Ysleta-Zaragoza Port of Entry Improvements
Preliminary Engineering Report
El Paso, Texas

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P.E.
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Prepared for
City of El Paso
International Bridges

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INTRODUCTION

BACKGROUND

The Ysleta-Zaragoza Bridge, connects the communities of El Paso, Texas and Juarez, Mexico. This bridge handles passenger vehicles, trucks, and pedestrian traffic. Truck (Commercial) traffic is physically separated on the bridge. The bridge operates from 6:00 A.M. to midnight Monday through Friday, and 8:00 A.M. to 4:00 P.M. on Saturday. The crossing is closed to commercial vehicle traffic on Sunday.

The GSA owns the U.S. border crossing facility, which is operated by U.S. Customs. The City of El Paso owns and operates the tollbooths for trucks heading to Mexico. The tollbooths for U.S.-bound trucks are owned by CAPUFE.

Traffic at the Ysleta-Zaragoza Bridge has grown significantly due in part to extreme congestion at the other El Paso bridges as a result of the large number of maquiladora/warehouse operations that have been established on the east side of Juarez. The City of El Paso has identified multiple projects to better manage truck traffic at the Zaragoza border crossing.

This Preliminary Engineering Report provides design alternatives and cost estimates to build and develop the projects identified on sheet ten. The Engineer will coordinate with the City of El Paso to incorporate these projects into the El Paso Metropolitan Planning Organization (MPO) Transportation Improvement Program (TIP).

PROJECT AREA

Figure 1 represents the project area around the Ysleta-Zaragoza Port of Entry where improvements for truck traffic are proposed. The identified projects have the purpose of improving the environment for traffic entering or leaving the United States. These projects consist of a combination of Intelligent Transportation System (ITS), signing, striping, wireless communications to mobile devices and unmanned toll collection system.

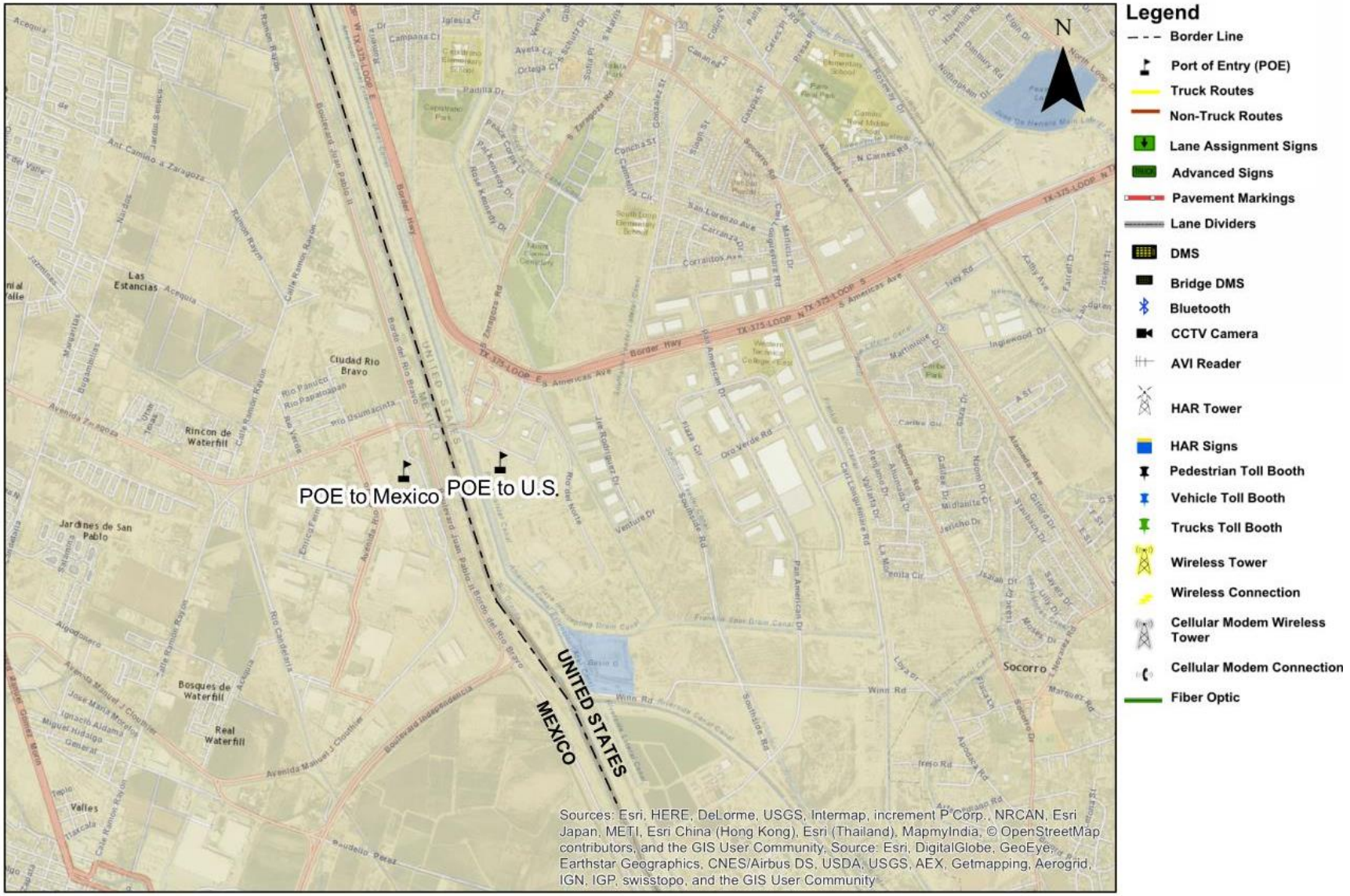

Figure 1: Project Area

EXISTING CONDITIONS

Street Network (US Side)

The primary street network adjacent to the Port of Entry (POE) and those that feed the border crossing traffic were taken into consideration in the planning and design of the projects on this report. The following section describes the existing conditions of these roads and their importance to the border crossing traffic:

- Border Highway (Loop 375), also named Cesar Chavez Border Highway along the border with Mexico is a major expressway that travels through El Paso and provides two lanes of travel in each direction with one additional toll road lane in each direction. The Border Highway is the main connection with Interstate Highway 10 and commercial vehicles (trucks) coming from all over town use this major road as their primary access to the POE. Along the Border Highway in the westbound direction, there are two exit ramps (East of Zaragoza Rd. and East of Alameda Ave.) that are used to access the POE. Along Border Highway in the eastbound direction, there is one exit ramp (West of Zaragoza Rd.). The posted speed limit is 60 mph.

- North and South Americas Ave. are frontage roads parallel to the Border Highway (Loop 375). North Americas Ave. is on the west side of the Border Highway and South Americas Ave. is on the East side of the Border Highway. Throughout the study area, both, North Americas Ave. and South Americas Ave., provide three lanes of travel. In addition, the intersection offers various lane assignments with additional lane assignments such as U-turns, right turn bays or mandatory right turn lanes. The posted speed limit is 45 mph.

- Pan American Drive is an east-west major arterial that crosses through the heart of a warehouse complex. Pan American Drive connects Americas Ave. with Winn Rd. and provides two lanes of travel in each direction. Pan American Drive extends to the North side of the Loop 375 and provides access to the warehouses on this side of the road. The posted speed limit is 30 mph.

- Zaragoza Road is a North-South collector road that connects Interstate Highway 10 and Border Highway. Zaragoza Rd is mainly used by passenger and transit vehicles. Commercial vehicles do not use this route to access the POE. The roadway consists of two lanes of travel in each direction. The southbound approach expands to three lanes at the intersection with Americas Ave. The posted speed limit is 40 mph.

- Winn Road is an existing East-West minor road. The forty-eight feet wide road has no striping and runs from Loya Road to Pan American Drive. The road is scheduled for improvements and

reconstruction to connect Pan American Drive to Rio del Norte Drive. This will provide an entrance to, and departure from the POE.

- Rio Del Norte Drive is a four lane arterial road. The road serves as an entrance and departure for the commercial border crossing traffic of the POE. The road is scheduled for renovation to connect Pan American Drive to the Rio del Norte Drive by extending the current Winn Road. This will provide a new entrance and departure from the POE.

- Southside Road is an East-West minor street that runs parallel to Pan American Drive and provides access a few properties that are currently restricted to thru traffic.

