, no important natural vegetational communities are found in the area. Typical vegetation in the study area includes various ornamental or horticultural species planted along residential streets and in private parks (on industrial properties), and weedy species such as screwbean (*Prosopis pubescens*), Asiatic elm (*Ulmus pumila*), retama (*Parkinsonia* aculeata), and various common grasses and forbs.

### 3.8.6.2 Wildlife

Because the study area occurs in a heavily developed section of El Paso, no high quality wildlife habitats are found. Common bird species typical of human development, including the common grackle, house sparrow, and mourning dove can be found within the study area. It is anticipated that these species would move from the area during construction.

### 3.8.6.3 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) has legislative authority to list and monitor the status of species whose populations are considered to be imperiled. This federal legislative authority for the protection of threatened and endangered species issues from the Endangered Species Act of 1973 and its subsequent amendments. Species listed as Endangered (E) or Threatened (T) by the USFWS are provided full protection, which includes a prohibition of indirect take such as destruction of critical habitat. The Endangered Species Act and accompanying regulations provide the necessary authority and incentive for the individual states to establish their own regulatory guidelines for the management and protection of threatened and endangered species. The Texas Parks and Wildlife Department (TPWD) has regulatory authority over state threatened and endangered species listings and the taking, possession, transportation, exportation, processing, sale, and shipping of these species.

Federally listed threatened and endangered species potentially occurring in El Paso County include three endangered bird species, one threatened bird species, one candidate bird species, and one endangered plant species. State-listed threatened and endangered species potentially occurring in El Paso County include three endangered and four threatened bird species, one endangered and one threatened fish species, two endangered and one threatened mammal species, four threatened reptile species, and one endangered plant species. See **Appendix A** for USFWS and TPWD County Lists.

During the April 2005 field investigation of the study area, no endangered, threatened, otherwise sensitive species, or suitable habitat for these species


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were observed. Due to the lack of suitable habitat and because the study area occurs in a heavily developed part of the City of El Paso, no impacts to protected species are anticipated from any of the proposed alternatives.

### 3.8.7 Traffic Noise

The study corridor is typical of developed urban and industrial locations. Noise is generated by traffic on major arterial roadways, IH-10, local streets, and other non-transportation sources. Within the study corridor, infrequent contributions of noise can be expected from other transportation modes such as rail. The Federal Highway Administration (FHWA) provides noise criteria and guidance at 23 CFR 772 *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. FHWA policy and guidance are implemented within TxDOT in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Highway Traffic Noise*. FHWA and TxDOT noise regulations are applicable to this project because of the proposed increase in the number of through-traffic lanes.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB." Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear, therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA." Because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "$L_{eq}$." The primary consideration in abating traffic noise impacts is given to exterior areas where frequent human activity occurs.

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Table 3-2**):


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**Table 3-2 FHWA Noise Abatement Criteria (NAC)**

| Activity Category | dBA $L_{eq}$ | Description of Land Use Activity Areas |
|---|---|---|
| A | 57 (exterior) | Lands on which serenity and quiet are of extra-ordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B | 67 (exterior) | Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals. |
| C | 72 (exterior) | Developed lands, properties, or activities not included in categories A or B above. |
| D | -- | Undeveloped lands. |
| E | 52 (interior) | Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums. |

NOTE: Primary consideration is given to exterior areas (Category A, B, or C) where frequent human activity occurs. However, interior areas (Category E) are used if these exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

The traffic noise analysis for this feasibility study will focus on a qualitative noise impact review for project alternatives. Potentially noise-sensitive residential areas are shown in **Figure 3-13** of this study. The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise
- Determination of existing noise levels
- Prediction of future noise levels
- Identification of possible noise impacts
- Consideration and evaluation of measures to reduce noise impacts

The latest version of the FHWA Traffic Noise Model (TNM) software will be used to calculate predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills, and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Traffic noise impacts occur when the predicted noise level approaches (defined as within one decibel), equal, or exceed the NAC for various land uses as shown in **Table 3-2** (Absolute Criterion) or when predicted noise levels substantially exceed existing noise levels by more than 10 decibels (Relative Criterion). When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area. Examples of noise abatement measures which may be considered in the traffic noise analysis include traffic management, alteration of horizontal and/or vertical alignments,


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acquisition of undeveloped property to act as a buffer zone, and the construction of noise barriers. In determining the feasibility, reasonableness, and cost-effectiveness for providing noise abatement, the following criteria, pursuant to TxDOT's 1997 *Guidelines for Analysis and Abatement of Highway Traffic Noise* are applied:

- In order to be "feasible," the abatement measure must be able to reduce the noise level at an impacted receiver by at least five dBA

- And to be "reasonable," it must not exceed the cost effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least five dBA

Abatement measures that are found to be reasonable and feasible are recommended for incorporation into the proposed project. The final decision to incorporate proposed abatement measures into the project will not be made until after completion of the project design and public involvement processes.

Another noise consideration within the project corridor is construction noise. Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the potential noise receivers are expected to be exposed to construction noise for a long duration, therefore, any extended disruption of normal activities is not expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

### 3.8.8 Air Quality

The 1990 Clean Air Act Amendment (CAAA) requires each region of the country to be designated as either being in attainment or nonattainment of the National Ambient Air Quality Standards (NAAQS). States with any nonattainment regions must have approved state air quality implementation plans (SIPs) which set forth measures to achieve compliance with the NAAQS. Metropolitan Planning Organizations (MPOs) are responsible for ensuring that the transportation plan and transportation improvement program (TIP) within metropolitan boundaries conform to the SIP. In metropolitan areas, each MPO must formally make a conformity determination on its Metropolitan Transportation Plan (MTP) and TIP. The CAAA requires that transportation plans, programs, and projects in nonattainment or maintenance areas that are funded or approved by the FHWA or FTA be in conformity with the SIP. A conformity determination must show that transportation plans and TIPs will not:

- Create new NAAQS violations
- Increase the frequency or severity of existing NAAQS violations
- Delay the attainment of the NAAQS

Areas within the State of Texas are designated as attainment or nonattainment with respect to the NAAQS for the following six criteria air pollutants:


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- Particulate matter no greater than 10 micrometers in diameter ($PM_{10}$)
- Sulfur dioxide ($SO_2$)
- Ozone ($O_3$)
- Nitrogen dioxide ($NO_2$)
- Carbon monoxide (CO)
- Lead (Pb)

The proposed project is located within El Paso County which is classified as a serious nonattainment area for the one-hour ozone standard. El Paso County is also designated as a moderate nonattainment area for $PM_{10}$. A portion of the City limits of El Paso is also designated as nonattainment for CO, although none of the proposed projects alternatives under consideration are located within this nonattainment zone.

As stated above, projects that are proposed in any nonattainment area must come from a conforming Metropolitan Transportation Plan (MTP) and TIP. Therefore, any project resulting from this study must be included in a transportation plan and TIP that has been determined to be in conformance with the ozone SIP for El Paso County. Also, any project resulting from this study is subject to $PM_{10}$ project level conformity. Additionally, El Paso is designated as a Transportation Management Area (TMA). Since the proposed project is located within a TMA which is designated as nonattainment for ozone and $PM_{10}$, the requirements of 23 CFR 450 apply. This means that any expansion projects that might be recommended as a result of this feasibility study must come from an operational Congestion Management System (CMS) which meets the requirements of 23 CFR 500. Any expansion projects must also be vetted through the metropolitan planning process and included in the latest El Paso Metropolitan Planning Organization transportation plan/TIP.

The State of Texas requires that a Traffic Air Quality Analysis (TAQA) be completed for project types as shown below. The TAQA requirement is the same for nonattainment as well as attainment areas and is not dependent on federal funding.

- Projects with added capacity on roadways with more than 20,000 average annual daily traffic (AADT)
- Projects requiring an Environmental Impact Statement

The primary pollutants from motor vehicles are volatile organic compounds (VOCs), carbon monoxide (CO), and nitrogen oxides (NOx). Volatile organic compounds and nitrogen oxides can combine under the right conditions in a series of photochemical reactions to form ozone (O3). Because these reactions take place over a period of several hours, maximum concentrations of ozone are often found far downwind of the precursor sources. Thus, ozone is a regional problem and not a localized condition.

The modeling procedures for ozone require long term meteorological data and detailed area wide emission rates for all potential sources (industry, business, and transportation) and are normally too complex to be performed within the scope of an environmental analysis for a highway project. Accordingly, concentrations of ozone for the purpose of comparing the results of the NAAQS are modeled by the regional air quality planning agency for the SIP. However, concentrations for carbon monoxide are readily modeled for highway projects and are required by federal regulations. Therefore, a detailed


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CO project level modeling analysis should be included in the environmental compliance document once a preferred alternative has been identified.

## 3.8.9 HazMat

Potential contaminations of soils and groundwater within the alternatives roadway alignments were evaluated. This evaluation was performed as a desktop study reviewing known data sources, databases recording incidents of known contamination of storage of hazardous materials. Databases were searched based upon spatial coincidence to the project area. The database examination was performed by Environmental Data Resources, Inc. Roadway alternatives were assessed for potential coincidence of the physical address for potential hazardous cites as cited in the EDR Report.

### 3.8.9.1 Potentially Contaminated Sites and Regulated Substances

A list of potentially contaminated sites was compiled based upon land use histories and knowledge of sites containing regulated substances. These sites were ranked according to a Delphi Ranking System set by Kimley-Horn.
A Delphi System is one created by expert assignment through iterations of a selected team. The ranking system developed herein is designed to provide a collective basis by which to estimate relative, better or worse, potentials of risk for the sites based up data and information discovered through records searches. This system is purely a ranked system and cannot properly be used in any ratio, categorical, or algebraic manner.

To assign comparative levels to potential effects of alternative roadway alignments, documented sites within the immediate proximity of alternative alignments are counted toward a higher potential for encountering contamination during construction. These alignments would require additional considerations (onsite investigations, further history searches, onsite sampling, etc.) before acquisition. This assignment is based upon the potential of contamination, as indicated from records searches, not from the de facto knowledge of actual contamination. The ranking system is set as going from one to five. There is no cardinal or algebraic association of the numbers, one is not five times number five, nor do five one rankings equal a site being given a five ranking.

The rankings are to allow for a general attribution of potential consequences based upon differing site conditions relative to any potential contamination(s). The effects of contamination would include the necessity of considerations of extended costs for potential remediation inclusive of sampling and lab analyses, costs of relocating contaminated materials including soils, costs of additional permitting, and oversight. A search of standardly available state and federal environmental records was performed and delivered by Environmental Data Resources, Inc. (EDR). EDR conducted a search of specified state and federal databases for regulated sites within specified distances from the study site (please see **Appendix B**). The environmental database search was designed to meet the requisite requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. The database search yielded approximately 382 records of regulated sites within the search radius. Though some databases contained duplicate information, they were searched to further minimize any


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potentials of oversight of any known location of concern. This does not imply that all sites were discovered through this search. There is the possibility that regulated sites escaped detection due to limitations of the database search, the incompleteness or inaccuracy of the database records or the presence of undetected or unreported environmental issues.

#### 3.8.9.2 EDR Record Ranking Criteria:

Upon review, each record was given a numerical ranking of one to five based upon the following criteria:

1. Site with reported releases and/or contamination (LUST Sites, CERCLIS, etc.).
2. Regulated facilities with violations (RCRA Violators etc.).
3. Regulated facilities with no reported violations.
4. Closed facilities. Note closed facilities can be sources of contamination both as a consequence of contamination when active and/or due to a lack of on going maintenance of historic storage systems resulting in contamination.
5. Insufficient information to make a determination.

This task consisted exclusively of a review of the records generated in the EDR Report. No attempt was made to verify the individual records or acquire additional information regarding the corresponding site. Each record (or site) was evaluated based upon the potential for the presence of soil and/or ground water contamination.

All estimates, descriptive ratings, or risk codes provided in this report are for a relative ranking assessment only, and are not intended to provide direct conclusions regarding any specific environmental risk by site location or relative to a roadway alignment. If the presence of contamination is likely, based upon inferences made from EDR documentation, then additional investigation of these sites is warranted. The additional investigation would be required to confirm the specific presence and nature of any contamination, any contaminants actual proximity to the proposed roadway or right-of-way, as well as any potential impacts the roadway might have on increasing release and/or mobility of any contaminants present. The additional investigations should include, but are not limited to:

- Comprehensive review of state and regulatory files pertaining to the sites
- Discussions or interviews with the corresponding property owners or responsible parties
- Soils testing
- Ground water sampling
- Modeling

In the cases of documented contamination, then appropriate soils and/or groundwater management plans would need to be developed for activities within these areas.

Further ground-based investigation may also be necessary to confirm the presence and the extent of contamination within the proposed right-of-way.


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Any contamination would require supplemental actions to determine specifics of contamination, handling requirements, and remediation activities that would address the contamination within and along the project limits.

### 3.8.10 Summary

For all resource categories, compliance level investigations of engineering designs would be required under the National Environmental Policy Act and the other pertinent regulations described herein assuming a federal funding component.

Although direct impacts may not ultimately occur to the NRHP-listed Franklin Canal due to the proposed bridge structure, additional investigations would be needed to determine temporary impacts and to ensure permit compliance with Section 404 (USACE) and the Texas Antiquities Code (THC). In general, ecological and archeological constraints are relatively minor for all alternatives.


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# 4.0 PUBLIC INVOLVEMENT PROCESS

Public involvement was a significant portion of the feasibility study. A proactive public involvement program provides opportunities for the general public, business owners, and various interest groups to participate in the overall process. The public involvement process for this study included four Stakeholder Committee Meetings and two Public Meetings. The Stakeholder Committee consisted of representatives of businesses affected by the project and public officials. The stakeholders' role was to provide local support and assistance in determining the feasibility of each alternative. By participating in the planning process, local community leaders were able to distribute accurate information about the study. The Stakeholder Committee was vital in providing the Study Team with insight into the mobility and safety needs of the area. Public Meetings were used by the Study Team and Stakeholder Committee in presenting analysis and the most recent decisions to the general public. During these meetings, the public was able to identify issues and express concerns of the study process and potential solutions.

In addition to meetings for stakeholders and the general public, newsletters, and a project website were used in order to disseminate information. Two newsletters were distributed throughout the life of the project in order to inform residents of project progress as well as upcoming meetings. Additionally, the City of El Paso website provided a link to the Airway Boulevard Feasibility Study website. This website provided accessible information to the public about the projects such as project goals, presentation materials, study findings, and meeting notes.

## 4.1 STAKEHOLDER MEETING

Four Stakeholder Committee Meetings were conducted during the study process in order to provide local officials and major stakeholders the opportunity to direct the decision-making process. Each of the meetings was conducted at key points within the process. The first Stakeholder Meeting occurred in the early stages of the project and allowed the Study Team to present the proposed schedule and methodology used for evaluation. In addition, the Stakeholder Committee began to discuss potential issues within the study area. The additional Stakeholder Committee Meetings took place at project milestones. The second Stakeholder Meeting took place at the conclusion of the development of the conceptual alternatives phase while the third meeting will present the analysis of each of the alternatives. The Study Team will present the final report findings in the fourth Stakeholder Meeting.

The Stakeholder Committee was comprised of State and local officials, business representatives, and other entities that could be significantly impacted by the study. Involving key decision makers in this process was vital in order to allow the project to move forward without delay. The following sections provide a summary of each of the Stakeholder Committee Meetings held for the Airway Boulevard Feasibility Study.


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### 4.1.1 Stakeholder Meeting #1

Stakeholder Committee Meeting #1 was held at the El Paso City Hall on **February 17, 2005 at 10:30 AM.** The meeting purpose was to explain the study process, which included a two-stage process for the development and evaluation of conceptual alternatives. The development stage included a data collection task which would allow the Study Team to determine existing conditions and issues with the area. The alternatives would be evaluated by investigating the environmental, engineering, and mobility impacts for each alternative. Several potential issues were identified by the Stakeholders that they requested be addressed in the study. First, due to truck traffic concerns it was recommended that the study investigate the feasibility of extending Robert E. Lee. Secondly, identify truck impact to the area for each conceptual alternative. Thirdly, it is important to alleviate or minimize congestion near the residential areas. From this meeting with stakeholders, City staff and citizens defined the following goals:

- Improve north-south mobility
- Minimize truck traffic in residential areas
- Minimize refinery exposure and impact
- Construct road for reasonable cost
- Avoid railroad impacts/crossings
- Minimize environmental/social impacts

### 4.1.2 Stakeholder Meeting #2

Stakeholder Committee Meeting #2 was held on **April 14, 2005 at 1:30 PM** in the Western Refining Conference Room. The purpose of this meeting was to determine conceptual alternatives, identify additional potential impacts, and understand the stakeholders' goals for this project. Stakeholders were asked to rank the project goals that were attained from the first stakeholder meeting. The above table illustrates the stakeholders' preferences for the project goals.

| Rank | Goal |
|---|---|
| 1 | Improve north-south mobility |
| 2 | Minimize refineries' exposure and impact |
| 3 | Minimize environmental impact |
| 4 | Construct road for reasonable cost |
| 5 | Minimize truck traffic in residential areas |
| 6 | Avoid railroad impacts/crossings |

Next, a presentation conveyed the project status and an explanation of the issues surrounding construction of an extension of Airway Boulevard from IH-10 to North Loop Drive. An explanation of some of the issues that have been determined from the data collection effort was presented. Then maps were provided that displayed the specific constraints within the study area. These included utilities, landfills, property areas, drainage features, and ponds.

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The study team then led the group in a workshop session where the stakeholders broke out into five groups. Each team was to draw roadway alternatives, perform a very general evaluation of the impacts, and present the results to the rest of the group.

The groups came up with a number of alternatives. The exercise assured that they would consider the entire universe of conceptual roadway alternatives.

The open workshop environment also presented an excellent forum to discuss concerns and issues between property owners, facility operators, utility providers, City administrators and elected officials, railroad representatives, and State transportation officials. These concerns and issues are summarized below. The entire group was not necessarily consenting on all of the following comments:

- It was desired that any proposed alignment tie into Delta Drive or provide connection to Alameda Avenue.
- The main goal of Western Refining and Phelps Dodge was to minimize any security risks to their businesses.
- The main goal of Union Pacific was to avoid or minimize any railroad impacts. While they would be open to hearing ideas of any railroad relocation, they stressed that it would be very expensive.
- The main goal of City officials was to improve north-south mobility.
- It was desired to minimize truck traffic in the neighborhood.
- Hawkins Boulevard currently is heavily congested and an alignment from Hawkins Boulevard might only add to the problem.
- In considering the relocation of utility lines, it is important to consider not only the cost but also the time that it takes to identify and reserve right-of-way for an alternate location.
- Cost should not be the determining factor in analyzing alternatives.


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### 4.1.3 Stakeholder Meeting #3

Stakeholder Committee Meeting #3 was held on **June 20, 2005 at 10:30 AM** in the Western Refining Conference Room. The purpose of this meeting was for the Study Team to share the findings of the evaluation and gain input from the Stakeholder Committee. The Study Team provided a project overview along with the results of the questionnaire from the first public meeting. A summary of the questionnaire results are provided below:

- The majority of the participants said that a new roadway is needed and that it would improve north-south mobility as well as decrease congestion.
- The most important factor in determining a preferred route, according to participants from the first public meeting, was the quickest and straightest route.
- Residential areas were the most important land use that should be avoided.
- Designating truck routes was favored over closing street connections.
- The preferred option showed at the first public meeting was the Airway Boulevard to Delta Drive connection.

A brief description of some of the constraints within the study area was described. As directed in previous meetings with the City and TxDOT, the Study Team developed additional alternatives that showed a potential connection from Alameda Avenue to Border Highway along Azcarate Park. The location of the potential connection would need to be studied in the future. While it was recognized that a future connection would be beneficial, the Stakeholder Committee suggested that any option showing a potential connection to Border Highway not be carried forward at this point because the location of this future alignment could not be determined. It would require additional study that was not included in the bounds of this study. Therefore, none of the alignments would go farther south than North Loop Drive for this study.