Figure 2 provides trucks routes on the U.S. side.

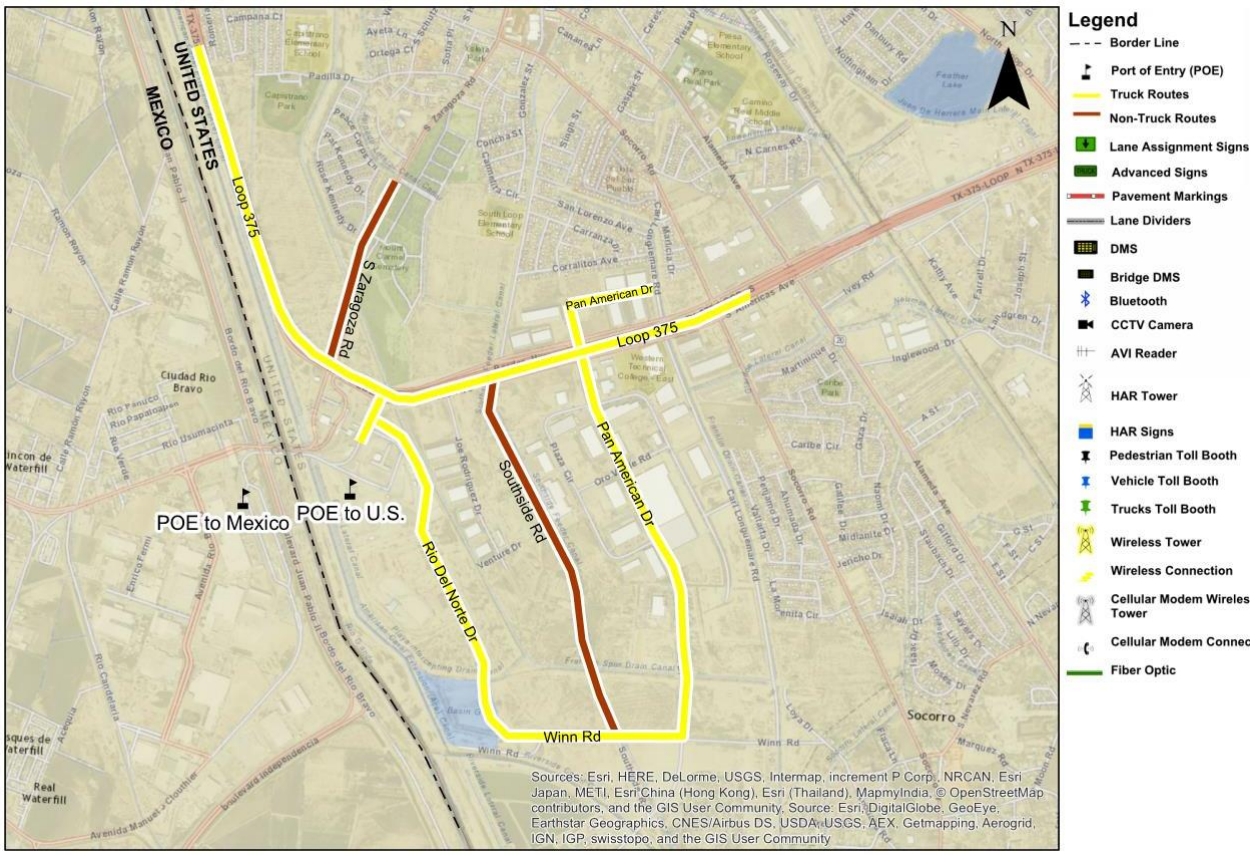

Figure 2: Truck Routes U.S. Side

Street Network (Mexico Side)

- Boulevard Independencia is an express way with two main lanes and two service lanes in each direction. Boulevard Independencia runs North and South and connects to Boulevard Juan Pablo II and serves as the main route for heavy trucks to access the POE. The posted speed limit is 40 mph.

- Prolongación Manuel J Clouthier is an East-West major arterial that connects to Boulevard Manuel Gomez Morin and is the main entrance to the POE. This road provides two lanes of travel in each direction and there is no posted speed limit in the study area limits. There is a new connection road that connects to the Boulevard Independencia service road and is used by traffic coming out (Southbound) of the POE.

- Rio Bravo is a North-South collector road that connects to Waterfill Street, which is the main access to passenger vehicles to the POE. Rio Bravo is mainly used by local traffic to access warehouses located in this area. The roadway consists of two lanes of travel in each direction. The posted speed limit is 40 mph.

Figure 3 provides truck routes on Mexico's side.

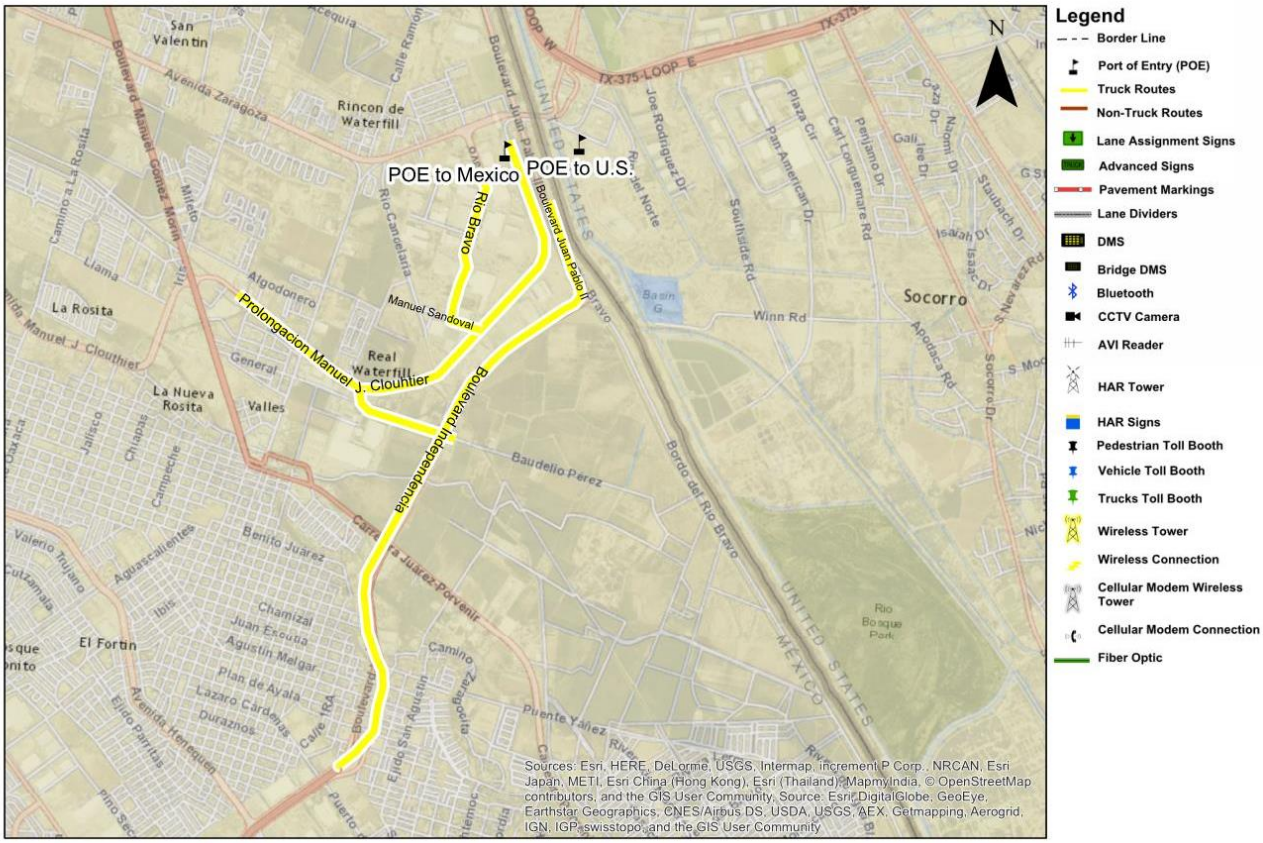

Figure 3: Truck Routes Mexico's Side

IDENTIFIED PROJECTS

This PER provides an overview of the following six projects:

SIGNING AND STRIPING

1. Signing and Striping to better guide trucks to the correct lane while entering/exiting the U.S.
2. Signing and Striping to better guide trucks to the correct lane while entering/exiting Mexico.

INTELLIGENT TRANSPORTATION SYSTEMS

3. Intelligent Transportation System devices to provide border crossing times on the U.S. side, including DMS, CCTV cameras, Bluetooth readers and AVI detector.
4. ITS devices including DMS, CCTV cameras, Bluetooth readers and AVI detector to better guide trucks to the correct lane, and provide border crossing times on the Mexico side.

BORDER CROSSING TRAFFIC CONDITIONS DISSEMINATION

5. Software development to disseminate border crossing information to subscribed users.

ELECTRONIC TOLL COLLECTION SYSTEM

6. Upgrade of tolling system to an unmanned Electronic Toll Collection (ETC) System at all border crossings on the U.S. side managed and operated by the City of El Paso.

This PER also provides a cost comparison and benefits between fiber optic cable infrastructure/network, wireless and cellular connectivity.

PER also provides a cost comparison and benefits between fiber optic cable infrastructure/network, wireless and cellular connectivity.

STAKEHOLDER INPUT

The City of El Paso held focus group meetings with multiple Port of Entry stakeholders. The projects described above were presented at multiple meetings and the stakeholders provided feedback. The following is a summary of their comments:

- Signing and Striping –The POE stakeholders agreed that additional signing and striping would benefit the non-regular truck traffic and would reduce congestion from passenger vehicles mixing with truck traffic. Although, local truck drivers are given specific routes and are assigned a specific

port of entry prior to leaving the maquiladora plant. Hence, local truck drivers would not see greater benefit from this.

- CCTV Cameras –The POE stakeholders liked the idea of having access to view CCTV cameras along the port of entry queue line. This would assist dispatchers, at their plants, to direct their trucks to the less congested port. This would distribute truck traffic between Ysleta/Zaragoza and the Bridge of the Americas. As a result, truck traffic would be reduced.

- Dynamic Message Signs (DMS) –DMS displaying important traffic information or border crossing times would help non-regular truck traffic decide which port of entry to use. The group requested to have DMS messages available thru the internet. This feature will allow dispatchers at their plants to direct their fleet to the less congested port.

- Bluetooth and AVI Readers - The POE stakeholders supported the idea of installing Bluetooth and AVI readers along the Ysleta/Zaragoza queue line. They stressed the need to have closer to real-time truck traffic border crossing time information.

- Highway Advisory Radio System - the POE stakeholders considered this to benefit empty trucks traveling southbound. Traveling back to Mexico, truck drivers with empty trucks have the option to use either BOTA or Zaragoza ports of entry. Similarly to DMS information, the group requested to make Highway Advisory Radio (HAR) messages available thru the internet. HAR messages would be listened at their plant or any location outside HAR coverage.

- Lane Barrier- the POE stakeholders agreed that is it necessary to keep non-FAST truck traffic from the FAST lane. However, POE stakeholders group did not believe the proposed lane barrier would keep truck from switching lanes, unless it was combined with some type of technology.

  The POE stakeholders requested to install some type of technology that would identify trucks switching lanes along the queue line. This data shall be put into a report and shall be made accessible to plant managers.

  In addition, the group discussed that the proposed lane barrier installation as proposed would interfere with K9 inspections.

- K9 Inspection -

- For plant managers, K9 inspection is mandatory for all trucks traveling northbound. This prevents contaminated trucks from reaching the Ysleta/Zaragoza Port of Entry.
- There are currently six different K9 units operating in the area. Most of these K9 units are privately owned businesses.
- Each K9 inspection takes approximately 10 to 15 min per truck.
- Getting trucks inspected requires vehicles getting in and out of the lane to the K9 inspection area, thereby, generating additional bottlenecks.

Based on the comments received during this meeting the following suggestions were taken into consideration to update the cost of each of the below projects.

- Ave. Manuel J. Clouthier /Ave. Robert Bosch shall be reconfigured for to increase capacity.
- Parallel parking shall be removed
- Street vendors are forbidden in this area
- Access to BOSCH plant entrance shall remain along the Ave. Robert Bosh.
- A raised median, 15 ft. wide, shall be installed along the street to accommodate K9 inspections.

PROJECT 1 AND 2 SIGNING AND STRIPING

The City of El Paso currently has four signs to guide trucks exiting the U.S. thru the Ysleta-Zaragoza POE. Three of these signs are ground-mounted at the adjacent intersections. Another sign is located on Cesar Chavez eastbound exit prior to Zaragoza Rd., indicating lane assignments for cars and trucks. However, it is not clear which traffic lanes trucks can use to avoid conflicts with passenger vehicles. The current striping on the adjacent streets is typical of other intersections. There is no striping that can designate a lane as a proposed truck lane only.

On the Mexico side, there is a need for better signing and striping. Striping on the Juarez street network is non-existent in some sections. The commercial truck lane queues back up along Av. Manuel J. Clouthier from the POE's main entrance to Calle Ramon Rayon. Warehouse driveways located along the route affect the truck queues and should be taken into consideration during the delineation of a truck route.

Striping on both sides of the border will consist of travel lane striping, pavement marking words (such as "TRUCK ROUTE", "TRUCK LANE", and "CAR LANE"), pavement marking arrows, and striping along truck lane separators, as shown on Figure 4. Proposed signs can be classified in two categories, advance signs and lane assignment signs. Advance signs will guide trucks to the port of entry, while the lane assignment signs will allocate trucks to preferred truck lanes. Lanes will not be exclusive to trucks but the delineation of a truck

route could allow a more organized approach to the current truck congestion experienced during peak hours. Advance signs will be overhead while lane assignment signs could be ground mounted. Figure 5 shows proposed signs.

The proposed lane separator option functions as a concrete curb. The height of the lane separator varies from three to five inches. This works as a physical separation without obstructing the users' view. The separators can be aligned parallel to the travel lanes or at an angle as shown on Figure 6 to allow trucks to exit the FAST lane in case of a breakdown, while at the same time preventing trucks from changing lanes into the FAST lane. Figure 6 shows an example of a typical zebra lane separator and the corresponding striping.

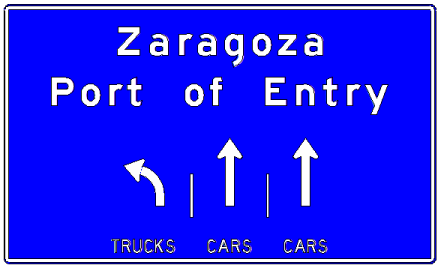

Figure 5: Proposed Truck Routes Signs

Figure 6: Lane Dividers

(Photo credit: FASTcoexist)

Figure 4: Proposed Pavement Marking

PROJECT 1: SIGNING AND STRIPING U.S. SIDE

This project includes signing and striping to guide the commercial trucks into the Zaragoza-Ysleta POE southbound truck route. The project accounts for the construction and design of the signing (overhead signs and small signs), striping to guide commercial trucks to their designate lanes and lane dividers to be placed on the POE Bridge lanes.

Various construction projects are scheduled and proposed in the area to provide the new southbound commercial truck route (See Figure 7).

The following describes the truck routes using the new proposed roads. Commercial trucks coming from the LP375 eastbound direction will exit on the Pan American Ave. to later use Winn Rd. and Rio Del Norte Dr. to access the POE southbound bridge. Commercial trucks coming from the LP375 southbound need to use the U-Turn on the Americas Ave Gateway to access Pan American Ave. The new truck route is shown in Figure 8. The new route should provide greater capacity for the commercial trucks to queue without disturbing non-commercial traffic. The traffic impact and traffic circulation of the new commercial truck route was not evaluated in this analysis.