The Study Team presented the evaluation of closing Trowbridge Drive. The following results were determined from the evaluation if Trowbridge Drive was closed between Marlow Road and Delta Drive:

- Approximately two lanes of traffic would be added to Alameda Avenue which would overload this four-lane arterial.
- The section of IH-10 between Trowbridge Drive and Airway Boulevard would also gain traffic if the arterial was closed.
- It was pointed out by a Stakeholder Member that Trowbridge Drive serves as a reliever route when IH-10 is overly congested.
- Trowbridge Drive serves Sun Metro bus routes.
- Additional traffic would be placed on Clark Drive and Delta Drive if Trowbridge Drive was closed.

From a traffic standpoint, it was recommended by the Study Team that Trowbridge Drive remain open.

Representatives of Western Refining explained that they would push for the closing of Trowbridge Drive between Marlow Road and Delta Drive. From a security and exposure standpoint, it was explained that closing Trowbridge Drive was essential. Western Refining would not support any project that went along Western's property if Trowbridge


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Drive was not closed. From discussion within the Stakeholder Committee, the Study Team was directed to present both sides of this issue to the public at the public meeting on June 30th.

The evaluation of relocating the railroad was also presented. Four railroad relocation options were developed. The following reasons were given to show that relocating the railroad was not feasible:

- All railroad relocation options rerouted the railroad onto Western Refining's property. The result of these options would be heavy impacts to the refining operations.
- In an effort to provide the benefit of eliminating an at-grade railroad crossing, all of the railroad relocation options included the closing of Trowbridge Drive.

It was determined that relocating the railroad was not feasible.

The evaluation was broken down into three phases. The first phase showed the connection between Airway Boulevard and Robert E. Lee to the industrial area. The Study Team explained that any connection to Robert E. Lee would cause operational and safety concerns due to the current configuration of the interchange at IH-10. Therefore, these options were eliminated. The recommendation for Phase 1 was to provide two-lane connections between Airway Boulevard and the Industrial Park (Commerce, Industrial Avenue, and Market Avenue) along with a corridor access management plan along Hawkins Boulevard. This access management plan would be determined in a future study. It was later determined by City Staff that the access management plan would be part of the planned Hawkins Boulevard expansion to six lanes. The purpose of this phase is to provide another access to IH-10 for the trucks coming from the Industrial Park and to get them off of Hawkins Boulevard. It was suggested by the Stakeholder Committee that only the connection of Airway Boulevard to Market Avenue should be provided so Industrial Avenue and Commerce are not overloaded. The committee asked the Study Team to analyze the safety of this option.

Phase 2 consisted of the following options:

- Four-lane alternative between Airway Boulevard to Delta Drive
- Four-lane alternative between Hawkins Boulevard and North Loop Drive (west connection)
- Four-lane alternative between Hawkins Boulevard and North Loop Drive (Copperqueen Drive)
- Four-lane alternative between Airway Boulevard and Hawkins Boulevard south of Market Avenue

While the Airway Boulevard to Delta Drive connection results in higher improvements to north-south mobility it results in higher costs and impacts. It was determined that the connection between Airway Boulevard and Hawkins Boulevard south of Market Avenue should be eliminated because of the impacts to utilities. Also, it was determined within the evaluation and agreed to by the Stakeholder Committee that the connection between Hawkins Boulevard and North Loop Drive via Copperqueen Drive would provide more benefit than the other connection between Hawkins Boulevard and North Loop Drive.


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The Stakeholder Committee suggested that the following options be taken to the Public Meeting:

- Four-lane alternative between Airway Boulevard to Delta Drive
- Four-lane alternative between Hawkins Boulevard and North Loop Drive (Copperqueen Drive)

All of the Phase 3 options that showed a potential connection to the Border Highway were eliminated. The Stakeholder Committee suggested that a future connection would need to be determined by a future study. This future connection includes but is not limited by Delta Drive/Fonseca Drive, along Azcarate Park and the drainage ditch located east of the Park.

The following summarizes the direction of the Stakeholder Meeting to the Study Team for the Public Meeting #2:

- Present the evaluation of closing Trowbridge Drive from a traffic and exposure/security standpoint
- Do not present any alternative that goes south of North Loop Drive
- Present Phase 1 recommendations as a connection between Airway Boulevard and Market Avenue with access management plan along Hawkins Boulevard
- Present Phase 2 as a connection between Hawkins Boulevard and North Loop Drive
- Present Phase 3 as a connection between Airway Boulevard and Delta Drive
- Provide a drawing showing all three phases together

### 4.1.4 Stakeholder Meeting #4

Stakeholder Committee Meeting #4 was held on **July 25, 2005 at 9:30 AM** in the City of El Paso Engineering Conference Room. The purpose of this meeting was for the Study Team to share their recommendations for an action plan and gain input from the Stakeholder Committee on the submitted draft report.

The recommendations were broken into three major phases as highlighted below.

**Phase 1A.** A future study to determine an access management plan along Hawkins Boulevard from IH-10 to just south of Market Avenue. An access management plan might include the creation of turning lanes, the consolidation of driveways and traffic signals, and signal timing and intersection improvements. It was discussed during the meeting that Hawkins Boulevard is already planned to be upgraded to a six-lane facility. The access management plan was eliminated from Phase 1 after the meeting discussion because it was determined by the City that this plan would be incorporated as part of the planned expansion of Hawkins Boulevard to six lanes.

**Phase 1B**. A two-lane connector between Airway Boulevard and Market Avenue to allow truck traffic an alternate route to or from IH-10, other than Hawkins Boulevard. The estimated cost for the connector is $2.6 million, excluding environmental remediation.


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**Phase 2**. A four-lane connector between the western bend of Hawkins Boulevard and North Loop Drive to increase mobility. Construction costs are estimated at $5.5 million, excluding environmental remediation.

**Phase 3**. A four-lane roadway between Airway Boulevard and Delta Drive on the eastern side of the existing railroad line. The connector would be on-structure (elevated) for the majority of the roadway. Once the roadway crosses the railroad mainline and an existing railroad spur serving Western Refining, it would go down to connect into Delta Drive. This new north-south arterial would result in a considerable improvement to the transportation system with high impacts to utilities and some impacts to businesses. The estimated construction cost is $30 million, excluding environmental remediation.

An additional recommendation was that a future study be performed to determine the location of a connection down to Border Highway. It was also reemphasized that from a traffic standpoint, Trowbridge Drive should remain open. Also, it was determined that relocating the railroad would not be a feasible option. The action plan presented provided necessary steps in order to complete construction of each recommended project.

An open discussion of the project took place after the project recommendations and action plan was presented. The discussion provided a forum to discuss concerns and issues between property owners, facility operators, utility providers, City administrators and elected officials, railroad representatives, and State transportation officials. The issues discussed are summarized below. The entire group was not necessarily consenting on all of the following comments:

- While it was recognized that the study area for this project ended at Trowbridge Drive/North Loop Drive, the ultimate goal should be for the new alignment to reach Border Highway
- Western Refining and Phelps-Dodge expressed concern over the risk of exposure to their property with any new alignment that would travel between Airway Boulevard and Delta Drive
- Western Refining desired to close Trowbridge Drive between Marlow Road and Delta Drive
- Phelps-Dodge preferred the Phase 1 and Phase 2 alignments because it minimizes impact to their operation and provides an improved route to IH-10
- The El Paso Water Utilities expressed concern over the possibility of needing to relocate utilities more than once throughout the phased recommendations

## 4.2 PUBLIC MEETINGS

The public meetings provided similar feedback as the Stakeholder Committee Meetings in that they were used to identify issues and constraints, make modifications based on input received, and ultimately reach a consensus on the project process. Through the meetings, the general public played an active role in the decision making process. The Airway Boulevard Feasibility Study will provide two Public Meetings. The Public Meetings are formatted in such a way that the Study Team is able to interact with the business owners, home owners, public officials, and other interested parties in both a group and one-on-one settings. Comments were encouraged through surveys and


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group question/answer times. Input received from the public was used by the Study Team in order to assist in the evaluation of the process and conclusions. The following paragraph provides a summary of the first Public Meeting held for this study.

### 4.2.1 Public Meeting #1

A public meeting was held on Thursday, **April 28, 2005 at Henry's Ballroom** in El Paso. The purpose of the meeting was to provide information and solicit comments on the Airway Boulevard Feasibility Study. The open house officially began at 6:00 PM. Citizens were allowed to view the displays prior to the presentation. Boards showing a City street map, land use map of the study area, project goals, study process, conceptual alternatives, and project schedule were displayed. Registration was taken at the entrance of the building. Survey and comment forms were available. Eight public officials and 68 private citizens attended the Public Meeting.

The project purpose and goals were summarized along with the progress of the study. The conceptual alternatives were then described. Six groups of alternatives were presented for this meeting. The following provides a brief description of each alternative presented:

**Connection to Industrial Avenue.** Two options that showed a connection from Robert E. Lee and Airway Boulevard, respectively, to Industrial Avenue. Each alternative was a two-lane roadway with the intention of providing improved circulation to the trucks.

**Connection to Market Avenue**. Two options that showed a connection from Robert E. Lee and Airway Boulevard, respectively, to Market Avenue. Each alternative was a two-lane roadway with the intention of providing improved circulation to the trucks.

**Connections to Hawkins Boulevard South of Market Avenue**. This option showed a four-lane option from Airway Boulevard to Hawkins Boulevard that connected just south of Market Avenue. A two-lane roadway was shown connecting from Robert E. Lee to the four-lane connector.

**Airway Boulevard to Delta Drive on the East Side of the Railroad.** This option provides a direct connection between Airway Boulevard and Delta Drive with a four-lane roadway.

**Airway Boulevard to Delta Drive After Relocating Railroad**. This option shows a four-lane roadway connecting these two roadway as it travels along the railroad right-of-way. The relocation of this rail line has been discussed briefly with Union Pacific but no recommendation or agreement with them has been made.

**Hawkins Boulevard Connection to North Loop Drive**. These two options provide four-lane roadways from Hawkins Boulevard to North Loop Drive. The first option connects to North Loop Drive west of Copperqueen Drive while the second option utilizes Copperqueen Drive to connect to North Loop Drive.


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### 4.2.2 Public Meeting #2

A public meeting was held on Thursday**, June 30, 2005 at Ramona Elementary School** in El Paso. The purpose of the meeting was to present the evaluation and recommendations of viable alternatives as well as solicit comments on the Airway Boulevard Feasibility Study. The open house officially began at 6:00 PM. Citizens were allowed to view over 30 displays prior to the presentation. Registration was taken at the entrance of the building. Survey and comment forms were available. Twelve public officials and 30 private citizens attended the Public Meeting. The result of this study was to identify transportation alternatives, evaluate benefits and impacts, and then to present recommendations. The following provides a brief description of each of the topics presented.

**Evaluation of Closing Trowbridge Drive.** Western Refining has expressed their desire to close Trowbridge Drive between Marlow Road and Delta Drive in order to minimize any type of security risk to their operation. If a new roadway was constructed next to their property, it would result in having a roadway fronting four sides of the Western Refining property. Therefore, from a security perspective closing Trowbridge Drive would minimize the security risk to Western Refining.

However, from a transportation perspective, closing Trowbridge Drive would result in increased congestion along Alameda Avenue and IH-10. The evaluation of closing Trowbridge Drive from a transportation perspective resulted in the following conclusions:

- Approximately two lanes of traffic would shift to Alameda Avenue
- Additional traffic would be shifted to IH-10 between Trowbridge Drive and Airway Boulevard
- Trowbridge Drive is currently an alternate route to IH-10 when congested
- Additional traffic to Clark Drive and Delta Drive
- Impacts to Sun Metro Bus Routes

Therefore, from a transportation perspective it was recommended that Trowbridge Drive remain open. It is recognized that ultimately this is a policy decision.

**Evaluation of Relocating the Railroad.** Four options were developed showing the relocation of the railroad. All of the options included the closing of Trowbridge Drive in order to provide the benefit of removing an at-grade location. Also, in order to maintain service to the industrial area it was necessary to keep the railroad within the study area. Therefore, all of the options were along the Western Refining property. Due to the impacts to the operational areas of Western and the determination that closing Trowbridge Drive was not desirable, it was determined that relocating the railroad was not feasible. All options showing the railroad relocated were eliminated.

**Phase 1.** Phase1 alternatives would result in lower impact and shorter construction time. The first phase was an evaluation between two-lane connectors from Airway Boulevard or Robert E. Lee and the Industrial Park. The purpose of these alternatives was to provide an alternate route to Hawkins Boulevard for trucks in the Industrial Park to reach IH-10. As a result it is expected that truck traffic along Hawkins Boulevard would decrease. The evaluation resulted in the following recommendations:


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- Access management plan along Hawkins Boulevard that is to be determined in a future study
- Two-lane roadway between Airway Boulevard and Market Avenue

The access management plan was eliminated from Phase 1 after the meeting discussion because it was determined by the City that this plan would be incorporated as part of the planned expansion of Hawkins Boulevard to six lanes.

**Phase 2.** Alternatives would result in increasing level of impacts with the benefit of increased travel time improvements. The second phase was an evaluation between a No-Build scenario and a four-lane alternative between Hawkins Boulevard and North Loop Drive. The alternative resulted in improved travel time, safety, and regional mobility. Minor impact is expected at Hawkins Boulevard and IH-10 once improvements are made along Hawkins Boulevard. The engineering evaluation included exposure to the industrial area, utility impacts, constructability, and cost. The evaluation showed minor impacts in each of these areas. The estimated cost of $4.9 million did not include environmental clean-up that might need to occur given that the study area is completely industrial. The environmental evaluation showed minor impacts to land uses, historical resources, and water resources. Given the location of the study, it was determined that potential hazardous materials exist. The Phase 2 recommendation included a four-lane alternative connecting Hawkins Boulevard and North Loop Drive.

**Phase 3.** The third phase alternatives would result in high impacts with larger benefits to mobility. Phase 3 compared a No-Build scenario with a four-lane alternative between Airway Boulevard and Delta Drive. In terms of mobility the connection between Airway Boulevard and Delta Drive is projected to result in significant travel time savings, safety improvements, and regional mobility improvements. The impact to IH-10 and Airway Boulevard would be that improved signal timing is required due to the additional phase. The southbound left turning traffic is projected to decrease. The engineering evaluation showed increased impacts to the industrial area, high impacts to utilities, difficult constructability due to the proximity to utilities and the railroad, and an estimated cost of $30 million. This cost does not include potential environmental clean-up. From the environmental evaluation, land uses, historical resources, and water resources are projected to result in some impacts. The impacts due to hazardous materials are projected to be significant. The Phase 3 recommendation was to construct the four-lane connector between Airway Boulevard and Delta Drive with a future study to be performed to determine the location of a potential connection down to Border Highway. It was explained that the City and TxDOT desires to provide a connection between IH-10 and Border Highway. However, the analysis between North Loop Drive and Border Highway was not to be performed during this study.

The recommended phasing plan recommended during Stakeholder Meeting #4 and Public Meeting #2 was altered prior to the finalizing of this report. Due to the City's desire to minimize right-of-way impacts and the lack of significant travel time savings, it was recommended by City Staff prior to the finalizing of the study that the four-lane connector between the western bend of Hawkins Boulevard and North Loop Drive be eliminated. Also, it was determined that the suggested access management plan along Hawkins Boulevard would occur in conjunction with the planned Hawkins Boulevard expansion to six lanes. Therefore, the access management plan was eliminated from


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the phased plan. Based on these revisions, the following phasing plan was recommended:

**Phase 1**. A two-lane connector between Airway Boulevard and Market Avenue to allow truck traffic an alternate route to or from IH-10, other than Hawkins Boulevard. The estimated cost for the connector is $2.6 million, excluding environmental remediation.

**Phase 2**. A four-lane roadway between Airway Boulevard and Delta Drive on the eastern side of the existing railroad line. The connector would be on-structure (elevated) for the majority of the roadway. Once the roadway crosses the railroad mainline and an existing railroad spur serving Western Refining, it would go down to connect into Delta Drive. This new north-south arterial would result in a considerable improvement to the transportation system with high impacts to utilities and some impacts to businesses. The estimated construction cost is $30 million, excluding environmental remediation.

**Phase 3**. While this study focused on the area between IH-10 and Trowbridge Drive/North Loop Drive, it is recommended that a future study determine the location and feasibility of constructing a north-south roadway that would continue the connection proposed in Phase 2 down to Border Highway. Possible study locations of this new roadway would include but are not limited to the east end of Azcarate Park as well as the existing drainage easement east of the park.


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# 5.0 CONCEPTUAL ALTERNATIVES ANALYSIS

## 5.1 ALTERNATIVE IDENTIFICATION

The Airway Boulevard Feasibility Study was focused on improving north-south movement between the south side of El Paso and the north side of El Paso in an attempt to connect with large retail areas and the El Paso International Airport. The Feasibility Study process began with the identification of several initial Conceptual Alternatives. These alternatives were developed with input from Stakeholders, Study Team members, and the general public. The first phase evaluation consisted of a fatal-flaw order of magnitude level of assessment for these alternatives. Alternatives were eliminated if they were found to have significant deficiencies, adverse environmental, engineering, or mobility impacts.

The first phase of the alternatives analysis process resulted in the identification of several Viable Alternatives to be studied. These Viable Alternatives were carried forward to the second phase of the analysis process, which resulted in the identification of the feasible alternatives.

### 5.1.1 Industrial Avenue Connections

Two of the alternatives developed connect to Industrial Avenue. Industrial Avenue is a two-lane roadway with area for street parking that serves industrial traffic. This roadway provides minimal area for expansion because the majority of the businesses are located very close to the travel way. For these alternatives, no additional capacity is provided for Industrial Avenue. The connections provide direct access to Hawkins Boulevard. **Figure 5-1** shows these alternatives.

#### 5.1.1.1 Airway Boulevard to Industrial Avenue (No-Build)

This option extends Airway Boulevard south of IH-10 and curves eastbound to connect to existing Industrial Avenue. The total length for this two-lane roadway would be approximately 0.25 mile. Since, the El Paso Metropolitan Planning Organization Transportation Plan currently shows a connection between Airway Boulevard and Industrial Avenue, this option was considered the No-Build alternative. The No-Build option served as a baseline for the study.

#### 5.1.1.2 Robert E. Lee to Industrial Avenue

This alternative extends Robert E. Lee south of IH-10 and curves eastbound to Industrial Avenue. The total length for this new location two-lane roadway would be approximately 0.5 mile.


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### 5.1.2 Market Avenue Connections

Two of the alternatives developed connect to Market Avenue. Market Avenue is a two-lane roadway with area for street parking that serves industrial traffic and provides adequate set back distance from businesses. The connections provide direct access to Hawkins Boulevard. No additional capacity would be proposed for Market Avenue. **Figure 5-2** shows these alternatives.

#### 5.1.2.1 Airway Boulevard to Market Avenue

For this alternative, Airway Boulevard was extended south of IH-10 and curves eastbound to connect to existing Market Avenue. The total length for this new location two-lane roadway would be approximately 0.6 of a mile.

#### 5.1.2.2 Robert E. Lee to Market Avenue

This option provides a two-lane roadway from Robert E. Lee to Market Avenue. The total length for this new facility would be 0.75 of a mile.

### 5.1.3 Connection to Hawkins Boulevard South of Market Avenue

This alternative provides connection to Hawkins Boulevard from Airway Boulevard and Robert E. Lee. The connection to Hawkins Boulevard occurs south of Market Avenue with a four-lane roadway coming from Airway Boulevard. A two-lane roadway tees into the Airway Boulevard extension approximately 500 feet south of IH-10. The alternative includes realigning Hawkins Boulevard so that it creates a 4-legged intersection with the proposed route. A portion of the existing curve on Hawkins Boulevard would be eliminated. **Figure 5-3** shows this option.

### 5.1.4 Delta Drive Connection on the West Side of the Railroad

Two four-lane alternatives were developed that connect directly to Delta Drive from Airway Boulevard and Robert E. Lee. Delta Drive is a four-lane roadway that currently tees into Trowbridge Drive/North Loop Drive. **Figure 5-4** shows these two alternatives.

#### 5.1.4.1 Airway Boulevard to Delta Drive on West Side of Railroad

This alternative extends Airway Boulevard south of IH-10 and travels southwest until crosses the railroad with a bridge structure. Once crossing the railroad, the alignment curves south and follows the railroad line along the west side. The alignment would travel the east side of the Western Refining property and the west side of the railroad right-of-way. The alignment connects to Delta Drive at-grade. The total length of the alternative is approximately one mile.

#### 5.1.4.2 Robert E. Lee to Delta Drive on West Side of Railroad

This option provides an extension from Robert E. Lee on the east side of the railroad. The alignment crosses the railroad on structure and at a skew approximately 0.4 of a mile south of IH-10. The alignment then follows the same path as described in the previous alternative. The total length of this alternative is approximately 1.25 miles.


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### 5.1.5 Delta Drive Connection on the East Side of the Railroad

Four alternatives were developed that connect directly to Delta Drive from Airway Boulevard and Robert E. Lee. These four-lane options all travel along the east side of the railroad. Two separate options were developed for crossing the railroad near Delta Drive. The first option crosses the railroad on structure and at a skew approximately 500 feet from the Delta Drive connection. Since this would not be enough distance to connect to Trowbridge Drive/North Loop Drive at-grade, it was necessary to maintain the alignment on structure over North Loop Drive. The alignment would then connect to Delta Drive as it is on structure over the railroad located south of Trowbridge Drive.

The second group of options cross the railroad on structure and at a skew approximately 1,000 feet from the Delta Drive connection. This option provides enough distance so that the new roadway alignment is able to connect to Trowbridge Drive/North Loop Drive at-grade.

#### 5.1.5.1 Airway Boulevard to Delta Drive on East Side of Railroad with Delta Drive Elevated Over North Loop Drive

This alternative extends Airway Boulevard south of IH-10 and stays on the east side of the railroad. In order to maintain service to the existing railroad spurs, it would be necessary to begin the structure approximately 1,800 feet south of IH-10. The alignment stays on structure as it crosses the other spurs and then the railroad mainline a skew approximately 500 feet from the intersection. The roadway stays elevated over North Loop Drive and connects to the Delta Drive bridge. The total length for this alignment is approximately 1.25 miles. **Figure 5-5** depicts this option.

#### 5.1.5.2 Robert E. Lee to Delta Drive on East Side of Railroad with Delta Drive Elevated Over North Loop Drive

This option extends Robert E. Lee south of IH-10 and follows the railroad on the east side of the railroad until it nears Delta Drive. Like the previous alternative, this roadway would cross the railroad spur approximately 1,800 feet south of IH-10 on structure and then stay on structure over the railroad mainline and North Loop Drive before connecting into Delta Drive. The total length for this option is approximately 1.5 miles. **Figure 5-5** depicts this option.

#### 5.1.5.3 Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive

This alternative extends Airway Boulevard south of IH-10 and follows the railroad on the east side of the railroad. The alignment crosses the first railroad spur approximately 1,800 feet south of IH-10 and then crosses the railroad mainline approximately 1,000 feet north of Delta Drive. This distance would be adequate to provide an at-grade connection with Trowbridge Drive/North Loop Drive. The total length for this alignment is approximately 1.15 miles. **Figure 5-6** shows this alternative.


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#### 5.1.5.4 Robert E. Lee to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive

This option provides an alignment from Robert E. Lee to Delta Drive located on the east side of the railroad. As in the previous option, the alignment is on structure for the majority of the alignment prior to crossing to the west side of the railroad approximately 1,000 feet north of Delta Drive so that it can connect at-grade to Trowbridge Drive/North Loop Drive. The total length of the alignment is approximately 1.35 miles. **Figure 5-6** shows this alternative.

### 5.1.6 Airway Boulevard to Delta Drive Connection after Relocating Railroad

One of the major constraints for the alternatives connecting to Delta Drive is the railroad. Therefore, this option uses the existing railroad right-of-way as the location of the new roadway, but requires the railroad to be relocated. This four-lane alternative provides an extension for Airway Boulevard south of IH-10 that follows the railroad right-of-way until it connects to Delta Drive. The total length of this alternative is approximately 1.25 miles. **Figure 5-7** shows this alternative.

### 5.1.7 Hawkins Boulevard Connection to North Loop Drive

Three four-lane alternatives were developed that provide a connection from Hawkins Boulevard south to Trowbridge Drive/North Loop Drive. Each of the alternatives shows a three-legged intersection at the Hawkins Boulevard connection with a portion of the curve to be eliminated. **Figure 5-8** shows these three alternatives.

#### 5.1.7.1 Hawkins Boulevard to Delta Drive

This four-lane alternative extends Hawkins Boulevard south into the Phelps-Dodge Mining property, crosses an athletic field and then curves southwest towards Delta Drive. There is a very active railroad spur on the Phelps-Dodge property located south of the athletic field. In order to avoid this constraint, it would be necessary to provide a bridge over the railroad spur. Due to the location of the railroad mainline, the connection to Delta Drive would need to be elevated over Trowbridge Drive/North Loop Drive. The total length for this option is approximately one mile.

#### 5.1.7.2 Hawkins Boulevard to North Loop Drive (West Connection)

This option extends Hawkins Boulevard south into the Phelps-Dodge Mining property and curves southwest until it connects to North Loop Drive approximately 0.5 mile east of Delta Drive. There is a very active railroad spur on the Phelps-Dodge property located south of the athletic field. In order to avoid this constraint, it would be necessary to provide a bridge over the railroad spur. The total length for this alternative is approximately 0.7 mile.

#### 5.1.7.3 Hawkins Boulevard to North Loop Drive along Copperqueen Drive

This alternative extends Hawkins Boulevard south into the Phelps-Dodge Mining property and connects to North Loop Drive along Copperqueen Drive. There is a very active railroad spur on the Phelps-Dodge property located south of the


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athletic field. In order to avoid this constraint, it would be necessary to provide a bridge over the railroad spur. Copperqueen Drive is a four-lane roadway that provides access to an industrial area. The total length for this alternative is approximately 0.5 mile.

### 5.1.8 Airway Boulevard to Marlow Road

A four-lane alternative extended Airway Boulevard south of IH-10 and then curved southwest towards the intersection of Trowbridge Drive and Marlow Road. The alternative connected to Trowbridge Drive on the western end of Western Refining property. This alternative would include a bridge structure over the railroad. The total length for this alternative is approximately one mile. **Figure 5-9** shows these this alternative.


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**Figure 5-1 Industrial Avenue Connections**


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**Figure 5-2 Market Avenue Connections**


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**Figure 5-3 Connection to Hawkins Boulevard South of Market Avenue**


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**Figure 5-4 Delta Drive Connection on West Side of Railroad**


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**Figure 5-5 Delta Drive Connection on East Side of Railroad Elevated Over North Loop Drive**


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**Figure 5-6 Delta Drive Connection on East Side of Railroad At-Grade with North Loop Drive**


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**Figure 5-7 Airway Boulevard to Delta Drive After Railroad Relocation**


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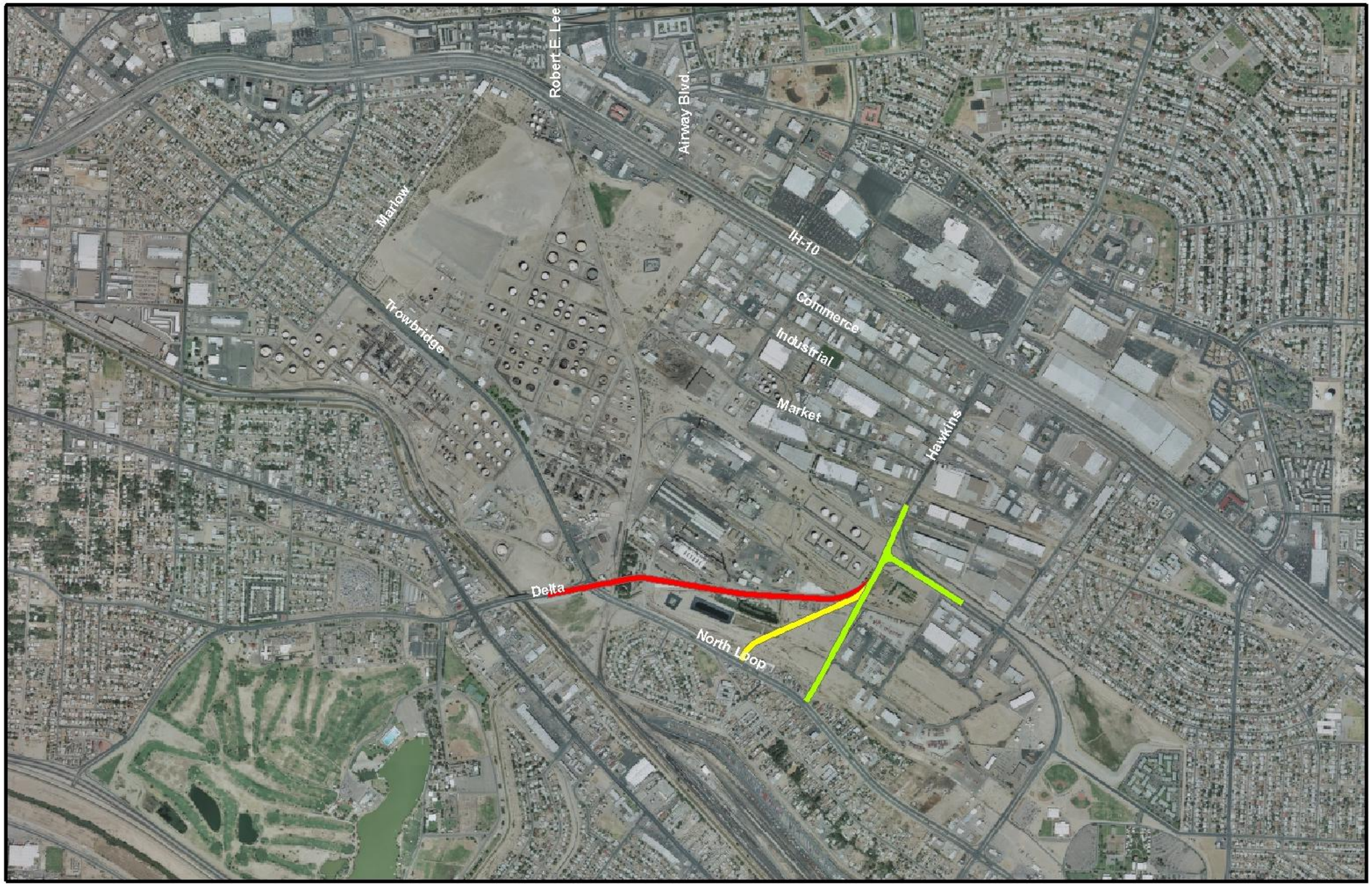


**Figure 5-8 Hawkins Boulevard Connection to North Loop Drive**


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**Figure 5-9 Airway Boulevard to Marlow Road**


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## 5.2 ENVIRONMENTAL IMPACTS

The following section describes the environmental impacts identified through a preliminary review of the alternatives. This is not intended to replace an environmental review in accordance with TxDOT and FHWA standards under the National Environmental Policy Act (NEPA) that would be required during preliminary design.

### 5.2.1 Industrial Avenue Connections

#### 5.2.1.1 Airway Boulevard to Industrial Avenue (No-Build)

This two-lane option involves new construction between Airway Boulevard and Industrial Avenue and would result in minimal impacts. Since this option is currently shown on the City of El Paso Metropolitan Planning Organization Plan, it was considered the No-Build solution. An impact to a local trucking distribution company would occur near the Airway Boulevard connection. However, access to the business would be maintained. The connection to Industrial Avenue would result in minimal environmental impacts.

#### 5.2.1.2 Robert E. Lee to Industrial Avenue

The two-lane alternative that connects Robert E. Lee to Industrial Avenue would result in similar impacts. The trucking distribution center would be impacted near IH-10 while the connection to Industrial would result in minimal impacts to businesses.

### 5.2.2 Market Avenue Connections

#### 5.2.2.1 Airway Boulevard to Market Avenue

The Airway Boulevard to Market Avenue connection resulted in the same impacts as shown in the previous options. The impact to the trucking distribution center near IH-10 will be minor while the connection to Market Avenue will impact one business.

#### 5.2.2.2 Robert E. Lee to Market Avenue

The Robert E. Lee to Market Avenue will result in the same impacts as the previous alternative. The trucking distribution center will be impacted as well as the business near the Market Avenue connection.

### 5.2.3 Connection to Hawkins Boulevard South of Market Avenue

The four-lane connection between Airway Boulevard and Hawkins Boulevard would result in three commercial impacts. Additionally, this roadway would impact the 100-year floodplain associated with a concrete drainage to the Phelps-Dodge Detention Basin located east of the project area near Hawkins Boulevard.


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## 5.2.4 Delta Drive Connection on the West Side of the Railroad

### 5.2.4.1 Airway Boulevard to Delta Drive on West Side of Railroad

As this alternative provides a four-lane alternative along the west side of the railroad from Airway Boulevard to Delta Drive, impacts to Western Refining are likely. The alignment would result in impacting six storage tanks. Based on the age of Western Refining, the complex would need to be evaluated for NRHP eligibility. Additionally, a 1940's mixed-use neighborhood on North Loop Drive immediately south of Phelps-Dodge would also require evaluation for NRHP eligibility. This alternative would also result in impacts to the trucking distribution center at the IH-10 connection.

### 5.2.4.2 Robert E. Lee to Delta Drive on West Side of Railroad

This alternative would result in the same impacts as the above option.

## 5.2.5 Delta Drive Connection on the East Side of the Railroad

### 5.2.5.1 Airway Boulevard to Delta Drive on East Side of Railroad with Delta Drive Elevated Over North Loop Drive

This alternative provides a four-lane alternative with an elevated structure over the railroad and Trowbridge Drive/North Loop Drive. Due to the proximity of the residential neighborhood located on Phelps-Dodge property, it is likely that impacts would occur. Any impacts to this neighborhood would require the evaluation of NRHP eligibility. Noise levels could also impact the residential neighborhood. Impacts to the trucking distribution center at IH-10 would also occur as well as a building near Delta Drive.

### 5.2.5.2 Robert E. Lee to Delta Drive on East Side of Railroad with Delta Drive Elevated Over North Loop Drive

This alternative would result in the same impacts as the above option.

### 5.2.5.3 Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive

This four-lane alternative would provide an at-grade connection to North Loop Drive at Delta Drive. Potential impacts to the historic residential district could occur which would require an evaluation of NRHP eligibility. The trucking distribution center near IH-10 would be impacted as well as the building near the new intersection at Delta Drive. Noise impacts could occur for the Phelps-Dodge residential neighborhood. Additionally, construction phasing near the Phelps-Dodge neighborhood could cause disruption for the residences.


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#### 5.2.5.4 Robert E. Lee to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive

This four-lane alternative from Robert E. Lee results in similar impacts as the option described previously.

### 5.2.6 Airway Boulevard to Delta Drive Connection after Relocating Railroad

This four-lane connection shows the roadway along the existing railroad right-of-way. Impacts to the historic Phelps-Dodge residential housing could occur. The trucking distribution center at IH-10 and the building located at Delta Drive would be impacted with this alternative.

### 5.2.7 Hawkins Boulevard Connection to North Loop Drive

#### 5.2.7.1 Hawkins Boulevard to Delta Drive

This alternative is a four-lane roadway from Hawkins Boulevard to Delta Drive. The roadway travels directly through an athletic field owned by Phelps-Dodge. Additionally, this option impacts the Phelps-Dodge residential neighborhood. This option also directly impacts the operation of Phelps-Dodge. Due to the location of the railroad, it would be necessary that the roadway remain on structure over Trowbridge Drive/North Loop Drive. The alternative would also impact the 100-year floodplain associated with the Phelps-Dodge Detention Basin.

#### 5.2.7.2 Hawkins Boulevard to North Loop Drive (West Connection)

This alternative provides a four-lane roadway from Hawkins Boulevard with a connection to North Loop Drive approximately 0.5 mile east of Delta Drive. The connection to North Loop Drive could have an effect on the residential neighborhood south of the Phelps-Dodge property due to construction phasing and noise. Additionally, the 1940's neighborhood would require evaluation for NRHP eligibility. The alternative also impacts the 100-year floodplain associated with concrete drainage to Phelps-Dodge Detention Basin. Noise impacts would be minimal.

#### 5.2.7.3 Hawkins Boulevard to North Loop Drive along Copperqueen Drive

This four-lane alternative provides a roadway from Hawkins Boulevard to North Loop Drive via Copperqueen Drive. The connection to North Loop Drive could have potential impact to the historic neighborhood located south of the Phelps-Dodge property. The Church of the Pentecostal and the residences could be impacted during construction. Similar to the previous Hawkins Boulevard options, the 100-year floodplain associated with the concrete drainage structure to Phelps-Dodge Detention Basin will be impacted.


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### 5.2.8 Airway Boulevard to Marlow Road

This option provides a four-lane roadway from Airway Boulevard to Marlow Road with one railroad crossing. The roadway would have to cross a landfill located on the west end of the refinery property. Additionally, this alternative would cross an unlisted but eligible historic telecommunications site as well impact a historic housing area. The San Juan Health Center would also be impacted due to noise and construction phasing.

## 5.3 HAZARDOUS MATERIALS

The "Hazardous Exposure Ranks," presented in **Table 5-1**, are based upon the potential hazardous sites in proximity to proposed roadway alternatives. Potential hazardous sites are assigned as those receiving a rank one or rank two in EDR Record Ranking Criteria. As presented in a previous section, the EDR Record Ranking Criteria is based upon the following:

1. Site with reported releases and/or contamination (LUST Sites, CERCLIS, etc.)
2. Regulated facilities with violations (RCRA Violators etc.).
3. Regulated facilities with no reported violations.
4. Closed facilities. Note closed facilities can be sources of contamination both as a consequence of contamination when active and/or due to a lack of on going maintenance of historic storage systems resulting in contamination.
5. Insufficient information to make a determination.

The "Hazardous Exposure Rank" is determined by summing the occurrences and giving a primary ranking based upon number of rank-1 occurrences then secondary ranking based upon the sum of occurrences of rank-1 and rank-2 along each roadway alternative.

The proximity to each roadway alternative is based upon the physical address as cited by the EDR report. Note, this physical address does not indicate the relative size of the property (1/2 acre or 10 acres), nor the configuration of the property (rectangle, serpentine, extend linear, etc.). Thus, proximity of potential contaminant sites should also be evaluated by field review along potential roadways, and review of aerial photography, inclusive of historic aerial photography. Also, while EDR cited "closed" facilities are not counted, as the presence of records for these sites does not exist, it should <u>not</u> be assumed that closed facilities translate to sites without toxic hazards. Closed facilities can, and often are, the locations of hazardous conditions, as a consequence of past storage facilities not being maintained, this resulting in undocumented leaks.


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**Table 5-1 Hazardous Exposure Ranks of Roadway Alternatives**

| Rank hits<br>Alternative | 1 | 2 | Total hits | Rank by PAHM* |
|---|---|---|---|---|
| Airway Boulevard to Industrial Avenue | 6 | 3 | 9 | 1 |
| Robert E. Lee to Industrial Avenue | 6 | 3 | 9 | 1 |
| Airway Boulevard to Market Avenue | 6 | 3 | 9 | 1 |
| Robert E. Lee to Market Avenue | 6 | 3 | 9 | 1 |
| Connection to Hawkins Boulevard South of Market Avenue | 14 | 12 | 26 | 4 |
| Airway Boulevard to Delta Drive on West Side of RR | 8 | 0 | 8 | 3 |
| Robert E. Lee to Delta Drive on West Side of RR | 8 | 0 | 8 | 3 |
| Airway Boulevard to Delta Drive on East Side of RR over North Loop Drive | 8 | 0 | 8 | 3 |
| Robert E. Lee to Delta Drive on East Side of RR over North Loop Drive | 8 | 0 | 8 | 3 |
| Airway Boulevard to Delta Drive on East Side of RR At-grade with North Loop Drive | 8 | 0 | 8 | 3 |
| Robert E. Lee to Delta Boulevard on East Side of RR At-grade with North Loop Drive | 8 | 0 | 8 | 3 |
| Airway Boulevard to Delta Drive after Re-locating RR | 8 | 0 | 8 | 3 |
| Hawkins Boulevard to Delta Drive | 7 | 3 | 10 | 2 |
| Hawkins Boulevard to North Loop Drive (West Connection) | 6 | 3 | 9 | 1 |
| Hawkins Boulevard to North Loop Drive along Copperqueen Drive | 6 | 3 | 9 | 1 |
| Airway Boulevard to Marlow Road | 6 | 3 | 9 | 1 |

*PAHM = Physical address hazardous Materials


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## 5.4 FATAL FLAW ANALYSIS

The fatal flaw analysis resulted in the elimination of seven alternatives. The following sections describe the alternatives that were eliminated based on the order of magnitude impacts along the alignments.