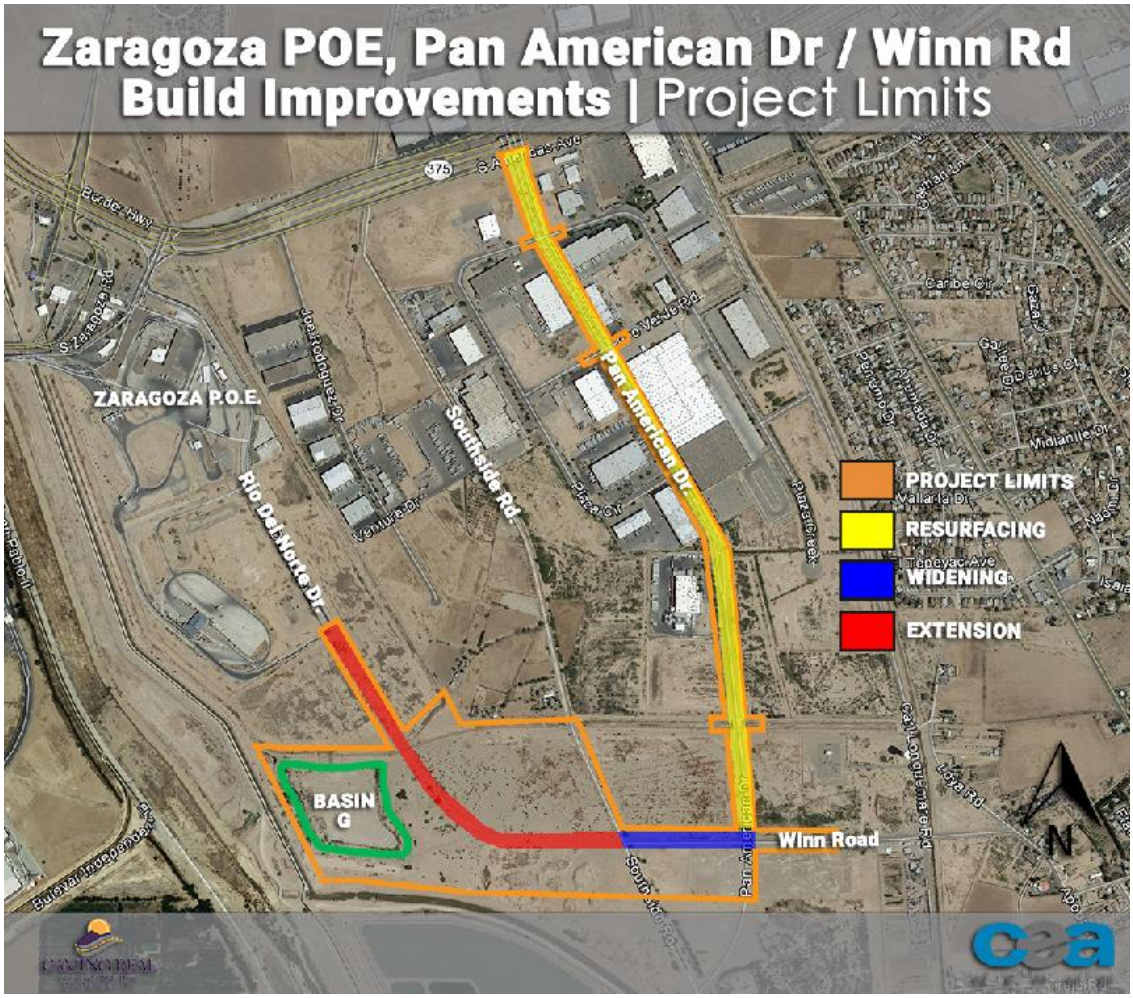

Figure 7: Zaragoza POE, Pan American Dr./Winn Rd. Build Improvement Project Limits

Proposed truck guiding striping on the US side will be kept at a minimum. The scheduled projects shall provide the pavement markings that delineate the number of lanes and widths on the new roads. The pavement markings included in the cost estimate for this project includes words such as “TRUCK ROUTE”, “TRUCK LANE” or “TRUCKS” and arrows to delineate the proposed truck route.

Lane separators and pavement markings are proposed in Project 1 - segment 1 to separate the designated FAST Lane from other Lanes.

Figure 9 provides an overview map of proposed improvements in Project 1. Figure 8 depicts Project 1 broken into multiple segments for construction cost estimation purposes.

Refer to Appendix A.2 for proposed striping, signs and lane separator locations and ROW ownership. **Table 1** illustrates an estimated timeline for project 1.

Table 1: Time Frame for Project 1

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 1: Signing and Striping US side							
Time (Months)	2	1	3	1	3	3	13