**Table 5-2 Eliminated Alternatives**

| Alternative | Brief Description |
|---|---|
| Delta Drive Connection on the West Side of the Railroad | 4-lane alternative from Airway Boulevard to Delta Drive |
| | 4-lane alternative from Robert E. Lee to Delta Drive |
| Delta Drive on the East Side of the Railroad | 4-lane alternative from Airway Boulevard to D elta Boulevard with grade separation at North Loop Drive |
| | 4-lane alternative from Robert E. Lee to Delta Drive with grade separate at North Loop Drive |
| | 4-lane alternative from Robert E. Lee to Delta Drive with at-grade connection at North Loop Drive |
| Hawkins Boulevard to Delta Drive Connection | 4-lane alternative from Hawkins Boulevard to Delta Drive with grade separation at North Loop Drive |
| Airway Boulevard to Marlow Road | 4-lane alternative from Airway Boulevard to Marlow Road |

The Conceptual Alternatives Analysis was based on a screening criteria discussed in a previous section. **Tables 5-3** through **5-6** are detailed matrices of all of the major issues identified with each alternative in terms of engineering and environmental impacts. A summarized general assessment of the alternatives is provided according to the screening criteria.

### 5.4.1 Delta Drive Connection on the West Side of the Railroad from Airway Boulevard and Robert E. Lee

Two four-lane options were developed that extended Airway Boulevard and Robert E. Lee, respectively, south of IH-10 and traveled along the west side of the railroad. These options are shown in **Figure 5-4**. These alternatives would result in high impacts to Western Refining operation as well as other utilities. Each of the alternatives would impact six refining tanks and two refining operation areas. Western Refining is considered a historical industrial property. Due to the high impact to refining operation, these two alternatives were eliminated.


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### 5.4.2 Delta Drive Connection on the East Side of the Railroad

Three of the four four-lane alternatives that called for the new roadway to be located on the east side of the railroad were eliminated. The two options that provided an elevated section over North Loop Drive were eliminated due to the potential impacts to businesses and residences near the interchange. These options are shown in **Figure 5-5**. Additionally, providing access between the new roadway and Trowbridge Drive/North Loop Drive would not have been feasible.

The third alternative eliminated was the option from Robert E. Lee to Delta Drive with an at-grade connection to Trowbridge Drive/North Loop Drive, as shown in **Figure 5-6**. This option was eliminated because it was not feasible to provide a four-lane roadway from Robert E. Lee. Due to the bridge structure and roadway configuration of Robert E. Lee and IH-10, the maximum capacity for an extension of this roadway would be two-lanes. Construction of these options would result in a high level of disruption to traffic and business operation within the study area.

### 5.4.3 Hawkins Boulevard to Delta Drive

This four-lane alternative that extended Hawkins Boulevard south towards Delta Drive resulted in a high level of impacts and was eliminated. The property of Phelps-Dodge Mining would be divided by the roadway which would result in a high level of exposure for the business. Two Phelps-Dodge buildings as well as a residential neighborhood would be impacted by this alternative. Additionally, due to the location of the railroad near the intersection of Delta Drive and Trowbridge Drive/North Loop Drive, the new roadway would have to be elevated over North Loop Drive. The elevated section would make a connection to North Loop Drive not feasible.

### 5.4.4 Airway Boulevard to Marlow Road

This four-lane alternative extended Airway Boulevard south of IH-10 and then curved southwest towards the intersection of Trowbridge Drive and Marlow Road. The major contributing factor to the elimination of this alternative was that the alignment crossed through an existing landfill. It would not have been feasible to cross an existing landfill due to potential soil contamination and other environmental issues.

The following tables summarize the analysis for each of the alternatives in terms of engineering and environmental impacts. The tables show a color scheme where green represents the options that were carried forward to the next phase and red represents the alternatives that were eliminated during the fatal flaw analysis. While the No-Build option is not shown in these matrices, it was carried forward to the next phase and will be evaluated based on achieving project goals.


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**Table 5-3 Engineering Analysis**

| Features | Industrial Avenue Connection | | Market Avenue Connection | | Delta Drive Connection on West Side of RR | | Delta Drive Connection on East Side of RR | | | | Hawkins Boulevard to North Loop Drive | | | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airway Boulevard to Industrial Avenue | Robert E. Lee to Industrial Avenue | Airway Boulevard to Market Avenue | Robert E. Lee to Market Avenue | Airway Boulevard to Delta Drive on West side of RR | Robert E. Lee to Delta Drive on West Side of RR | Airway Boulevard to Delta Drive on East Side of RR Elevated over North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR Elevated over North Loop Drive | Airway Boulevard to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Hawkins Boulevard to Delta Drive | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (Copperqueen Drive) | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
| Roadway Type/Length(mi) | 2-lane/0.4 | 2-lane/0.6 | 2-lane/0.5 | 2-lane/0.7 | 4-lane/1.2 | 4-lane/1.3 | 4-lane/1.2 | 4-lane/1.4 | 4-lane/1.2 | 4-lane/1.3 | 4-lane/1.4 | 4-lane/0.9 | 4-lane/0.8 | 4-lane/0.8 | 4-lane/1.2 | 4-lane/2.2 |
| Number of drainage crossings (ea) | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 |
| Number of new RR crossings (ea) | 0 | 0 | 1 | 1 | 4 | 4 | 5 | 5 | 7 | 7 | 5 | 5 | 2 | 1 | 5 | 5 |
| Disruption of traffic due to construction (High, Med, Low) | Low | Low | Low | Low | Low | Low | Med | Med | Low | Low | High | Med | Med | Low | Low | Low |
| Disruption of industry operation (High, Med, Low) | Low | Low | Med | Med | High | High | High | High | Med | High | High | Med | Med | Low | High | High |
| Number of high mast utilities impacted (ea) | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 | 11 | 11 | 2 | 0 | 0 | 0 | 9 | 1 |
| Number of above ground utilities impacted (ea) | 2 | 2 | 2 | 2 | 9 | 13 | 14 | 14 | 17 | 17 | 6 | 2 | 2 | 3 | 26 | 11 |
| Number of below ground utilities (LF) X or T (transverse) crossing | GAS-1(30)X | GAS-1(45)X | GAS-3(104)X | GAS-3(118)X | GAS-2(410)X | GAS-2(627)X | ELEC-2(190)X | ELEC-2(190)X | GAS-3(498)X | GAS-3(541)X | ELEC-2(194)X | SAN_SWR-2(196)X | SAN_SWR-2(185)X | GAS-2(181)X | GAS-1(90)X | GAS-3(273)X |
| | SAN_SWR-3(90)X | GAS-1(65)T | SAN_SWR-3(116)X | SAN_SWR-2(86)X | SAN_SWR-1(90)X | WATER-2(223)X | GAS-3(461)X | GAS-3(504)X | SAN_SWR-1(90)X | SAN_SWR-1(395)T | GAS-(203)X | SAN_SWR-1(132)T | WATER-1(92)X | SAN_SWR-1(90)X | GAS-1(3638)T | SAN_SWR-3(285)X |
| | WATER-1(30)X | SAN_SWR-2(60)X | WATER-2(68)X | WATER-2(82)X | WATER-2(185)X | STM_SWR-3(552)X | SAN_SWR-1(90)X | SAN_SWR-1(395)T | SAN_SWR-1(395)T | WATER-2(221)X | SAN_SWR-2(186)X | WATER-1(96)X | STM_SWR-1(92)X | WATER-1(90)X | SAN_SWR-1(90)X | SAN_SWR-2(1802)T |
| | | WATER-1(44)X | | MISC-1(31)X | WATER-1(36)T | STM_SWR-2(998)T | SAN_SWR-1(395)T | WATER-2(224)X | WATER-2(181)X | STM_SWR-2(380)X | SAN_SWR-1(132)T | STM_SWR-1(92)X | | MISC-2(348)X | WATER-1(90)X | WATER-1(90)X |
| | | MISC-1(32)X | | | STM_SWR-1(185)X | MISC-1(92)X | WATER-2(181)X | STM_SWR-1(158)X | STM_SWR-1(320)X | MISC-1(93)X | WATER-2(124)X | | | | STM_SWR-2(4185)T | STM_SWR-2(4015)T |
| | | | | | STM_SWR-2(1019)T | | WATER-1(32)T | STM_SWR-1(51)X | | | STM_SWR-2(189)X | | | | | MISC-1(60)X |
| | | | | | | | STM_SWR-1(157)X | MISC-1(92)X | | | | | | | | |

**Option Carried Forward to Viable Alternatives Analysis**
**Option Eliminated During Fatal Flaw Analysis**


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**Table 5-4 Engineering Analysis (Continued)**

| Features | Industrial Avenue Connection | | Market Avenue Connection | | Delta Drive Connection on West Side of RR | | Delta Drive Connection on East Side of RR | | | | Hawkins Boulevard to North Loop Drive | | | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airway Boulevard to Industrial Avenue | Robert E. Lee to Industrial Avenue | Airway Boulevard to Market Avenue | Robert E. Lee to Market Avenue | Airway Boulevard to Delta Drive on West side of RR | Robert E. Lee to Delta Drive on West Side of RR | Airway Boulevard to Delta Drive on East Side of RR Elevated over North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR Elevated over North Loop Drive | Airway Boulevard to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Hawkins Boulevard to Delta Drive | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (Copperqueen Drive) | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
| **Land area of parks taken (ac)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.2 | 1.2 | 1.5 | 0 | 0 | 0 |
| **Number of tanks impacted** | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **Number of access points (driveways and streets, ea)** | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 7 | 5 | 5 | 2 | 2 | 6 |
| **Other Impacts** | Improvements to Industrial Avenue | Improvements to Industrial Avenue | Improvement to Market Avenue | Improvement to Market Avenue | Relocate fuel facility | Relocate fuel facility | Relocate Phelps-Dodge access gate | Relocate Phelps-Dodge access gate | Relocate fuel facility | Relocate fuel facility | Improvement to Hawkins Boulevard | Improvement to Hawkins Boulevard | Improvement to Hawkins Boulevard | Arroyo crossing | Relocate approximately one mile of RR | Improvement to Hawkins Boulevard |
| | | | | | | | No connection to North Loop Drive | No connection to North Loop Drive | | Severe impact to IH-10 Bridge | Improvements to Delta Drive Bridge approach | | | Modify ponding area | | Impacting approximately 0.65 mi of culvert |
| | | Modify ponding area | Arroyo Crossing | Arroyo Crossing | | | | | | | Modify ponding area | | | Landfill crossing | | Modify ponding area |

**Option Carried Forward to Viable Alternatives Analysis**
**Option Eliminated During Fatal Flaw Analysis**


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**Table 5-5 Environmental Analysis**

| Features | Industrial Avenue Connection | | Market Avenue Connection | | Delta Drive Connection on West Side of RR | | Delta Drive Connection on East Side of RR | | | | Hawkins Boulevard to North Loop Drive | | | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airway Boulevard to Industrial Avenue | Robert E. Lee to Industrial Avenue | Airway Boulevard to Market Avenue | Robert E. Lee to Market Avenue | Airway Boulevard to Delta Drive on West side of RR | Robert E. Lee to Delta Drive on West Side of RR | Airway Boulevard to Delta Drive on East Side of RR Elevated over North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR Elevated over North Loop Drive | Airway Boulevard to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Hawkins Boulevard to Delta Drive | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (Copperqueen Drive) | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
| **Archeological Resources Impacted** | None | None | None | None | None | None | None | None | None | None | None | None | None | Taking of portion of unlisted but eligible historic telecommunications Site 41EP4673 | None | None |
| **Historic Resources Impacted** | None | None | None | None | Impacts to historic industrial properties; NRHP evaluation required if selected | Impacts to historic industrial properties; NRHP evaluation required if selected | Impacts to historic residential/ industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic residential/industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic industrial complex; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic industrial complex; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic residential/ industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic industrial district and 1940's residential neighborhood; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to properties within a 1940's residential neighborhood; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to properties within a 1940's-1950's residential neighborhood; NRHP evaluation required if selected | Impacts to historic residential district; impacts to historic industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | None |
| **Land Use Impacts** | 2 commercial, 0 residential, 0 community facility | 1 commercial, 0 residential, 0 community facility | 2 commercial, 0 residential, 0 community facility | 1 commercial, 0 residential, 0 community facility | 2 commercial, 6 tanks affected, 2 industrial, 0 residential, 0 community facility | 1 commercial, 6 tanks affected, 2 industrial, 0 residential, 0 community facility | 2 commercial, 1 commercial/ industrial adjacent, 1 residential, 0 community facility | 1 commercial, 1 commercial/ industrial adjacent, 1 residential, 0 community facility | 2 commercial, 1 commercial/ industrial adjacent, 0 residential, 0 community facility | 1 commercial, 1 commercial/ industrial adjacent, 0 residential, 0 community facility | 1 baseball diamond (Phelps Dodge), 2-3 residential relocations, 0 community facility, 1 utility adjacent | 1 baseball diamond (Phelps Dodge), 1 commercial adjacent, 0 residential, 1 community facility (Ramona School) opposite | 1 baseball diamond (Phelps Dodge), 1 commercial, 0 residential, 1 community facility (Church of Pentecostal) | 1 landfill, 2 commercial, 1 residential area adjacent, 1 community facility (San Juan Health Center) | 2 commercial, 1-2 residences | 3 commercial, 1 commercial/ industrial |
| **Water resources Impacted** | None | None | None | None | None | None | None | None | None | None | None | None | None | None | None | None |
| **Floodplains Impacted** | None | None | None | None | None | None | None | None | None | None | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area | None | None | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area |

**Option Carried Forward to Viable Alternatives Analysis**
**Option Eliminated During Fatal Flaw Analysis**




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**Table 5-6 Environmental Analysis (Continued)**

| Features | Industrial Avenue Connection | | Market Avenue Connection | | Delta Drive Connection on West Side of RR | | Delta Drive Connection on East Side of RR | | | | Hawkins Boulevard to North Loop Drive | | | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Airway Boulevard to Industrial Avenue | Robert E. Lee to Industrial Avenue | Airway Boulevard to Market Avenue | Robert E. Lee to Market Avenue | Airway Boulevard to Delta Drive on West side of RR | Robert E. Lee to Delta Drive on West Side of RR | Airway Boulevard to Delta Drive on East Side of RR Elevated over North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR Elevated over North Loop Drive | Airway Boulevard to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Robert E. Lee to Delta Drive on East Side of RR with At-grade connection to North Loop Drive | Hawkins Boulevard to Delta Drive | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (Copperqueen Drive) | Airway Boulevard to Marlow Road | Airway Boulevard to Delta Drive with RR Relocation | Airway Boulevard to Hawkins Boulevard (South of Market Avenue) |
| **Socioeconomic and Community Issues** | None | None | None | None | None | None | Possible relocations at north end of Phelps Dodge residential area; Environmental Justice analysis required if selected | Possible relocations at north end of Phelps Dodge residential area; Environmental Justice analysis required if selected | Construction phase disruption near Phelps Dodge residential area | Construction phase disruption near Phelps Dodge residential area | Requires relocations and severs Phelps Dodge residential area; displaces private baseball diamond; Environmental Justice analysis required if selected | Negative effects to residential area and Ramona School (opposite) during construction; displaces private baseball diamond | Negative effects to Church of the Pentecostal and to residential area (opposite) during construction; displaces private baseball diamond | Potential negative effects due to interchange at Marlow Road and Trowbridge Drive; possible displacement of San Juan Health Center; Environmental Justice analysis required if selected | Requires some relocations in north part of Phelps Dodge residential area; Environmental Justice analysis required if selected | None |
| **Ecological Resources Impacted** | None | None | None | None | None | None | None | None | None | None | None | None | None | None | None | None |
| **Noise Impacts** | None | None | None | None | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (no takes) | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (no takes) | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (possible takes north end) | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (possible takes north end) | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (no takes) | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (no takes) | 0-3 impacts located within the Phelps Dodge corporate residential neighborhood (possible takes) | None | One church | Approx. 20 residences, 1 health center | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (possible takes north end) | None |
| **Air Quality Impacts** | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected | None Expected |
| **Hazardous Materials Exposure Number of (Hits)** | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 9 | 9 | 9 | 8 | 26 |

**Option Carried Forward to Viable Alternatives Analysis**
**Option Eliminated During Fatal Flaw Analysis**


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## 5.5 RECOMMENDATION OF VIABLE ALTERNATIVES

Based on the screening process, which included two Stakeholder Meetings and one general public meeting, seven alternatives were recommended for elimination. Due to the number of impacts to utilities, business operation, traffic operation and residences, the seven alternatives were not carried forward. The following table provides a list of alternatives that were carried forward into the next phase of alternative evaluation as the Viable Alternatives.

**Table 5-7 Viable Alternatives**

| Alternative | Brief Description |
|---|---|
| Industrial Avenue Connections | 2-lane connection between Airway Boulevard and Industrial Avenue *(No-Build)* |
| | 2-lane connection between Robert E. Lee and Industrial Avenue |
| Market Avenue Connections | 2-lane connection between Airway Boulevard and Market Avenue |
| | 2-lane connection between Robert E. Lee and Market Avenue |
| Connection to Hawkins Boulevard South of Market Avenue | 4-lane connection between Airway Boulevard and Hawkins Boulevard along with 2-lane connection between Robert E. Lee Airway Boulevard connection |
| Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive | 4-lane connection between Airway Boulevard and Delta Drive as it travels on the east side of the railroad. Provides at-grade connection for North Loop Drive |
| Airway Boulevard to Delta Drive Connection After Relocating Railroad | 4-lane connection along railroad right-of-way between Airway Boulevard and Delta Drive after relocating railroad |
| Hawkins Boulevard Connection to North Loop Drive | 4-lane connection between Hawkins Boulevard and a connection with North Loop Drive located approximately 0.5 mile west of Delta Drive |
| | 4-lane connection between Hawkins Boulevard and North Loop Drive along Copperqueen Drive |

**Figure 5-10** Shows the Viable Alternatives


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**Figure 5-10 Viable Alternatives**


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# 6.0 VIABLE ALTERNATIVES ANALYSIS

The Viable Alternatives were determined through the screening process that included environmental, mobility, and engineering analysis as well as public input. The Conceptual Alternatives were developed through a public involvement process that included input from public officials, business owners, and residences. Through the fatal flaw analysis, the following alternatives were carried forward:

**Table 6-1 Viable Alternatives**

| Alternative | Brief Description |
|---|---|
| Industrial Avenue Connections | 2-lane connection between Airway Boulevard and Industrial Avenue (*No-Build*) |
| | 2-lane connection between Robert E. Lee and Industrial Avenue |
| Market Avenue Connections | 2-lane connection between Airway Boulevard and Market Avenue |
| | 2-lane connection between Robert E. Lee and Market Avenue |
| Connection to Hawkins Boulevard South of Market Avenue | 4-lane connection between Airway Boulevard and Hawkins Boulevard along with 2-lane connection between Robert E. Lee Airway Boulevard connection |
| Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive | 4-lane connection between Airway Boulevard and Delta Drive as it travels on the east side of the railroad. Provides at-grade connection for North Loop Drive |
| Airway Boulevard to Delta Drive Connection After Relocating Railroad | 4-lane connection along railroad right-of-way between Airway Boulevard and Delta Drive after relocating railroad |
| Hawkins Boulevard Connection to North Loop Drive | 4-lane connection between Hawkins Boulevard and a connection with North Loop Drive located approximately 0.5 mile west of Delta Drive |
| | 4-lane connection between Hawkins Boulevard and North Loop Drive along Copperqueen Drive |

## 6.1 EVALUATION OF ELIMINATING TROWBRIDGE DRIVE

Trowbridge Drive is a major four-lane divided arterial that connects IH-10 and North Loop Drive. North Loop Drive is a major six-lane divided arterial that provides east-west movement within the City of El Paso. As Trowbridge Drive provides access for businesses and residences, it serves a variety of purposes. Trowbridge Drive serves


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commuters to downtown, heavy truck traffic from the industrial area east of Marlow Road, and Sun Metro transit traffic. A successful access management plan has been implemented on the north side of Trowbridge Drive that provides separation between residences and the heavily traveled roadway. Marlow Road is a north-south collector street that marks the end of the residential area along Trowbridge Drive. The distance between the interchange of IH-10/Trowbridge Drive and Marlow Road is approximately 0.75 of a mile. The area east of Marlow Road is completely industrial as it is primarily owned by Chevron-Texaco, Western Refining, and Phelps-Dodge Mining Company. This industrial area along Trowbridge Drive between Marlow Road and Delta Drive is approximately one mile in length. North Loop Drive begins east of Delta Drive.

Closing Trowbridge Drive between Marlow Road and Delta Drive puts a strain on other roadways within the area as well as disrupts traffic flow and transit routes. Closing Trowbridge Drive between Marlow Road and Delta Drive would force the majority of traffic to move to Alameda Avenue. It is expected that approximately 50% of the vehicles per day on Trowbridge Drive, between Marlow Road and Delta Drive, would shift to Alameda Avenue. Given that approximately 25,000 vehicles per day are projected to drive along this section of Trowbridge Drive in the future, according to the Metropolitan Planning Organization Model, it is expected that well nearly two lanes of traffic would be added to Alameda Avenue.

Alameda Avenue is currently a four-lane divided roadway that provides access to business, street parking, transit routes, and a number of cross streets with signalized intersections. The businesses along Alameda Avenue are very close to the street, typically separated only by the width of a sidewalk. The possibility of widening Alameda Avenue would be challenging based on the number of businesses that would be impacted. The projected traffic along Alameda Avenue, according to the MPO model is very close to the capacity of a four-lane roadway. If Trowbridge Drive was closed between Marlow Road and Delta Drive, it is expected that the majority of traffic would be added to Alameda Avenue. The addition of this traffic would cause the volume on Alameda Avenue to greatly exceed capacity. It is projected that if this additional volume is forced onto Alameda Avenue, then this roadway will exceed capacity for a four-lane roadway by a minimum of 20%.

The remaining traffic from Trowbridge Drive would divert to IH-10. During certain periods of the day, IH-10 between Trowbridge Drive and Airway Boulevard is congested. Additional traffic that would be rerouted if Trowbridge Drive was closed would result in decreasing traffic conditions. Trowbridge Drive also serves as an alternate route to IH-10 when overloaded. If Trowbridge Drive was not available then drivers would not have the option of this alternate route.

Additional traffic would also be accounted for on Clark Drive and Delta Drive.
The volume on these two north-south roadways would increase because they provide passage to drivers who desire to go to the open section of Trowbridge Drive or North Loop Drive. The increase in volume to Clark Drive is projected to be minimal while the Delta Drive Bridge volume would increase by approximately 18%. The effects of closing Trowbridge Drive on IH-10 are not expected to be significant.


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Closing Trowbridge Drive would also have a severe impact on transit routes. Currently, Trowbridge Drive provides passage for Sun Metro buses. Finally, closing this section of Trowbridge Drive would impact the connectivity of North Loop Drive to IH-10 as well as the ability for residents along Trowbridge Drive to travel to/from the east.

It is recognized that the purpose of closing Trowbridge Drive between Marlow Road and Delta Drive was initiated by Western Refining. The purpose for Western Refining to close this portion of Trowbridge Drive was to minimize security risks to the refinery and surrounding neighborhoods. From a security perspective, closing Trowbridge Drive would minimize exposure to Western Refining. However, the purpose of this report was to focus on the transportation issues. Therefore, from a transportation perspective it is recommended that Trowbridge Drive remain open.

## 6.2 EVALUATION OF RELOCATING THE RAILROAD

As described in Chapter 3, the Union Pacific Railroad operates approximately 1.4 miles of single track in the study corridor. The rail line follows Robert E. Lee into the study area and then provides an at-grade crossing at North Loop Drive prior to entering the rail yard. This line is fed by the Union Pacific rail yard which is located between North Loop Drive and Alameda Avenue. The railroad line serves Fort Bliss. Any alternative located along the railroad line results in a high level of utility impacts. Therefore, the possibility of relocating the existing railroad line was analyzed. Given the location of the rail yard and that there is approximately 1.5 miles of spur track that serves Western Refining, Phelps-Dodge, and the industrial area near Hawkins Boulevard, it was determined any relocation of the rail line would need to occur in the immediate area.

Four railroad relocation options were developed as shown in **Figures 6-1 through 6-4**. All of these options assume that Trowbridge Drive would be closed in order to provide the benefit of eliminating an at-grade railroad crossing at North Loop Drive. However, as discussed in the previous section, closing Trowbridge Drive was not determined to be a feasible option. Also, as seen in the following figures, all of the options travel through Western Refining property and as a result would cause heavy impacts to refinery operations. Therefore, the options shown in the following figures were eliminated. Additionally, any option that assumed the railroad was to be relocated was also eliminated.


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**Figure 6-1 Railroad Relocation Option 1**


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**Figure 6-2 Railroad Relocation Option 2**


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**Figure 6-3 Railroad Relocation Option 3**


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**Figure 6-4 Railroad Relocation Option 4**


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## 6.3 PHASED EVALUATION

Several transportation alternatives with varying degrees of impacts and benefits were carried forward to the evaluation phase. Phase 1 alternatives were projected to result in the lowest impacts and cost with some benefit to the transportation system. These alternatives are expected to be built in a shorter time frame. Phases 2 and 3 would result in increasing impacts along with greater benefits to mobility. With the increasing level of impacts for Phase 2 and 3 alternatives, it is expected that the construction time frame would be longer. The alternatives were divided into the following three phases in order to perform the evaluation:

**Table 6-2 Phased Alternatives**

| Phase | Alternative | Brief Description |
|---|---|---|
| Phase 1 | Industrial Avenue Connections | 2-lane connection between Airway Boulevard and Industrial Avenue (*No-Build*) |
| | | 2-lane connection between Robert E. Lee and Industrial Avenue |
| | Market Avenue Connections | 2-lane connection between Airway Boulevard and Market Avenue |
| | | 2-lane connection between Robert E. Lee and Market Avenue |
| Phase 2 | Hawkins Boulevard Connection to North Loop Drive | 4-lane connection between Hawkins Boulevard and a connection with North Loop Drive located approximately 0.5 mile west of Delta Drive |
| | | 4-lane connection between Hawkins Boulevard and North Loop Drive along Copperqueen Drive |
| Phase 3 | Connection to Hawkins Boulevard South of Market Avenue | 4-lane connection between Airway Boulevard and Hawkins Boulevard along with 2-lane connection between Robert E. Lee Airway Boulevard connection |
| | Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive | 4-lane connection between Airway Boulevard and Delta Drive as it travels on the east side of the railroad. Provides at-grade connection for North Loop Drive |
| | Airway Boulevard to Delta Drive Connection After Relocating Railroad | 4-lane connection along railroad right-of-way between Airway Boulevard and Delta Drive after relocating railroad. **(Eliminated because it was determined that relocating the railroad was not feasible.)** |


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**Figure 6-5 Phase 1 Alternatives**


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**Figure 6-6 Phase 2 Alternatives**


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**Figure 6-7 Phase 3 Alternatives**


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### 6.3.1 Phase 1 Evaluation

Phase 1, as shown in **Figure 6-5**, consisted of alternatives that would result in the lowest impacts and cost with some benefit to the transportation system. The purpose of the Phase 1 alternatives was to improve mobility along Hawkins Boulevard by reducing the truck trips between the industrial park located on the northeast quadrant of the study and IH-10. The alternatives between Robert E. Lee or Airway Boulevard and the industrial park would provide an alternate route to Hawkins Boulevard in accessing IH-10. The two street connections analyzed within the industrial park were Industrial Avenue and Market Avenue. The typical section used for these alternatives is shown in **Figure 6-8**.

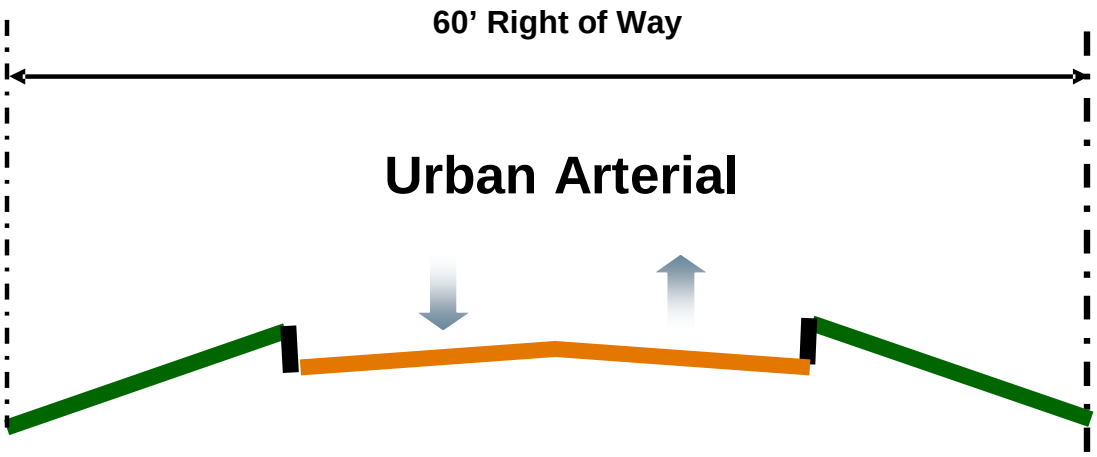


**Figure 6-8 Phase 1 Typical Section**

The following sections show the evaluation of each alternative based on the determined goals. **Tables 6-3** through **6-5** are detailed matrices of all of the major issues identified with each of the Phase 1 alternatives.


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**Table 6-3 Phase 1 Evaluation**

| Features | Industrial Avenue Connection | | Market Avenue Connection | |
|---|---|---|---|---|
| | BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)* | Robert E. Lee to Industrial Avenue | Airway Boulevard to Market Avenue | Robert E. Lee to Market Avenue |
| **Minimize Truck Traffic in Residential Areas** | | | | |
| **Number of trucks in residential area along Trowbridge Drive and Delta Drive** | No change | No change | No change | No change |
| **Designate hazardous cargo route** | No | No | No | No |
| | | | | |
| **Improve North-South Mobility** | | | | |
| **Travel Time and Percent Difference for the following Origins and Destinations** | | | | |
| Alameda Avenue to El Paso International Airport (minutes) | 15.16 | 14.71 | 15.44 | 14.62 |
| Alameda Avenue to El Paso International Airport (percent change) | 0.00% | 2.97% | -1.85% | 3.56% |
| Alameda Avenue to Downtown (minutes) | 27.45 | 26.39 | 28.05 | 26.23 |
| Alameda Avenue to Downtown (percent change) | 0.00% | 3.86% | -2.19% | 4.44% |
| Border Crossing to El Paso International Airport(minutes) | 32.83 | 32.89 | 33.1 | 32.79 |
| Border Crossing to El Paso International Airport (percent change) | 0.00% | -0.18% | -0.82% | 0.12% |
| Border Crossing to Downtown (minutes) | 45.12 | 44.57 | 45.72 | 44.4 |
| Border Crossing to Downtown (percent change) | 0.00% | 1.22% | -1.33% | 1.60% |
| **Volume to Capacity** | | | | |
| Trowbridge Drive | 0.95 | 0.93 | 0.96 | 0.94 |
| Delta Drive | 1.23 | 1.25 | 1.28 | 1.14 |
| Alameda Avenue | 0.67 | 0.66 | 0.68 | 0.69 |
| North Loop Drive | 1.06 | 1.06 | 1.06 | 0.97 |
| Hawkins Boulevard | 0.77 | 0.77 | 0.7 | 0.75 |
| Alternative | 0.6 | 0.63 | 0.55 | 0.67 |
| **Direct Ramp Access to IH-10** | Yes | No | Yes | No |
| **Ability of Current Interchange Configuration at IH-10 to handle future traffic** | Good | Poor | Good | Poor |
| **Decrease Truck Traffic Along Hawkins Boulevard** | Yes | Yes | Yes | Yes |
| | | | | |
| **Minimize Industrial Area Exposure/Impacts** | | | | |
| **Number of tanks impacted (ea)** | 0 | 0 | 0 | 0 |
| **Impact to Industry Operation** | Low | Low | Low | Low |
| **Number of additional roadways fronting refinery company property** | 1 | 1 | 1 | 1 |
| **Number of additional roadways fronting mining company property** | 1 | 1 | 1 | 1 |


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**Table 6-4 Phase 1 Evaluation (continued)**

| Features | Industrial Avenue Connection | | Market Avenue Connection | |
|---|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Robert E. Lee to Industrial Avenue** | **Airway Boulevard to Market Avenue** | **Robert E. Lee to Market Avenue** |
| **Construct Road for a Reasonable Cost** | | | | |
| **Number of utility impacts** | | | | |
| Number of high mast utilities impacted (ea) | 0 | 0 | 0 | 0 |
| Number of above ground utilities(other than high mast utility towers) (ea) | 2 | 2 | 2 | 2 |
| Number of below ground utilities impacted: Utility-ea(LF)(X-crossing or T-traverse)* | GAS-1(30)X | GAS-1(45)X | GAS-3(104)X | GAS-3(118)X |
| | SAN_SWR-3(90)X | GAS-1(65)T | SAN_SWR-3(116)X | SAN_SWR-2(86)X |
| | WATER-1(30)X | SAN_SWR-2(60)X | WATER-2(68)X | WATER-2(82)X |
| | | WATER-1(44)X | | MISC-1(31)X |
| | | MISC-1(32)X | | |
| | | | | |
| **Number of buildings impacted** | 0 | 0 | 2 | 2 |
| **Disruption of Traffic During Construction** | Low | Med | Low | Med |
| **Total Cost** | $2.0 Million | $2.5 Million | $2.6 Million | $3.2 Million |
| **Avoid Railroad Impacts/Crossings** | | | | |
| **Impacts to Railroad Mainline** | No | No | No | No |
| **Number of new spur railroad crossings (ea)** | 0 | 0 | 0 | 0 |


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**Table 6-5 Phase 1 Evaluation (continued)**

| Features | Industrial Avenue Connection | | Market Avenue Connection | |
|---|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Robert E. Lee to Industrial Avenue** | **Airway Boulevard to Market Avenue** | **Robert E. Lee to Market Avenue** |
| **Limit Environmental/Social Impacts** | | | | |
| Archeological Resources Impacted | None | None | None | None |
| Historic Resources Impacted | None | None | None | None |
| Land Use Impacts | 2 commercial, 0 residential, 0 community facility | 2 commercial, 0 residential, 0 community facility | 2 commercial, 0 residential, 0 community facility | 2 commercial, 0 residential, 0 community facility |
| Water resources Impacted | None | None | None | None |
| Floodplains Impacted | None | None | None | None |
| Socioeconomic and Community Issues | None | None | None | None |
| Ecological Resources Impacted | None | None | None | None |
| Noise Impacts | None | None | None | None |
| Air Quality Impacts | None Expected | None Expected | None Expected | None Expected |
| Hazardous Materials | | | | |
| Hazardous Materials (HazRank 1 = Least potential sites for hazardous exposure, HazRank 4 = most potential sites for hazardous expsure) | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. |
| Number of sites in proximity to alignment that has had reported releases and/or contamination | 6 | 6 | 6 | 6 |
| Number of sites in proximity to alignment that has had violations | 3 | 3 | 3 | 3 |


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#### 6.3.1.1 Improve North-South Mobility

As the purpose of the Phase 1 alternatives was to reduce the trucks that were traveling along Hawkins Boulevard to IH-10. The mobility of these options was evaluated using the following factors:

- Decrease truck traffic along Hawkins Boulevard
- Improving travel time
- Access to IH-10
- Effects of Airway Boulevard/Robert E. Lee Interchanges

All of the Phase 1 options are expected to decrease truck traffic to IH-10 along Hawkins Boulevard by providing an alternate route. However, the alternatives from Airway Boulevard are expected to have a larger effect on the reduction of truck traffic along Hawkins Boulevard because there is ramp access directly from Airway Boulevard to IH-10. In order to access IH-10 from Robert E. Lee, it is necessary to travel through Geronimo Drive or Airway Boulevard. As truck drivers will seek the fastest route to IH-10, it is expected that more trucks would use the connection from Airway Boulevard to the industrial park.

When determining travel time for these alternatives, the following four routes were used:

- Border Crossing to Downtown
- Border Crossing to El Paso International Airport
- Alameda Avenue to Downtown
- Alameda Avenue to El Paso International Airport

The travel time improvements for drivers for each of the Phase 1 alternatives are projected to be similar. As previously mentioned, the Robert E. Lee options would not provide direct access to IH-10.

The effect of the alternatives to the interchanges of Airway Boulevard or Robert E. Lee and IH-10 was reviewed. Based on traffic projections from the El Paso MPO transportation model, the Phase 1 alternatives would carry approximately 12,000 vehicles per day in year 2030. The interchange at Airway Boulevard and IH-10 would require improvements to turning movements to/from IH-10. These capacity improvements could be performed through signal timing and/or additional turn lanes. This study did not go into the detail of providing specific interchange improvements.

The improvements for the Robert E. Lee/IH-10 interchange are expected to be much more substantial. The current configuration of this interchange has the railroad line splitting Robert E. Lee as it crosses under IH-10 and with two-way roadways on each side of the railroad. The existing interchange can cause driver confusion. The Robert E. Lee connections would add traffic to an intersection that operates poorly.


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#### 6.3.1.2 Minimize Truck Traffic in Residential Neighborhoods

While truck traffic is expected to be reduced near the Hawkins Boulevard/IH-10 interchange, the Phase 1 alternatives are not expected to reduce truck traffic in residential neighborhoods significantly.

#### 6.3.1.3 Minimize Exposure to Industrial Area

The exposure to the industrial area was evaluated with the following parameters:

- Number of tanks impacted
- Impact to operational areas
- Number of additional roadways fronting the refinery
- Number of additional roadways fronting the mining company

The exposure of all of these alternatives was relatively low. None of the alternatives resulted in impacts to tanks or operational areas. The number of additional roadways that would front the industrial areas would be one.

#### 6.3.1.4 Construct Roadway for a Reasonable Cost

The cost for the Phase 1 options took utility relocations and construction cost into account. However, environmental clean-up was not included in this cost because it was not possible to determine the necessary environmental remediation at this stage. Given that the study area is within an industrial area that has been in operation for well over 50 years, it is reasonable to assume that environmental costs could be significant. The water and sewer utility impact costs were provided by the El Paso Water Utilities while El Paso Electric aided in determining the costs for electric line relocations. A review of existing conditions showed that water, sewer, and gas lines would be impacted for each of the Phase 1 alternatives. Two above ground electric poles would be impacted while none of the high mast utility lines would need to be relocated. The construction cost was based on the typical section shown in **Figure 6-8**. Total costs for each option is shown in the previous matrices. The estimated costs ranged from $2.0 million to $3.2 million with the Airway Boulevard to Industrial Avenue being the least expensive and Robert E. Lee to Market Avenue resulting in the most expensive Phase 1 alternative.

Cost was also determined by constructability. As mentioned in a previous section, the Robert E. Lee connections would result in a more complicated design given the current configuration at IH-10. While the Airway Boulevard/IH-10 interchange would require improvements, the design is projected to be less complicated than the Robert E. Lee connections.

#### 6.3.1.5 Avoid Railroad Impacts/Crossings

In order to minimize impacts to the railroad and provide a safe driving environment, the number of railroad impacts and number of spur lines crossing the new roadway was determined. The Phase 1 alternatives are expected to result in minimal impacts to the railroad and no at-grade spur crossings.


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#### 6.3.1.6 Limit Environmental/Social Impacts

As shown in the previous matrices, a number of environmental elements were evaluated for each alternative. The majority of environmental issues analyzed were not a factor for each of the alternatives. The two issues for the Phase 1 alternatives were land use and hazardous materials. The Robert E. Lee and Airway Boulevard connections are expected to impact two businesses. The major environmental concern for this phase is the hazardous materials. As the study area is completely industrial with oil and mining operations that have taken place for well over 50 years, it is reasonable to assume that significant environmental clean up would need to occur. From the record search, it was determined that six properties have reported releases or contamination that are in proximity to each of the alternatives. A more detailed investigation into soil conditions would be required to determine the necessary environmental mitigation.