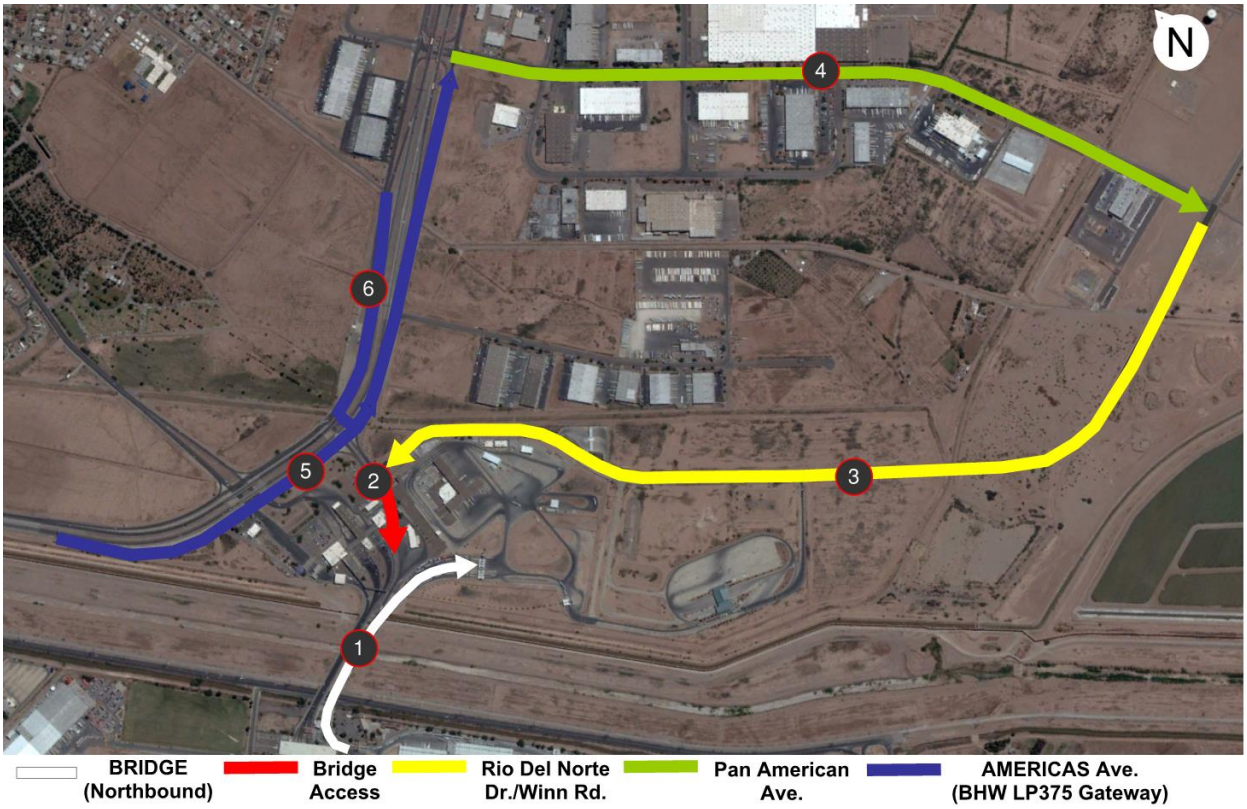

Figure 8: Possible Signing Location Based on Truck Route

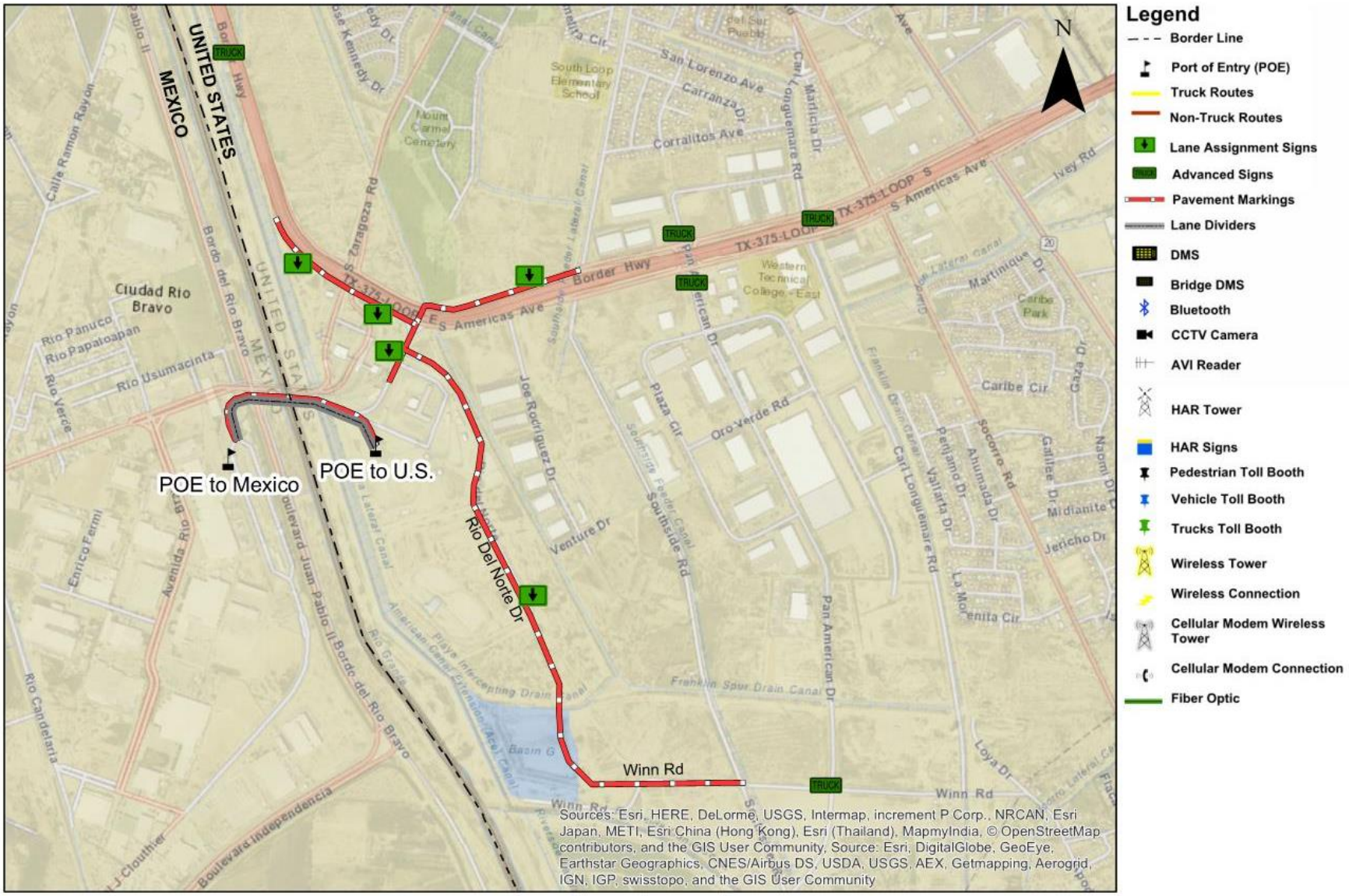

Figure 9: Project 1 Signing and Striping US side

The renderings in **Figure 10** illustrate concept design for the proposed overhead mounted large signs and proposed small signs mounted on the side of the road. These signs shall be supplemented with lane assignment markings and roadside mounted small signs to provide a better direction to truck drivers. The below signs are only examples. Those shall be designed during plan sheet development.

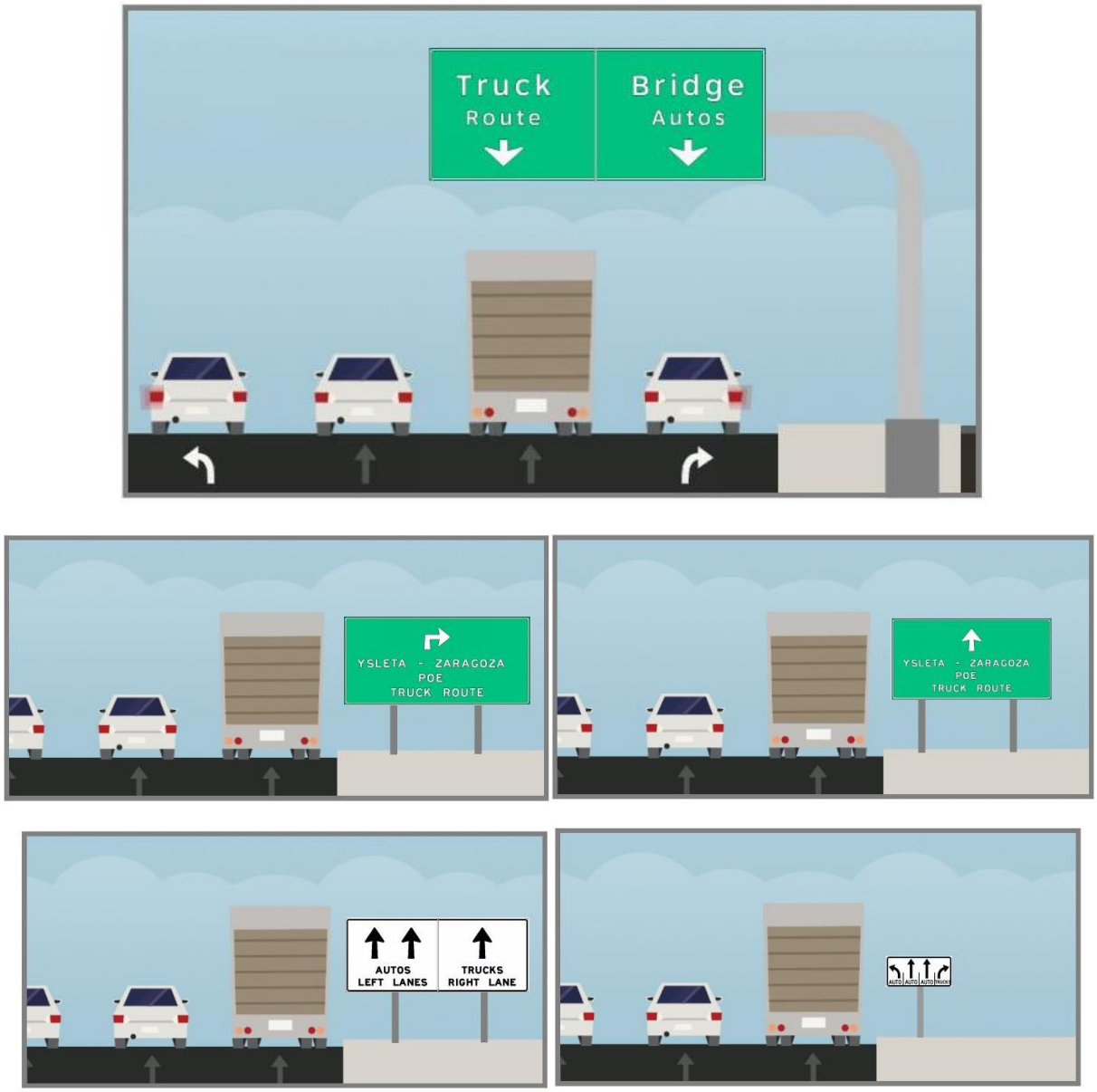

Figure 10: Signing Examples

PROJECT 2: SIGNING AND STRIPING MEXICO SIDE

This project includes signing and striping to better guide trucks into the correct lane on the Mexico side by providing for the design of overhead direction signs, truck route signs and lane assignment signs.

Figure 11 provides a map with the proposed project. Refer to Appendix A.2 for proposed striping, signs and lane separator locations and ROW ownership. Table 2 illustrates an estimated timeline for project 2.