### 6.3.2 Phase 1 Recommendations

Based on the evaluation of Phase 1 alternatives, which included input from the Stakeholder Committee and general public, the two-lane connector between Airway Boulevard and Market Avenue was recommended.

With direct access to IH-10 and fewer constructability issues than Robert E. Lee it was determined that a connection to Airway Boulevard was preferred. The connection to Market Avenue was preferred over Industrial Avenue due to the existing configuration. Industrial Avenue provides very little set back distance between businesses and the roadway so that on-street parking is necessary for trucks. However, businesses along Market Avenue are given generous areas between buildings and the roadway for truck parking or loading areas. Therefore, Market Avenue was a more desirable connection to the industrial park.

As part of the City's planned expansion of Hawkins Boulevard to six lanes, an access management plan would be developed. Currently, Hawkins Boulevard is a four-lane roadway south of IH-10 near the industrial park with numerous driveways and no turn lanes at the intersections of Commerce Street, Industrial Avenue, or Market Avenue. Commerce Street is a signalized intersection located approximately 500 feet south of IH-10. Industrial Avenue provides another signalized intersection at Hawkins Boulevard less than 300 feet south of Commerce with a traffic signal at Market Avenue nearly 300 feet farther downstream. With the number of driveways, lack of turn lanes and short signal spacing, Hawkins Boulevard is often congested. A corridor access management plan along Hawkins Boulevard would recommend potential areas of driveway consolidation, signal timing improvements, and intersection geometry improvements. It has been estimated in past studies that a successful corridor access management plan could increase capacity by approximately 15%. With this corridor access management plan implemented and Hawkins Boulevard upgraded to six lanes as planned, it is projected that congestion would be alleviated significantly.

Any proposed roadway within this study area would require extensive environmental documentation and remediation. While the analysis for this study took environmental


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factors into account in finalizing the recommendations, it would be necessary to perform more detailed environmental studies in order to determine necessary remediation and clean up.

**Figure 6-9** shows the Phase 1 recommendations. **Figures 6-10** through **6-12** provide conceptual drawings for the connection between Airway Boulevard and Market Avenue. **Figure 6-10** shows the connection at IH-10. This drawing shows a four lane section between IH-10 and the connection to C&R Trucking Company. The roadway connecting to C&R Trucking Company was moved approximately 250 feet from the existing location in order to minimize any negative operational and safety impacts to the IH-10 interchange. The existing location is located less than 100 feet south of IH-10. **Figure 6-11** shows the section of the new roadway as it connects to Market Avenue while **Figure 6-12** shows the connection to Hawkins Boulevard.


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**Figure 6-9 Phase 1 Recommendations**


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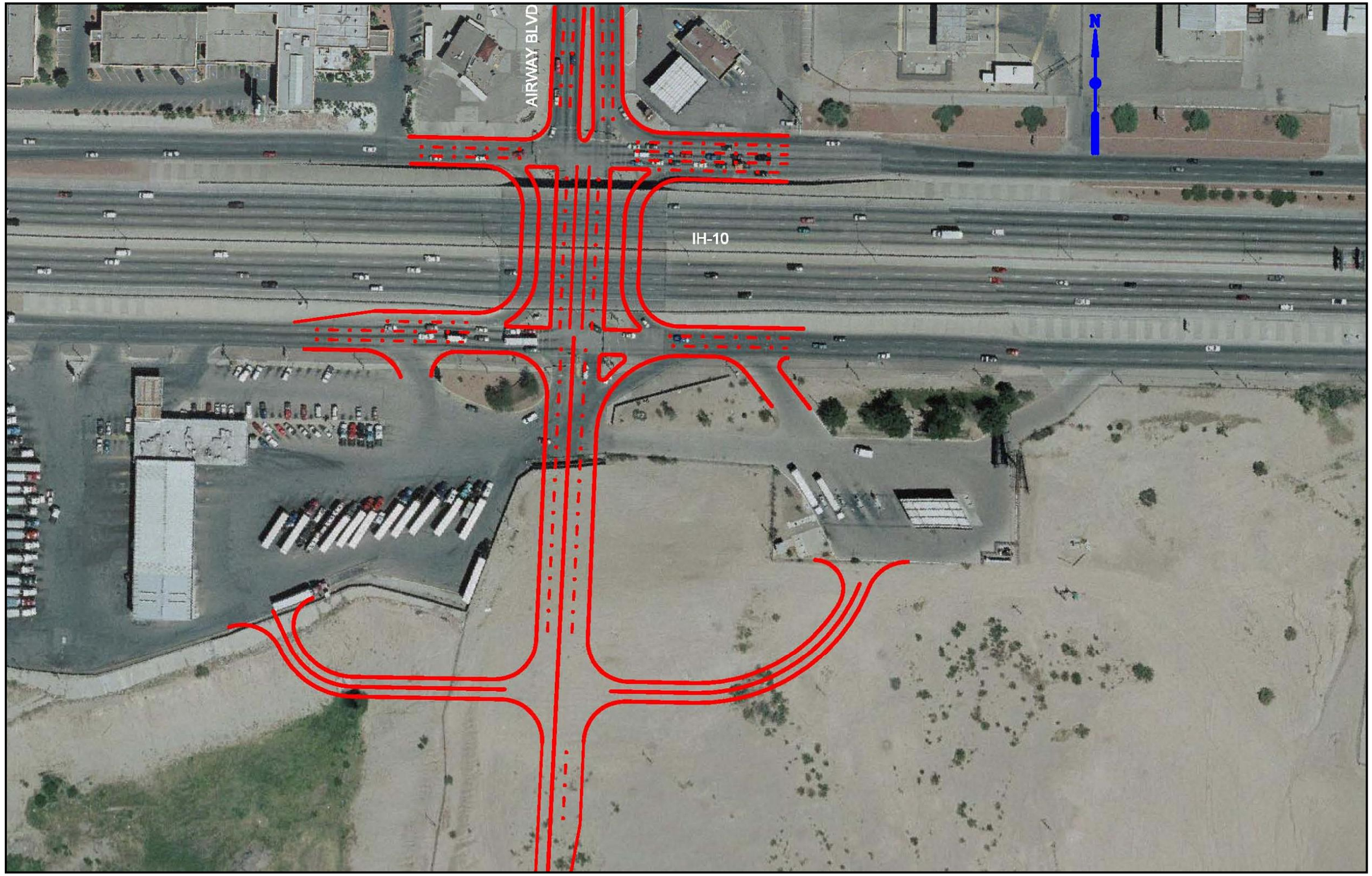


**Figure 6-10 Phase 1 Recommendation – Section 1**


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**Figure 6-11 Phase 1 Recommendation – Section 2**


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**Figure 6-12 Phase 1 Recommendation – Section 3**


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### 6.3.3 Phase 2 Evaluation

Phase 2, as shown in **Figure 6-6**, consisted of alternatives that would result in minor travel time benefits along with higher impacts and costs. The two alternatives analyzed in this phase provided a more direct connection between Hawkins Boulevard and North Loop Drive. One of the alternatives provided a connection west of Copperqueen Drive while the other Phase 2 alternative showed the new roadway utilizing the existing Copperqueen Drive alignment. The typical section used for these alternatives is shown in **Figure 6-10**.

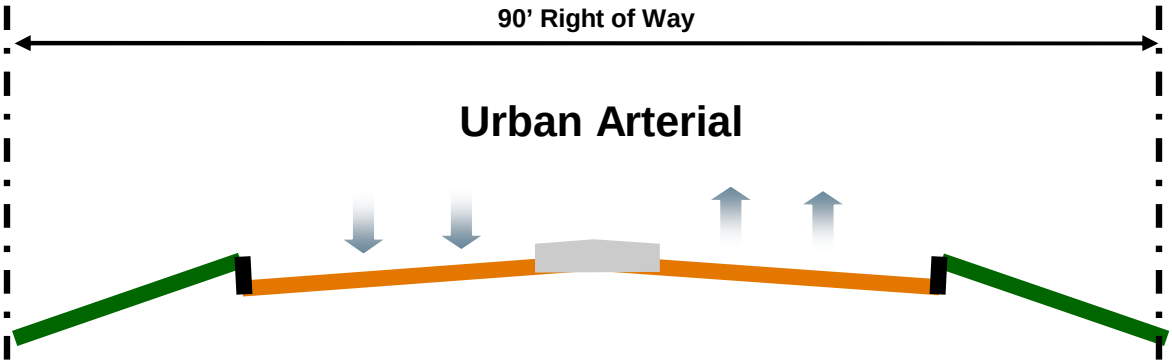


**Figure 6-13 Phase 2 Typical Section**

The following sections show the evaluation of each alternative based on the determined goals. **Tables 6-6** through **6-9** are detailed matrices of all of the major issues identified with each of the Phase 2 alternatives.


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**Table 6-6 Phase 2 Evaluation**

| Features | | Hawkins Boulevard to North Loop Drive | |
|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Hawkins Boulevard to North Loop Drive (West Connection)** | **Hawkins Boulevard to North Loop Drive (East Connection)** |
| **Minimize Truck Traffic in Residential Areas** | | | |
| **Number of trucks in residential area along Trowbridge Drive and Delta Drive** | No change | Minor Change | Minor Change |
| **Designate hazardous cargo route** | No | No | No |
| | | | |
| **Improve North-South Mobility** | | | |
| **Travel Time and Percent Difference for the following Origins and Destinations** | | | |
| Alameda Avenue to El Paso International Airport (minutes) | 15.16 | 12.75 | 13.49 |
| Alameda Avenue to El Paso International Airport (percent change) | 0.00% | 15.90% | 11.02% |
| Alameda Avenue to Downtown (minutes) | 27.45 | 25.26 | 25.7 |
| Alameda Avenue to Downtown (percent change) | 0.00% | 7.98% | 6.38% |
| Border Crossing to El Paso International Airport(minutes) | 32.83 | 30.57 | 31.72 |
| Border Crossing to El Paso International Airport (percent change) | 0.00% | 6.88% | 3.38% |
| Border Crossing to Downtown (minutes) | 45.12 | 43.08 | 43.92 |
| Border Crossing to Downtown (percent change) | 0.00% | 4.52% | 2.66% |
| | | | |
| **Volume to Capacity** | | | |
| Trowbridge Drive | 0.95 | 0.98 | 1.06 |
| Delta Drive | 1.23 | 1.41 | 1.24 |
| Alameda Avenue | 0.67 | 0.65 | 0.63 |
| North Loop Drive | 1.06 | 0.99 | 1.05 |
| Hawkins Boulevard | 0.77 | 0.82 | 0.84 |
| Alternative | 0.6 | 0.69 | 0.79 |
| **Decrease Volume Along Hawkins Boulevard** | N/a | No | No |
| | | | |
| **Minimize Industrial Area Exposure/Impacts** | | | |
| **Number of tanks impacted (ea)** | 0 | 0 | 0 |
| **Impact to Industry Operation** | Low | Low | Low |
| **Number of additional roadways fronting refinery company property** | 1 | 0 | 0 |
| **Number of additional roadways fronting mining company property** | 1 | 1 | 1 |


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**Table 6-7 Phase 2 Evaluation (continued)**

| Features | | Hawkins Boulevard to North Loop Drive | |
|---|---|---|---|
| | BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)* | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (East Connection) |
| **Construct Road for a Reasonable Cost** | | | |
| **Number of utility impacts** | | | |
| Number of high mast utilities impacted (ea) | 0 | 0 | 0 |
| Number of above ground utilities(other than high mast utility towers) (ea) | 2 | 2 | 2 |
| Number of below ground utilities impacted: Utility-ea(LF) (X-crossing or T-traverse)* | GAS-1(30)X | SAN_SWR-2(196)X | SAN_SWR-2(185)X |
| | SAN_SWR-3(90)X | SAN_SWR-1(132)T | WATER-1(92)X |
| | WATER-1(30)X | WATER-1(96)X | STM_SWR-1(92)X |
| | | STM_SWR-1(92)X | |
| | | | |
| | | | |
| | | | |
| **Number of buildings impacted** | 0 | 0 | 0 |
| **Disruption of Traffic During Construction** | Low | Low | Low |
| **Total Cost** | $2.0 Million | $6.2 Million | $ 5.5 Million |
| **Avoid Railroad Impacts/Crossings** | | | |
| **Impacts to Railroad Mainline** | No | No | No |
| **Number of relocated spur crossings due to new roadway** | 0 | 0 | 0 |
| **Number of spur railroad crossings (ea)** | 0 | 1 | 1 |


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**Table 6-8 Phase 2 Evaluation (continued)**

| Features | | Hawkins Boulevard to North Loop Drive | |
|---|---|---|---|
| | BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)* | Hawkins Boulevard to North Loop Drive (West Connection) | Hawkins Boulevard to North Loop Drive (East Connection) |
| **Limit Environmental/Social Impacts** | | | |
| **Archeological Resources Impacted** | None | None | None |
| **Historic Resources Impacted** | None | Impacts to historic industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | Impacts to historic industrial district; possible contributing resources to listed NRHP district; NRHP evaluation required if selected |
| **Land Use Impacts** | 2 commercial, 0 residential, 0 community facility | 1 landfill, 1 baseball diamond (Phelps Dodge), 1 railroad crossing/intersection, 1 commercial adjacent, 0 residential, 1 community facility (Ramona School) opposite | 1 landfill, 1 baseball diamond (Phelps Dodge), 1 railroad crossing/intersection, 1 commercial, 0 residential, 1 community facility (Church of Pentecostal) |
| **Water resources Impacted** | None | Ponding area located approximately 500 feet north of connection to North Loop Drive | None expected |
| **Floodplains Impacted** | None | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area |
| **Socioeconomic and Community Issues** | None | Negative effects to residential area and Ramona School (opposite) during construction; displaces private baseball diamond | Negative effects to Church of the Pentecostal and to residential area (opposite) during construction; displaces private baseball diamond |
| **Ecological Resources Impacted** | None | None | None |
| **Noise Impacts** | None | None | One church |
| **Air Quality Impacts** | None Expected | None Expected | None Expected |


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**Table 6-9 Phase 2 Evaluation (continued)**

| Features | | Hawkins Boulevard to North Loop Drive | |
|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Hawkins Boulevard to North Loop Drive (West Connection)** | **Hawkins Boulevard to North Loop Drive (East Connection)** |
| **Limit Environmental/Social Impacts** | | | |
| **Hazardous Materials** | | | |
| Hazardous Materials (HazRank 1 = Least potential sites for hazardous exposure, HazRank 4 = most potential sites for hazardous expsure) | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 1** Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. |
| Number of sites in proximity to alignment that has had reported releases and/or contamination | 6 | 6 | 6 |
| Number of sites in proximity to alignment that has had violations | 3 | 3 | 3 |


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#### 6.3.3.1 Improve North-South Mobility

The purpose of the Phase 2 alternatives was to provide improved travel time between North Loop Drive and IH-10. The following mobility factors were evaluated for these alternatives:

- Travel time
- Effects of Hawkins Boulevard

The travel time evaluation for these alternatives utilized the same origins/destinations as shown in Phase 1. Each of the alternatives was compared to the baseline case that is already shown in the El Paso MPO plan. The travel time improvements for each of the Phase 2 alternatives are projected to be similar, between 10% and 15%. This is attributed to the fact that these alternatives would provide a straight path instead of the existing circuitous route Hawkins Boulevard follows. However, the both alternatives would increase the traffic volumes on Hawkins Boulevard.

It was necessary to evaluate the effect these alternatives would have on Hawkins Boulevard as the projected traffic volumes from the El Paso MPO transportation model was approximately 24,000 vehicles per day in 2030. This volume represents the added traffic to Hawkins Boulevard in both directions. The improvements recommended in Phase 1 along Hawkins Boulevard would be necessary prior to the implementation of either Phase 2 alternative. As shown in **Table 6-6**, the change in volume to capacity ratio for Hawkins Boulevard between the No-Build and the Phase 2 alternatives is minimal. However, it is shown that both alternatives negatively affect the volume to capacity ratio along Hawkins Boulevard and result in additional volume.

Through comparing the two Phase 2 alignments, the advantage to the alternative connecting to Copperqueen Drive is that it provides access to businesses along this roadway.

#### 6.3.3.2 Minimize Truck Traffic in Residential Neighborhoods

While truck traffic is expected to be reduced near the Hawkins Boulevard/IH-10 interchange from Phase 1 improvements, the Phase 2 alternatives are not expected to reduce truck traffic in residential neighborhoods significantly.

#### 6.3.3.3 Minimize Exposure to Industrial Area

As in Phase 1, the exposure to the industrial area was evaluated with the following parameters:

- Number of tanks impacted
- Impact to operational areas
- Number of additional roadways fronting the refinery
- Number of additional roadways fronting the mining company


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The exposure of all of these alternatives was relatively low. None of the alternatives resulted in impacts to tanks or operational areas. While the exposure to Phelps-Dodge property would be higher, the majority of their operation is west of the Phase 2 alternatives. Therefore, the impact to industry operation was considered low. The number of additional roadways that would front the refinery would be none while the mining company would be exposed to one additional roadway.

#### 6.3.3.4 Construct Roadway for a Reasonable Cost

The cost for the Phase 2 options took utility relocations and construction cost into account. However, as in the previous phase environmental clean-up was not included in this cost because it was not possible to determine the necessary environmental remediation at this stage. It is reasonable to assume that environmental costs could be significant given the age and type of operation within the industrial area. The water and sewer utility impact costs were provided by the El Paso Water Utilities while El Paso Electric aided in determining the costs for electric line relocations. A review of existing conditions showed that water, sewer, and gas lines would be impacted for each of the Phase 2 alternatives. The impacts would be similar for both alternatives. Two above ground electric poles would be impacted while none of the high mast utility lines would need to be relocated.

The construction cost was based on the typical section shown in **Figure 6-10**. Total costs for each option of Phase 2 is shown in the previous matrices. The estimated costs for the west connection was $6.2 million while the alternative along Copperqueen Drive was estimated as $5.5 million. Both alternatives included a structure cost for the bridge that would be required to cross the railroad spur located south of the athletic field.

#### 6.3.3.5 Avoid Railroad Impacts/Crossings

In order to minimize impacts to the railroad and provide a safe driving environment, the number of railroad impacts and spur lines crossing the new roadway was determined. The existing section of Hawkins Boulevard between IH-10 and the connection to the Phase 2 alternatives contains two at-grade railroad crossings. The Phase 2 alternatives cross an existing railroad spur located south of the athletic field on structure.

#### 6.3.3.6 Limit Environmental/Social Impacts

As shown in the previous matrices, a number of environmental elements were evaluated for each alternative. The historical resources analysis revealed that either alternative would result in a NRHP evaluation. Phelps-Dodge has been in existence a length of time that would result in performing this evaluation. In terms of land use impacts, both alternatives impact the athletic field. As the athletic field is privately owned by Phelps-Dodge it is not expected to result in a Section 4(f) evaluation. An existing landfill is located approximately 300 feet south of the railroad spur alignment. The size of the landfill is approximately 60,000 square feet. While both of the alignments travel close to the landfill, they do not touch the landfill boundary. Due to the location of the landfill and type of


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operation that occurs within the industrial area further study is required to determine the soil conditions. The hazardous material database search revealed that six properties within the proximity of both Phase 2 alignments have been sited for releases or contamination while three have had violations. The alternative with the western connection would cross an existing ponding area located approximately 500 feet north of the proposed connection to North Loop Drive.

### 6.3.4 Phase 2 Recommendations

Both of the Phase 2 alternatives were projected to result in minimal travel time savings between North Loop Drive and Hawkins Boulevard. Additionally, neither of the Phase 2 improvements would significantly minimize truck traffic on Hawkins Boulevard or other roadways. The impacts to utilities, railroad, industrial area, and to the environment are expected to be similar for both Phase 2 alternatives. Significant environmental issues are expected to exist, given the nature of the industrial area and its age. With any new roadway within this study area, extensive environmental documentation, and remediation would be required. While the analysis for this study took environmental factors into account in finalizing the recommendations, it would be necessary to perform more detailed environmental studies in order to determine necessary remediation and clean up.

Based on the evaluation of Phase 2 alternatives, which included input from the Stakeholder Committee and general public, **the recommendation was to eliminate both options for future consideration**. Due to the City's desire to minimize right-of-way impacts, the lack of benefit to Hawkins Boulevard, uncertainty of environmental issues, and failure to reduce truck traffic on roadways, it was recommended that both four-lane alternatives between the western bend of Hawkins Boulevard and North Loop Drive be eliminated. The benefit of these alternatives did not greatly outweigh the costs.


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### 6.3.5 Phase 3 Evaluation

The third phase of this project provides alternatives that would result in much higher impacts to utilities, environment, and the industrial area. It is expected that due to these impacts, the construction time would be much longer along with a higher cost. However, these alternatives are also projected to result in the highest benefits to mobility within the area. Phase 3, as shown in **Figure 6-7**, consisted of two alternatives. One alternative provides a four-lane connection from Airway Boulevard to Hawkins Boulevard with the proposed roadway following the existing drainage structure located south of Market Avenue. This alternative also proposes a two-lane connection from Robert E. Lee to the new roadway connecting Airway Boulevard to Hawkins Boulevard. The second Phase 3 alternative provides a four-lane roadway from Airway Boulevard to Delta Drive. This alternative would travel on the east side of the existing railroad mainline. In order to maintain the existing railroad spur operations, the roadway would need to be on structure starting approximately 1,800 feet south of IH-10, travel over the additional railroad spurs, cross over the railroad mainline, and then begin coming down to tie into Delta Drive at-grade. The typical section used for these alternatives is shown in **Figure 6-14**.

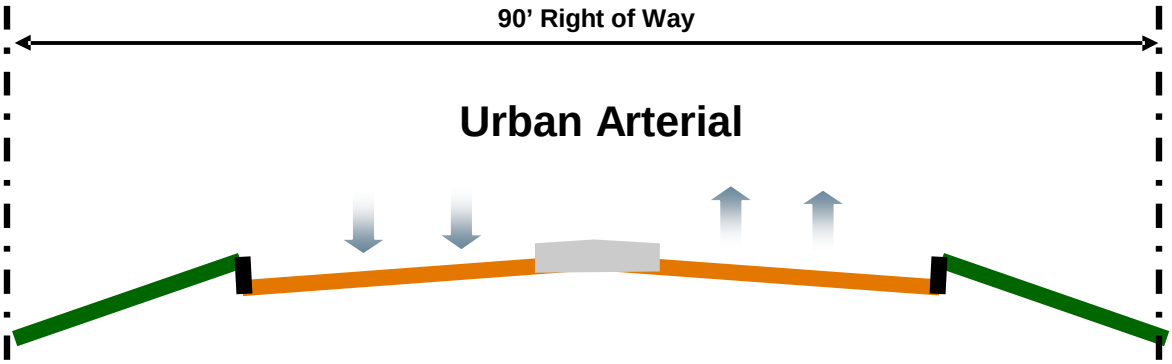


**Figure 6-14 Phase 3 Typical Section**

The following sections show the evaluation of each alternative based on the determined goals. **Tables 6-10** through **6-13** are detailed matrices of all of the major issues identified with each of the Phase 3 alternatives.


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**Table 6-10 Phase 3 Evaluation**

| Features | BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)* | Airway Boulevard to Delta Drive on East Side of RR with Delta Drive At-Grade | Hawkins Boulevard connection by way of existing culvert (two-lanes from Robert E. Lee and four-lanes from Airway Boulevard) Airway Boulevard to Hawkins Boulevard by way of existing culvert |
|---|---|---|---|
| **Eliminate Hazardous Cargo in Residential Areas** | | | |
| **Number of trucks in residential area along Trowbridge Drive and Delta Drive** | No change | Decreases | Minor Change |
| **Designate hazardous cargo route** | No | Yes | Yes |
| | | | |
| **Improve North-South Mobility** | | | |
| **Travel Time and Percent Difference for the following Origins and Destinations** | | | |
| Alameda Avenue to El Paso International Airport (minutes) | 15.16 | 11.00 | 14 |
| Alameda Avenue to El Paso International Airport (percent change) | 0.00% | 27.00% | 7.65% |
| Alameda Avenue to Downtown (minutes) | 27.45 | 20.68 | 26.21 |
| Alameda Avenue to Downtown (percent change) | 0.00% | 24.66% | 4.52% |
| Border Crossing to El Paso International Airport(minutes) | 32.83 | 26.33 | 31.7 |
| Border Crossing to El Paso International Airport (percent change) | 0.00% | 19.80% | 3.44% |
| Border Crossing to Downtown (minutes) | 45.12 | 39.53 | 43.91 |
| Border Crossing to Downtown (percent change) | 0.00% | 12.39% | 2.68% |
| | | | |
| **Volume to Capacity** | | | |
| Trowbridge Drive | 0.95 | 1.16 | 0.81 |
| Delta Drive | 1.23 | 1.38 | 1.18 |
| Alameda Avenue | 0.67 | 0.73 | 0.59 |
| North Loop Drive | 1.06 | 1.12 | 1.03 |
| Hawkins Boulevard | 0.77 | 0.62 | 0.64 |
| Alternative | 0.6 | 0.84 | 0.62 |
| **Decrease Volume Hawkins Boulevard at IH-10** | N/a | 9% | 9% |
| | | | |
| **Minimize Industrial Area Exposure/Impacts** | | | |
| **Number of tanks impacted (ea)** | 0 | 0 | 0 |
| **Impact to Industry Operation** | Low | High | High |
| **Number of additional roadways fronting refinery company property** | 1 | 1 | 1 |
| **Number of additional roadways fronting mining company property** | 1 | 1 | 1 |


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**Table 6-11 Phase 3 Evaluation (continued)**

| Features | | | Hawkins Boulevard connection by way of existing culvert (two-lanes from Robert E. Lee and four-lanes from Airway Boulevard) |
|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Airway Boulevard to Delta Drive on East Side of RR with Delta Drive At-Grade** | **Airway Boulevard to Hawkins Boulevard by way of existing culvert** |
| **Construct Road for a Reasonable Cost** | | | |
| **Number of utility impacts** | | | |
| Number of high mast utilities impacted (ea) | 0 | 11 | 1 |
| Number of above ground utilities(other than high mast utility towers) (ea) | 2 | 17 | 11 |
| Number of below ground utilities impacted: Utility-ea(LF) (X-crossing or T-traverse)* | GAS-1(30)X | GAS-3(498)X | GAS-3(273)X |
| | SAN_SWR-3(90)X | SAN_SWR-1(90)X | SAN_SWR-3(285)X |
| | WATER-1(30)X | SAN_SWR-1(395)T | SAN_SWR-2(1802)T |
| | | WATER-2(181)X | WATER-1(90)X |
| | | STM_SWR-1(320)X | STM_SWR-2(4015)T |
| | | | MISC-1(60)X |
| | | | |
| **Number of buildings impacted** | 0 | 2 | 3 |
| **Disruption of Traffic During Construction** | Low | Med | Low |
| **Total Cost** | $2.0 Million | $30.0 Million | $ 15.0 Million |
| **Avoid Railroad Impacts/Crossings** | | | |
| **Impacts to Railroad Mainline** | No | Yes | No |
| **Number of eliminated spur crossings due to new roadway** | 0 | 2 | 1 |
| **Number of spur railroad crossings (ea)** | 0 | 0 | 0 |


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**Table 6-12 Phase 3 Evaluation (continued)**

| Features | BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)* | Airway Boulevard to Delta Drive on East Side of RR with Delta Drive At-Grade | Hawkins Boulevard connection by way of existing culvert (two-lanes from Robert E. Lee and four-lanes from Airway Boulevard) Airway Boulevard to Hawkins Boulevard by way of existing culvert |
|---|---|---|---|
| **Limit Environmental/Social Impacts** | | | |
| **Archeological Resources Impacted** | None | None | None |
| **Historic Resources Impacted** | None | Impacts to historic industrial complex; possible contributing resources to listed NRHP district; NRHP evaluation required if selected | None |
| **Land Use Impacts** | 2 commercial, 0 residential, 0 community facility | 2 commercial, 1 commercial/industrial adjacent, 0 residential, 0 community facility | 3 commercial, 1 commercial/industrial |
| **Water resources Impacted** | None | None | None |
| **Floodplains Impacted** | None | None | 100 - 500 year floodplain associated with concrete drainage to Phelps Dodge Detention Basin east of project area |
| **Socioeconomic and Community Issues** | None | Construction phase disruption near Phelps Dodge residential area | None |
| **Ecological Resources Impacted** | None | None | None |
| **Noise Impacts** | None | 0-5 impacts located within the Phelps Dodge corporate residential neighborhood (no takes) | None |
| **Air Quality Impacts** | None Expected | None Expected | None Expected |


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**Table 6-13 Phase 3 Evaluation (continued)**

| Features | | | Hawkins Boulevard connection by way of existing culvert (two-lanes from Robert E. Lee and four-lanes from Airway Boulevard) |
|---|---|---|---|
| | **BASELINE - Airway Boulevard to Industrial Avenue (MPO Plan)*** | **Airway Boulevard to Delta Drive on East Side of RR with Delta Drive At-Grade** | **Airway Boulevard to Hawkins Boulevard by way of existing culvert** |
| **Limit Environmental/Social Impacts** | | | |
| **Hazardous Materials** | | | |
| Hazardous Materials (HazRank 1 = Least potential sites for hazardous exposure, HazRank 4 = most potential sites for hazardous expsure) | **HazRank 1**<br>Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 3**<br>Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. | **HazRank 4**<br>Several sites adjoining or within potential right-of-way of route have handled hazardous wastes, and/or having past or present storage facilities not limited to USTs. Site specific investigations are required. |
| Number of sites in proximity to alignment that has had reported releases and/or contamination | 6 | 8 | 14 |
| Number of sites in proximity to alignment that has had violations | 3 | 0 | 12 |


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#### 6.3.5.1 Improve North-South Mobility

The purpose of the Phase 3 alternatives was to provide improved travel time between North Loop Drive and IH-10. The following mobility factors were evaluated for these alternatives:

- Travel time
- Effects of Airway Boulevard at IH-10
- Effects of Hawkins Boulevard at IH-10

The travel time evaluation for these alternatives utilized the same origins/destinations as shown in Phase 1. Each of the alternatives was compared to the baseline case that is already shown in the El Paso MPO plan. The travel time improvements for the Airway Boulevard to Delta Drive resulted in significant benefits. As shown in the evaluation matrices, the percent decrease in travel time ranged from 12% to 27% for the four-lane connection from Airway Boulevard to Delta Drive. The travel time improvement for the Airway Boulevard to Hawkins Boulevard ranged from 2% to 7%.

Assuming that Phase 1 improvements would already be in place prior to Phase 3, the additional traffic movements south of IH-10 would be existing. However, the Phase 3 alternatives provide a four-lane connection to the Airway Boulevard/IH-10 interchange with increased traffic volumes. The projected traffic volume for the Airway Boulevard to Delta Drive alternative is approximately 25,000 vehicles per day in 2030. While travel patterns would change at the interchange, it is expected that the majority of volume will desire to travel to/from north of IH-10 in order to access retail and the El Paso International Airport. The northbound left turning volume is not expected to significantly increase while the southbound left turning traffic that is traveling to Hawkins Boulevard is projected to decrease. It is projected that this new roadway will reduce the traffic for the Hawkins Boulevard/IH-10 interchange by approximately 9%.

The Airway Boulevard to Hawkins Boulevard roadway is expected to accommodate approximately 21,000 vehicles per day in 2030. The effect on the Airway Boulevard/IH-10 interchange would be similar to the other Phase 3 alternative. The majority of traffic would desire to travel north of IH-10 while there would be some impact to the turning movements. The northbound left-turning and southbound left-turning movements would be similar to the Airway Boulevard to Delta Drive alternative. It is also projected that this alternative would result in a 9% reduction for the Hawkins Boulevard/IH-10 interchange.

#### 6.3.5.2 Minimize Truck Traffic in Residential Neighborhoods

Truck traffic is expected to be reduced near the Hawkins Boulevard/IH-10 interchange from Phase 1 improvements. As a possible designated truck route, the Airway Boulevard to Delta Drive alternative would reduce trucks traveling to IH-10 along Trowbridge Drive. While the Airway Boulevard to Hawkins Boulevard alternative could also be designated as a truck route, it is not expected to result in the same reduction in trucks within residential areas.


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#### 6.3.5.3 Minimize Exposure to Industrial Area

As in previous phases, the exposure to the industrial area was evaluated with the following parameters:

- Number of tanks impacted
- Impact to operational areas
- Number of additional roadways fronting the refinery
- Number of additional roadways fronting the mining company

The impact to the industrial areas would be higher for the Phase 3 alternatives. While no tanks would be taken for either alternative, the disruption of operation during construction could be high. As the Airway Boulevard to Delta Drive alternative travels within the small area between Western Refining and Phelps-Dodge Mining Company, it is possible operation to these businesses could be effected during construction and operation of the roadway facility. As the Airway Boulevard to Delta Drive Construct Roadway for a Reasonable Cost the cost for the Phase 3 options took utility relocations and construction cost into account. However, as in the previous phase environmental clean-up was not included in this cost because it was not possible to determine the necessary environmental remediation at this stage. It is reasonable to assume that environmental costs could be significant given the age and type of operation within the industrial area. The water and sewer utility impact costs were provided by the El Paso Water Utilities while El Paso Electric aided in determining the costs for electric line relocations. A review of existing conditions showed that water, sewer, and gas lines would be heavily impacted for each of the Phase 3 alternatives. As the Airway Boulevard to Hawkins Boulevard option travels down an existing drainage ditch, the water utility impacts were much higher for this alternative. El Paso Water Utilities estimated that over $1 million would be required to relocate the necessary water, sewer, and gas lines. The Airway Boulevard to Delta Drive option resulted in a cost of $700,000 in water utility impacts.

The impacts to above ground utilities would also be significant in this phase. It was estimated that the Airway Boulevard to Delta Drive option would impact 11 high mast utility towers and 17 above ground utility poles for a relocation cost of well over $2 million. The Airway Boulevard to Hawkins Boulevard options resulted in impacting one high mast utility pole and 17 above ground utility pole with an estimated relocation cost of nearly $500,000. When determining impacts to utilities, it is also necessary to factor time and permitting. It would require a significant amount of time and effort to determine proper relocation areas for these utilities. The relocation areas must meet proper standards and be able to provide the necessary utilities to the properties that are being served by the existing utilities.

Constructability is also an important factor to evaluate. The Airway Boulevard to Delta Drive alternative would be difficult to construct for several reasons. First, as mentioned previously, utility relocations would be significant. Secondly, the construction area is fairly narrow between the railroad and industrial areas. Thirdly, the environmental concerns, which cannot be fully determined in this study, are expected to be significant. It is expected that a significant amount of


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environmental clean up would be required, given the history of the study area. Also, the design would require the majority of this roadway to be on structure in order to avoid railroad impacts. While it seems reasonable that there would be enough distance to tie into Delta Drive after crossing the railroad, additional factors could be discovered in a more detailed schematic phase. Based on available data and engineering judgment, the cost for the Airway Boulevard to Delta Drive alternative was approximately $30 million.

The constructability of the Airway Boulevard to Hawkins Boulevard alternative was also evaluated. This alternative includes a two-lane connection from Robert E. Lee. As discussed in the Phase 1 evaluation, the current configuration of Robert E. Lee does not provide a desirable situation for additional traffic movements. The railroad splits two roadways that travel under IH-10. As this interchange results in some driver confusion in the existing configuration, additional movements would cause problems operationally and in terms of constructability. The major issues for the four-lane section between Airway Boulevard and Hawkins Boulevard are the need to relocate existing water, sewer and gas utility lines. While environmental issues exist for this alternative, it is expected that remediation and clean up would be a significant portion of the total cost. Without including any environmental remediation, the estimated cost for this alternative is approximately $15 million.

#### 6.3.5.4 Avoid Railroad Impacts/Crossings

In an effort to reduce the impacts to the railroad spurs, the Airway Boulevard to Delta Drive alternative provides a bridged roadway for the majority of it's length. However, it was necessary to cross at-grade an existing railroad spur that is located approximately 1,850 feet south of IH-10. In order to maintain the Phase 1 recommendation of a connection between Airway Boulevard and the industrial park, it was not feasible to cross the spur on structure. The railroad spur enters the industrial park. From field investigation, it did not seem that this spur was very active. The Airway Boulevard to Hawkins Boulevard alternative would also be required to cross the railroad spur in order to provide a connection to Market Avenue as shown in Phase 1.

#### 6.3.5.5 Limit Environmental/Social Impacts

As shown in the previous matrices, a number of environmental elements were evaluated for each alternative. The historical resources analysis revealed that the Airway Boulevard to Delta Drive alternative would result in a NRHP evaluation. The land use impacts for this alternative would be two commercial buildings and one commercial/industrial building. It was also determined that disruption could occur to the Phelps-Dodge residential housing area during construction. The hazardous materials database search revealed that there were eight properties in the proximity of this proposed alignment that has reported releases and/or contamination. A future study would be required in order to determine the necessary measures for environmental clean up.

The Airway Boulevard to Hawkins Boulevard option resulted in three commercial buildings and one industrial building impacted. Additionally, the 100-500 year


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floodplain that is associated with the concrete drainage channel running south of Market Avenue would be impacted. No neighborhoods are expected to be impacted during construction. The hazardous materials database search revealed that 14 properties in proximity to this alignment have reported releases and/or contamination. An additional 12 violations have been sited to businesses within proximity of the alignment.

### 6.3.6 Phase 3 Recommendations

Based on the evaluation of Phase 3 alternatives, which included input from the Stakeholder Committee and general public, the recommendation was a four-lane connector between Airway Boulevard and Delta Drive.

The travel time improvement for the Airway Boulevard to Delta Drive option was a significant benefit. With a range of improvement between 12% and 27% in travel time savings for motorists, the recommended alternative would provide a local and regional benefit to the City.

Although the impacts to utilities and cost for this alternative was much higher than the Airway Boulevard to Hawkins Boulevard, a connection between Airway Boulevard and Delta Drive would provide the improved north-south mobility that would provide better access north of IH-10. Along with utility relocations, this Phase 3 recommendation would require significant time for environmental documentation and clean up prior to construction.

**Figure 6-15** shows the Phase 3 recommendation. **Figures 6-16** through **6-19** show a conceptual layout for the Phase 3 recommendation. In order to maintain the connection to Market Avenue, the railroad spur shown in **Figure 6-17** would be eliminated. Also, the two-lane connection between Airway Boulevard and Market Avenue would be modified. The proposed roadway would provide a bridge structure starting approximately 1,200 feet south of the Market Avenue connection. The roadway would remain on structure over two railroad spurs and the railroad mainline. Another railroad spur would be eliminated, as shown in **Figure 6-19**. It was necessary to eliminate this railroad spur in order to provide ample distance for an at-grade connection at North Loop Drive. The conceptual layout provides a distance of approximately 1,000 feet for the proposed roadway to connect at-grade to North Loop Drive. According to representatives at Western Refining, the eliminated railroad spur serves a less important function to their operation than other spur entering the facility.