Table 2: Time Frame for Project 2

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 2: Signing and Striping Mexico side							
Time (Months)	2	1	3	1	3	3	13

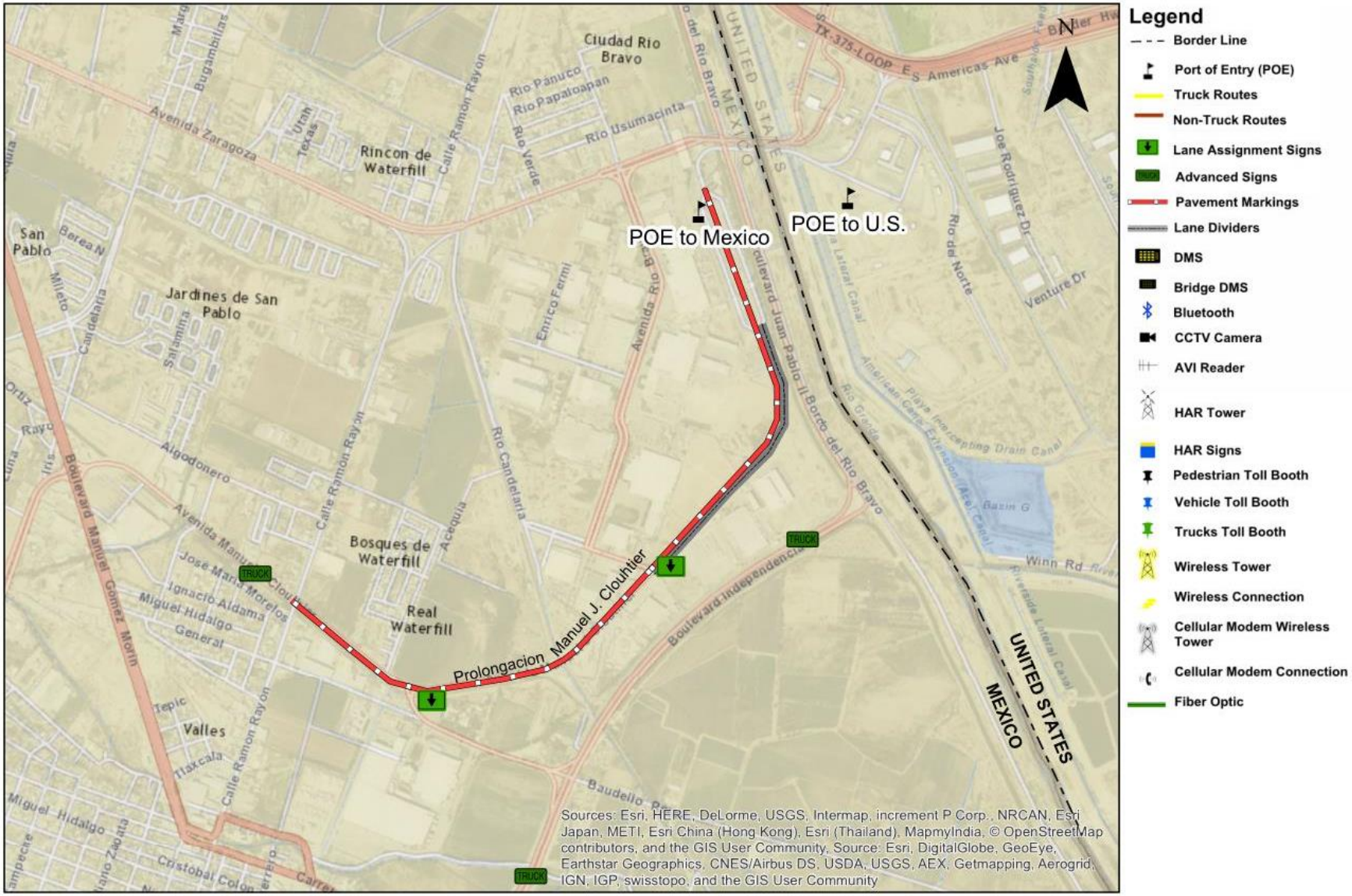

Figure 11: Project 2 Signing and Striping Mexico side

Signing and striping for **Project 2** was divided into five segments. Table 3 below show the limits and length of each of these segments.

Table 3: Signing and Striping MX Side Sections

Section ID	From	To	Distance (ft)
1	Ramon Rayon	Baudelio Perez	1,700
2	Baudelio Perez	Rio Candelaria	1,600
3	Rio Candelaria	Manuel Sandoval	1,400
4	Manuel Sandoval	Blvd. Independencia Access	2,700
5	Blvd. Independencia Access	Aduana Gate	500

Figure 12: Signing and Striping Sections

Segment Description

The end of pavement limits (width of the road) for segments 1 and 2 are not well defined. Plus, pavement condition in these segments its poor. Segments 1 and 2 are proposed to remain with the current traffic lane configuration. Existing road conditions are not suitable for pavement striping. Pavement sealer could be applied to the surface of the pavement to prepare the road surface for the new striping. Although the use of asphalt sealer can help in these circumstances, striping may not be guaranteed to last the typical expected life. It is recommended that the road surface be prepared before new striping is applied to these two sections, especially section 1.

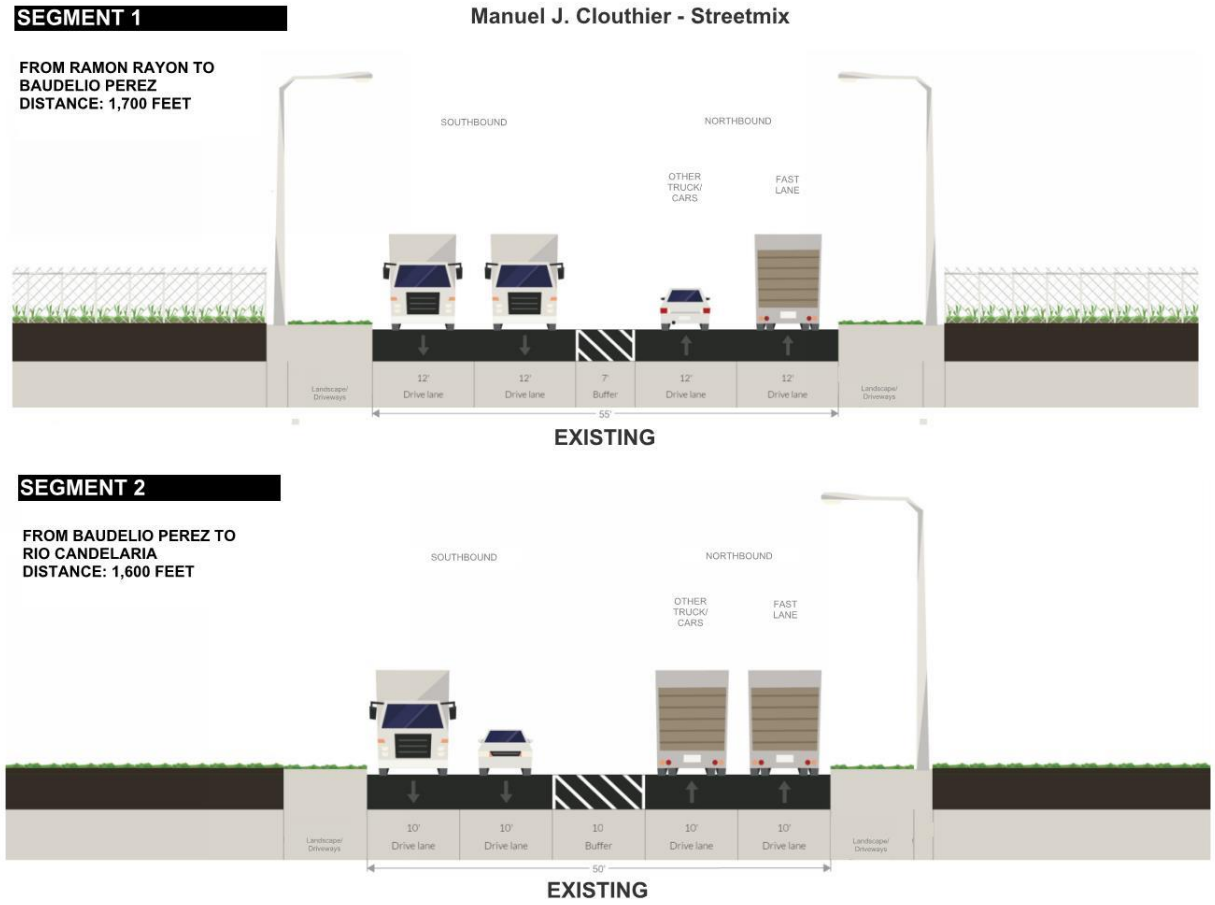

Figure 13: Typical Cross Section Segment 1 and 2

Segments 3 and 4 are very similar and the proposed road configuration will be consistent on both of these segments. There are various driveways and main entrances to industrial warehouses which need to be accounted for during the design.

The majority of the existing K9 inspection shelters are located in segment 2, along the sidewalks or next to the end of pavement. A few driveways and properties are used as K9 inspection drive-thru for the commercial trucks. The recommendation at the stakeholder focus group meetings is to have a raised median to accommodate all K9 inspection and shelters.

There are two options for segment 3. Option A depicts an 11 ft. wide raised median that accommodates three northbound lanes (empty trucks, loaded trucks, and FAST lane trucks). This includes a shared lane (Commercial trucks and vehicles) for traffic traveling southbound from the Aduanas and SEMARNAT office. Option B depicts a 6 ft. wide raised median that accommodates four northbound lanes. Three are the same lane configuration as Option A plus an additional non-commercial (vehicles only) northbound lane. The K9 shelters could be installed on the proposed raised median for both options.

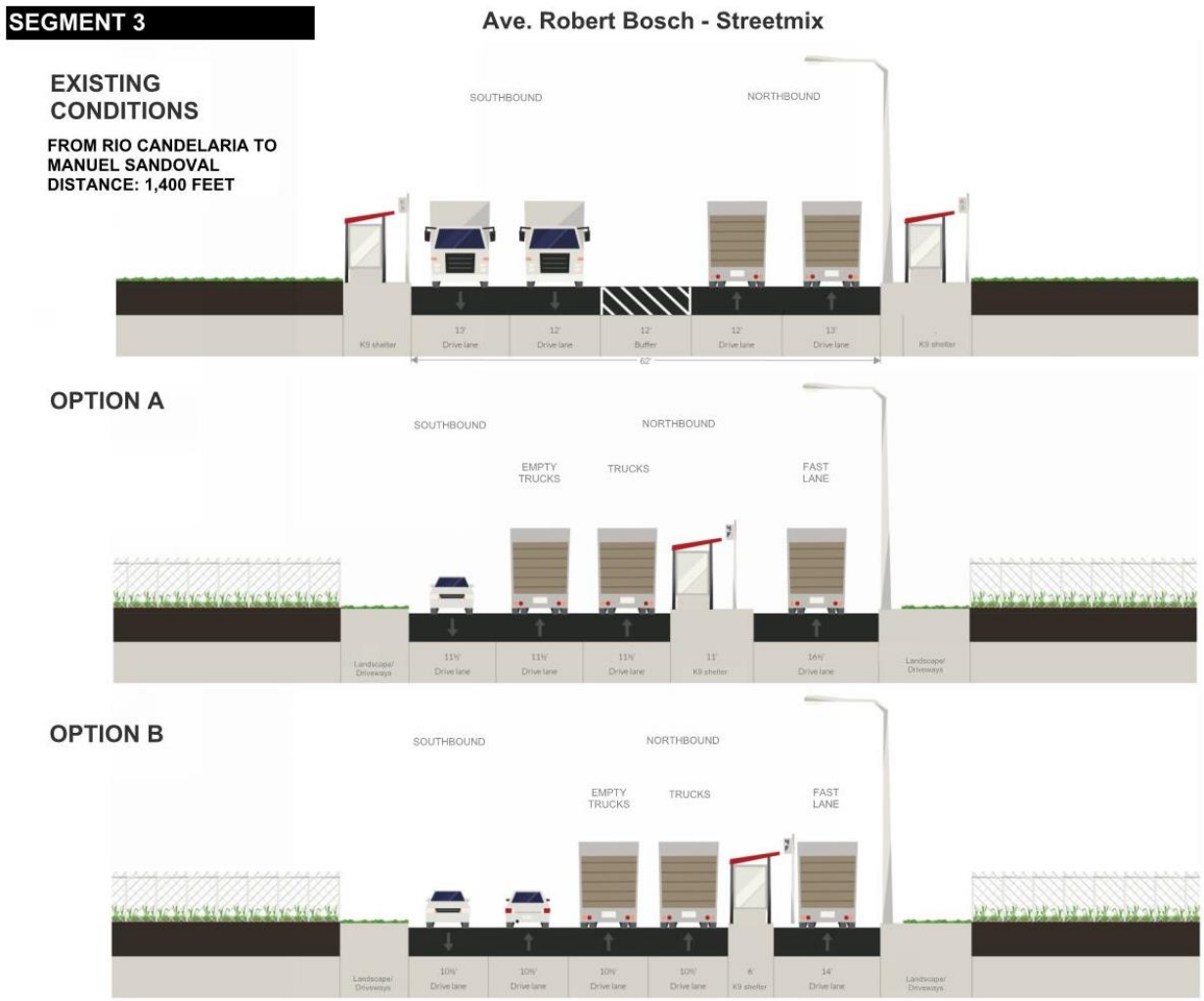

Figure 14: Typical Cross Section for Segment 3

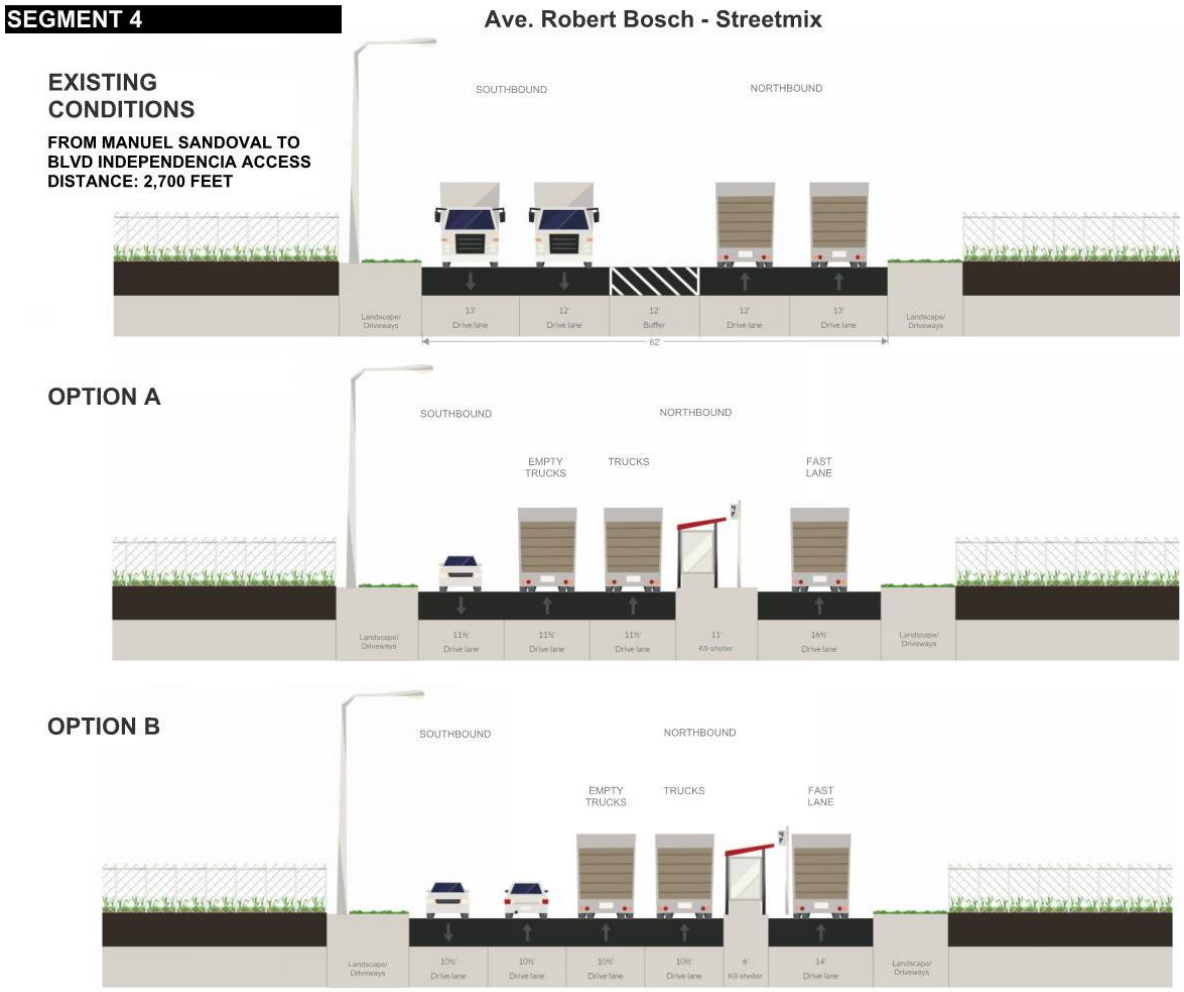

Figure 15: Typical Cross Section for Segment 4

Option 3 and 4 will required overhead signs to indicate the lane designation prior to commercial trucks entering these segments. The project should also account for the installation of no parking signs and yellow striping along the curb to inform the public that parking is forbidden along these sections. The implementation of no parking zones shall be coordinated with the governing agency for enforcement once implemented.