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**Figure 6-15 Phase 3 Recommendations**


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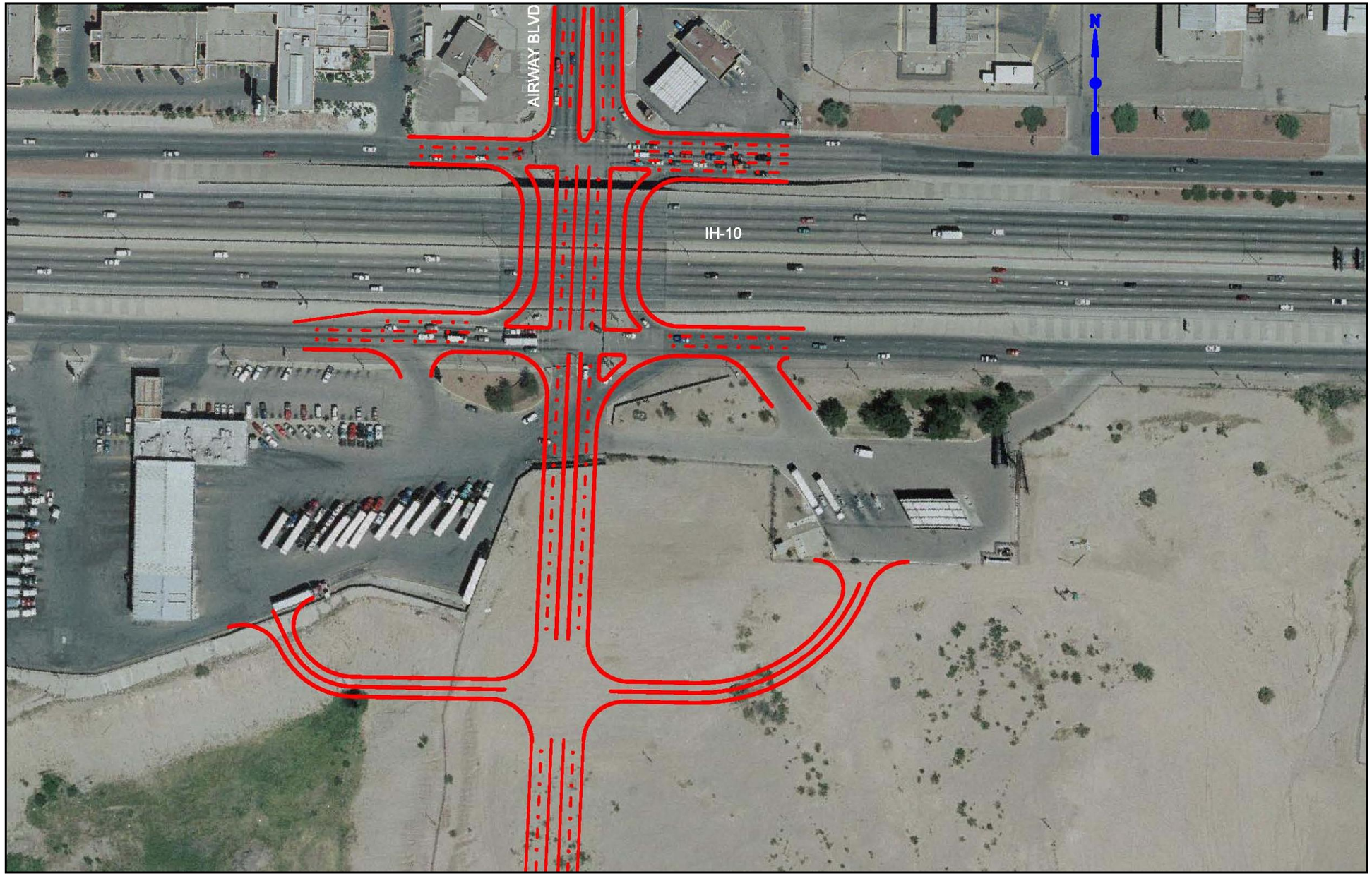


**Figure 6-16 Phase 3 Recommendation – Section 1**


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**Figure 6-17 Phase 3 Recommendation – Section 2**


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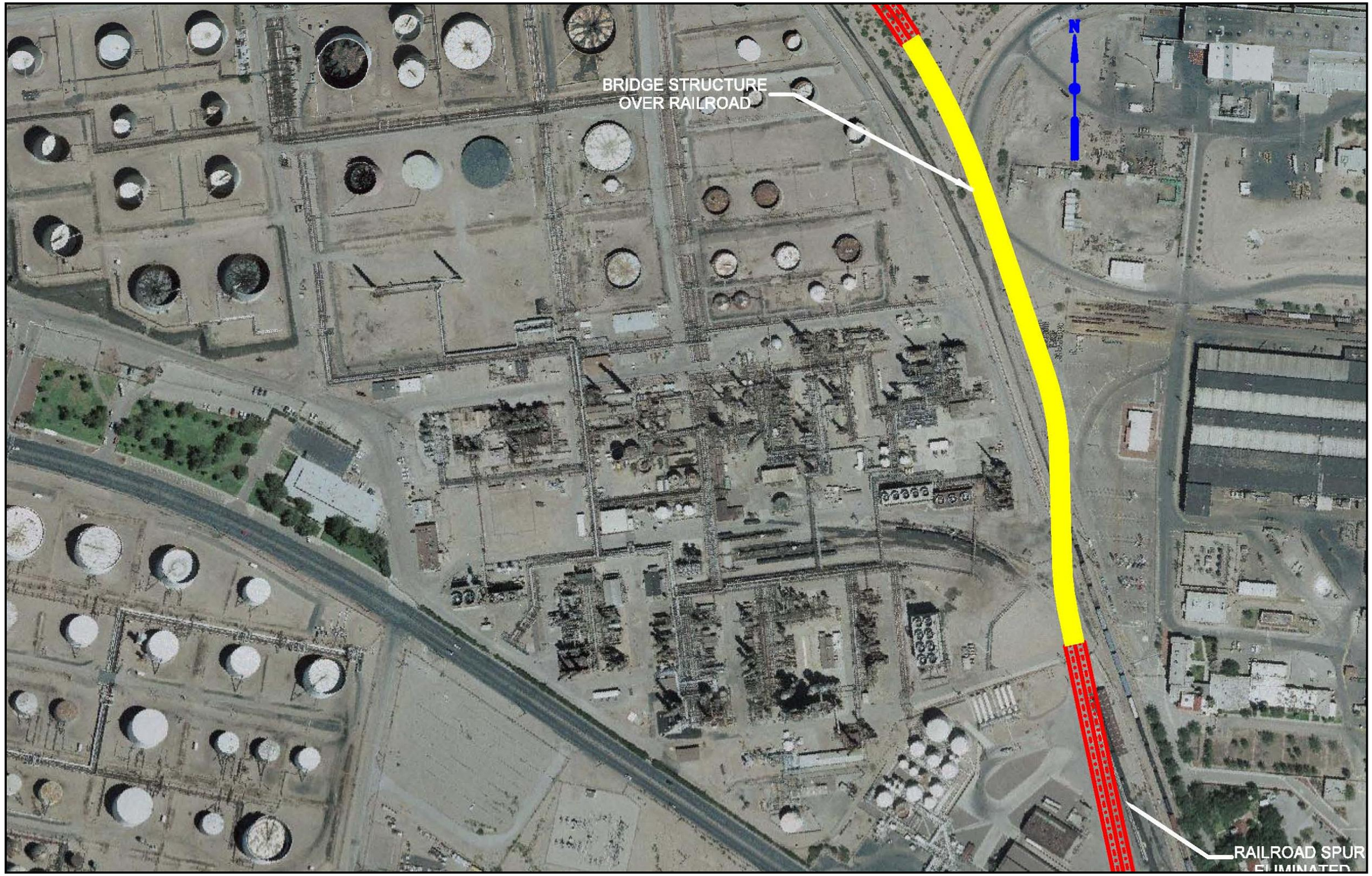


**Figure 6-18 Phase 3 Recommendation – Section 3**


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**Figure 6-19 Phase 3 Recommendation – Section 4**


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## 6.4 CONNECTION TO BORDER HIGHWAY

The purpose of this study was to improve north-south mobility in order to connect the area south of the study area to the area north of IH-10. While the northern and southern study area boundaries were IH-10 and Trowbridge Drive/North Loop Drive, respectively, it would be beneficial to provide a connection down to Border Highway. A connection from IH-10 to Border Highway would provide several benefits to the transportation system both locally and regionally.

A connection between IH-10 and Border Highway could be used to move the hazardous cargo designation from Delta Drive to the new roadway. Designating a proposed roadway between IH-10 and Border Highway as a hazardous cargo route would reduce the truck traffic within the neighborhoods along Delta Drive. Businesses within the study area are a major destination for truck traffic. In addition to Delta Drive, truck traffic is also expected to be reduced along Hawkins Boulevard, Alameda Avenue, North Loop Drive, and Trowbridge Drive. Truck traffic currently uses all of these roadways in order to reach the study area.

According to City of El Paso officials, Azcarate Park is currently underutilized. One of the reasons cited this is the poor access to the park. Depending on the type of facility that would be constructed, it is possible that a new roadway would improve access to the park.

This roadway would also benefit mobility from Border Highway to the Central Business District or the El Paso International Airport. A new roadway would significantly reduce travel time. Along with truck traffic, passenger car traffic is also expected to be reduced with the construction of a new connection between IH-10 and Border Highway.

Yarbrough Drive and Zaragoza Drive are currently the only north-south roadways that connect Border Highway to IH-10 between IH-10 and Joe Battle Freeway. Yarbrough Drive is located approximately 4 miles east of Delta Drive while Zaragoza Drive is located an additional 2.5 miles. Without a major north-south connector within close proximity to the study area, a new roadway would provide significant mobility benefits to the region.

It is recommended that a future study determine the feasibility of constructing a north-south roadway that would continue the connection proposed from Delta Drive down to Border Highway. The location of the future connection would need to be determined in this future study. Possible study locations of this new roadway would include but are not limited to the east end of Azcarate Park as well as the existing drainage easement east of the park. The alignment determined from the study will be considered a final


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## 6.5 RECOMMENDED ALTERNATIVES

Based on the analysis process, which included four Stakeholder Meetings and two general public meetings, a phased alternative approach was recommended. The alternatives were separated into different phases based on the expected number of impacts. The Phase 1 alternative would result in minimal impacts with some benefit to the transportation system while the Phase 2 and Phase 3 alternatives would result in increasing impacts with improved benefits. The Phase 1 recommendation resulted in a two-lane connector between Airway Boulevard and Market Avenue. During the evaluation, Phase 2 was considered a connection between Hawkins Boulevard and North Loop Drive. However, the Phase 2 alternatives were eliminated. The Phase 3 evaluation resulted in recommending a four-lane connection between Airway Boulevard and Delta Drive that would be located on the east side of the railroad. Since the Phase 2 evaluation resulted in eliminating both alternatives between Hawkins Boulevard and North Loop Drive, the Phase 3 recommendation was renamed Phase 2. Finally, it is recommended that a future study determine a preferred alignment that would extend down to the Border Highway. The results of this study are considered Phase 3.

**Table 6-14 Phased Recommendations**

| Phase | Alternative | Brief Description |
|---|---|---|
| Phase 1 | Market Avenue Connections | 2-lane connection between Airway Boulevard and Market Avenue |
| Phase 2* | Airway Boulevard to Delta Drive on East Side of Railroad with At-Grade Connection to North Loop Drive | 4-lane connection between Airway Boulevard and Delta Drive as it travels on the east side of the railroad. Provides at-grade connection for North Loop Drive |
| Phase 3** | Connection to Border Highway | While this study analyzed the area between Airway Boulevard and Trowbridge Drive/North Loop Drive, a future study is required to determine a feasible alignment that would connect to the Border Highway |

* Considered as Phase 3 during evaluation. The connection between Hawkins Boulevard and North Loop Drive was previously considered Phase 2 but was eliminated during the evaluation. Therefore, the Phase 3 recommendation became Phase 2.

**The need for a connection down to Border Highway was discussed. Therefore, this connection that would be determined by a future study was considered Phase 3.


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# 7.0 STUDY RECOMMENDATIONS AND ACTION PLAN

With input from the Stakeholder Committee and the general public, the Study Team developed several potential transportation solutions. The transportation options were then categorized into a phased plan that ranged from alternatives with lower impacts and a shorter construction time frame to alternatives with high impacts, significant benefits to the roadway network and a longer construction time frame. The following sections summarize the recommendations for each phase as well as a potential action plan for the projects.

## 7.1 STUDY RECOMMENDATIONS

### 7.1.1 Phase 1 Recommendations

The purpose of the Phase 1 recommendations was to provide trucks within the Industrial Park an alternate route to Hawkins Boulevard in order to access IH-10. With this goal in mind, the Phase 1 recommendation was to provide a two-lane connection between Airway Boulevard and Market Avenue. The estimated cost for the two-lane connector is $2.6 million, excluding environmental remediation.

Phase 1 recommendations are independent of the planned upgrade of Hawkins Boulevard to six lanes. The planned upgrade of Hawkins Boulevard will include implementing a corridor access management scheme along Hawkins Boulevard that could include but is not limited to the following improvements:

- Driveway/access consolidation
- Signal timing improvements along Hawkins Boulevard for Commerce Street, Industrial Avenue, and Market Avenue
- Intersection improvements along Hawkins Boulevard for Commerce Street, Industrial Avenue, and Market Avenue

### 7.1.2 Phase 2 Recommendations

The purpose of Phase 2 was to provide a direct connection between North Loop Drive and IH-10 while incorporating the recommendations from the first phase. Phase 2 recommendations would result in significant benefit to the transportation system while resulting in high impacts to utilities, land use, and the environmental factors. The Phase 2 recommendation was to provide a four-lane roadway between Airway Boulevard and Delta Drive. The estimated construction cost for this option was $30 million, excluding environmental remediation.


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### 7.1.3 Phase 3 Recommendations

Phase 3 was considered a connection between IH-10 and Border Highway.
A connection from IH-10 to Border Highway would provide several benefits to the transportation system both locally and regionally. A connection between IH-10 and Border Highway could be used to move the hazardous cargo designation from Delta Drive to the new roadway. Designating a proposed roadway between IH-10 and Border Highway as a hazardous cargo route would reduce the truck traffic within the neighborhoods along Delta Drive. Businesses within the study area are a major destination for truck traffic. In addition to Delta Drive, truck traffic is also expected to be reduced along Hawkins Boulevard, Alameda Avenue, North Loop Drive, and Trowbridge Drive. Truck traffic currently uses all of these roadways in order to reach the study area.

Yarbrough Drive and Zaragoza Drive are currently the only north-south roadways that connect Border Highway to IH-10 between IH-10 and Joe Battle Boulevard. Yarbrough Drive is located approximately four miles east of Delta Drive while Zaragoza Drive is located an additional 2.5 miles. Without a major north-south connector within close proximity to the study area, a new roadway would provide significant mobility benefits to the region.

It is recommended that a future study determine the feasibility of constructing a north-south roadway that would continue the connection proposed in Phase 2 down to Border Highway. The location of the future connection would need to be determined in this future study. Possible study locations of this new roadway would include but are not limited to the east end of Azcarate Park as well as the existing drainage easement east of the park.

The following figure shows the recommendations.


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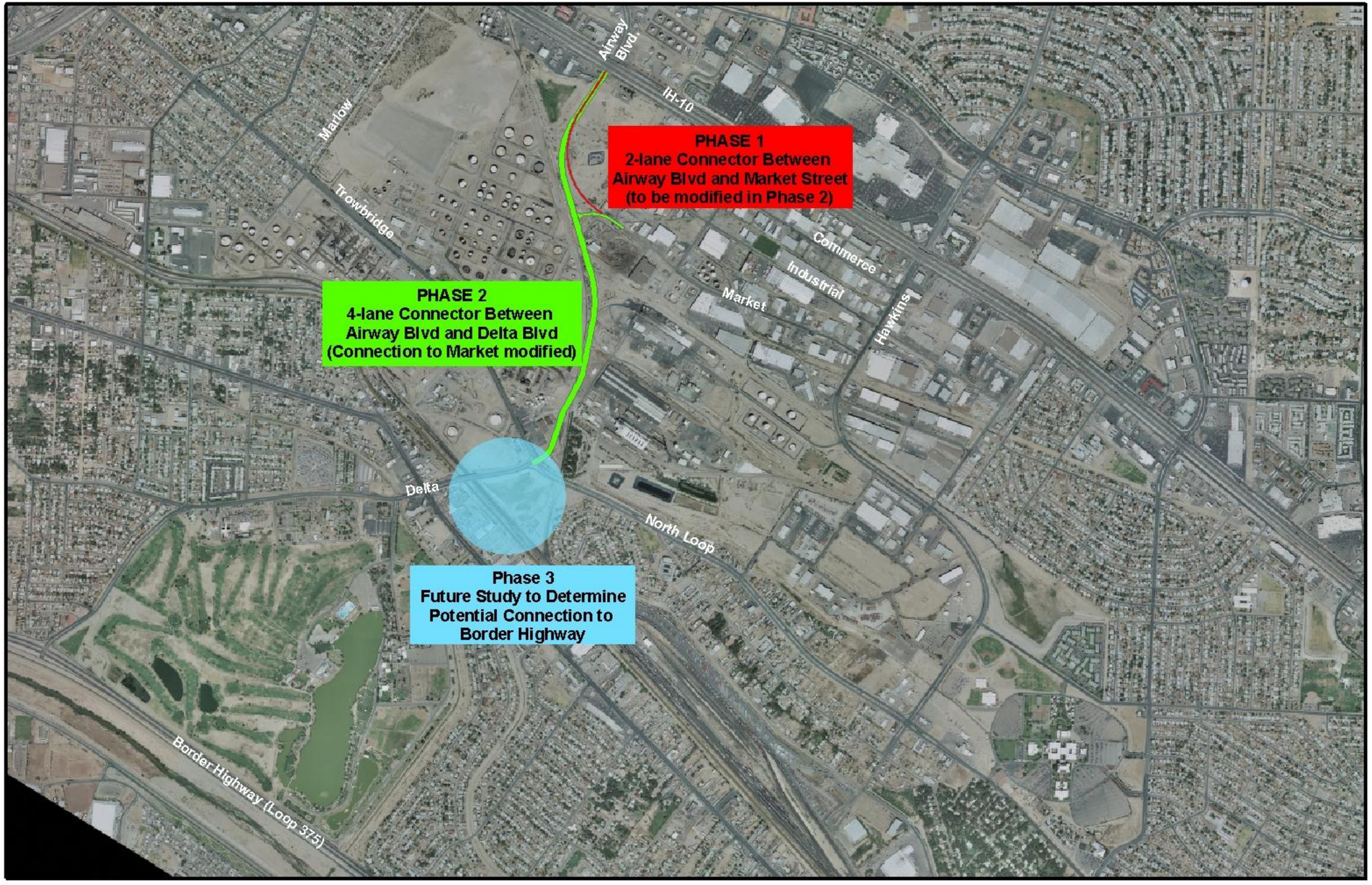


**Figure 7-1 Recommended Alternatives**


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## 7.2 ACTION PLAN

The success of implementing the recommended solutions is dependent on the coordination between a variety of entities. This section attempts to identify the roles and responsibilities of each agency in meeting the goals of this study. The following list outlines a suggested action plan along with agency responsibility.

| Steps | | Agency |
|---|---|---|
| 1. | Policy board approval of study | El Paso MPO |
| 2. | Secure funding of Phase 1 improvements | City and TxDOT |
| 3. | Environmental documentation and preliminary schematic design for Phase 1 recommendations | City and TxDOT |
| 4. | Final design of Phase 1 recommendations | City and TxDOT |
| 5. | Hawkins Boulevard upgraded to six-lanes as planned along with the implementation of access management strategies | MPO, City and TxDOT |
| 6. | Construction of Phase 1 recommendations including coordinating utility relocations | City and TxDOT |
| 7. | Perform Feasibility Study for Phase 3 Improvements to determine potential connection to Border Highway | MPO, City and TxDOT |
| 8. | Secure funding of Phase 2 improvements | MPO and TxDOT |
| 9. | Environmental documentation and preliminary schematic design for Phase 2 recommendations | City and TxDOT |
| 10. | Final design of Phase 2 recommendations | City and TxDOT |
| 11. | Construction of Phase 2 recommendations including coordinating utility relocations | City and TxDOT |
| 12. | Secure funding of Phase 3 improvements | MPO and TxDOT |
| 13. | Environmental documentation and preliminary schematic design for Phase 3 recommendations | City and TxDOT |
| 14. | Final design of Phase 3 recommendations | City and TxDOT |
| 15. | Construction of Phase 3 recommendations including coordinating utility relocations | City and TxDOT |

Environmental remediation is a major factor that will need to be studied as a future effort with the environmental documentation and preliminary schematic phase. While impacts to the environment were identified, this study did not include determining the level of clean up or remediation with each of the recommended solutions.

This study attempted to gain the input of local business leaders, stakeholders, City officials, and the general public. As mentioned previously, it was clear that implementing the recommendations in a phased plan would divide the expected impacts to utilities, land uses, and the environment in more manageable doses while providing benefits to the transportation system.


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