A license plate reader is also included in the project 2 in segments 3 and 5. The purpose of this license plate reader is to detect and identify non-FAST trucks taking advantage of the FAST lane.

Figure 16: License Plate Reader Setup

Median opening along the segments shown below, shall be wide enough to allow vehicles to exit the commercial/warehouse driveways but short enough to prevent commercial trucks (traveling northbound) to use them to switch lanes. The length of the commercial cargo trailer should prevent the trucks to maneuver thru a small opening. Autoturn analysis shall be conducted to design the appropriate opening length, and prevent commercial truck to maneuver under this configuration. In depth traffic study shall be conducted to ensure this lane configuration can support southbound moving away from the Port of Entry. Figure 15 and 16 show the large signs and striping in Segments 3 and 4.

Figure 17: Segment 3 Signing and Striping Layout with License Plate Reader Location.

Figure 18: Segment 4 Signing and Striping Layout.

Segment 5 is the shortest segment. Lane dividers can be installed in this area to separate the existing FAST Lane. A license plate reader shall be installed to detect and identify non-FAST trucks on this lane. The use of lane dividers shall be placed in specific patterns such that trucks exiting Aduanas can access Blvd Independencia. But, this lane divides shall prevent trucks from switching lanes at this point. Figure 18 show the proposed cross section and Figure 19 show the possible striping and lane dividers for section 5.

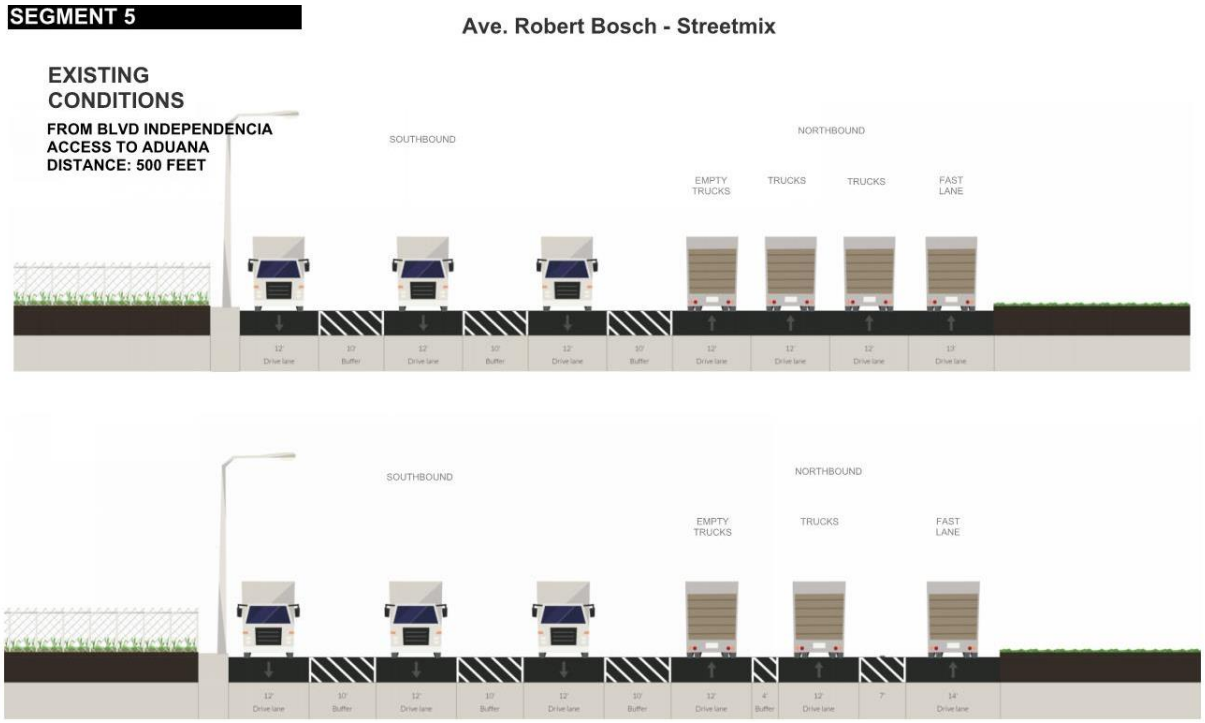

Figure 19: Typical Cross Section for Segment 5

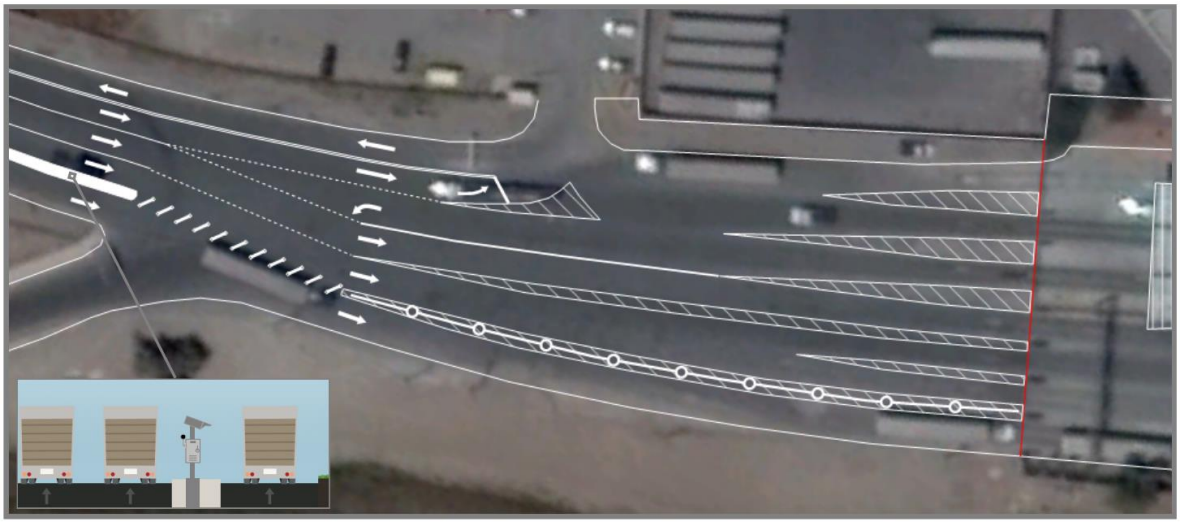

Figure 20: Segment 5 Striping, License Plate Reader and Lane Dividers.

INTELLIGENT TRANSPORTATION SYSTEMS

The Camino Real Regional Mobility Authority (CRRMA) owns fiber optic cable along LP375 Cesar Chavez. This fiber optic cable can be used to integrate some of the ITS devices proposed in Project 3. There is no known ITS infrastructure in Ciudad Juarez to support the proposed Mexico side ITS devices. For both projects 3 and 4, it is anticipated that a single infrastructure will be used for DMS, CCTV cameras, AVI readers, and Bluetooth readers, thus minimizing the footprint and number of poles in the roadscape. Figure 9 illustrates what the proposed structure may look like.

Figure 21: Proposed ITS Structure

PROJECT 3: INTELLIGENT TRANSPORTATION SYSTEMS U.S. SIDE

This project consists of five DMS, five CCTV cameras, five Bluetooth readers and five AVI readers on the U.S. side. The system will monitor and advise truck drivers of traffic conditions at the border crossing. Refer to Appendix A.3 for proposed ITS device locations and ROW ownership.

PROJECT 3A: INTELLIGENT TRANSPORTATION SYSTEMS ON THE BRIDGE

This project will provide design for ITS devices including four bridge DMS, two Bluetooth readers and two AVI readers. This project will guide trucks into the correct lane and will monitor traffic conditions. Control for DMS

will be at the Customs and Border Protection inspection booth and at the City of El Paso Zaragoza Port of Entry building facility.

Figure 10 provides a map with proposed Projects 3, Intelligent Transportation systems U.S side and 3a, Intelligent Transportation Systems on Bridge. Refer to the Appendix A.3 for proposed ITS device locations and ROW ownership. Table 3 illustrates an estimated timeline for Projects 3 and 3a.

Table 4: Time Frame for Project 3 and 3a

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 3: Intelligent Transportation Systems U.S Side							
Time (Months)	2	1	3	1	3	3	13
Project 3a: Intelligent Transportation Systems on Bridge							
Time (Months)	2	1	3	1	3	3	13

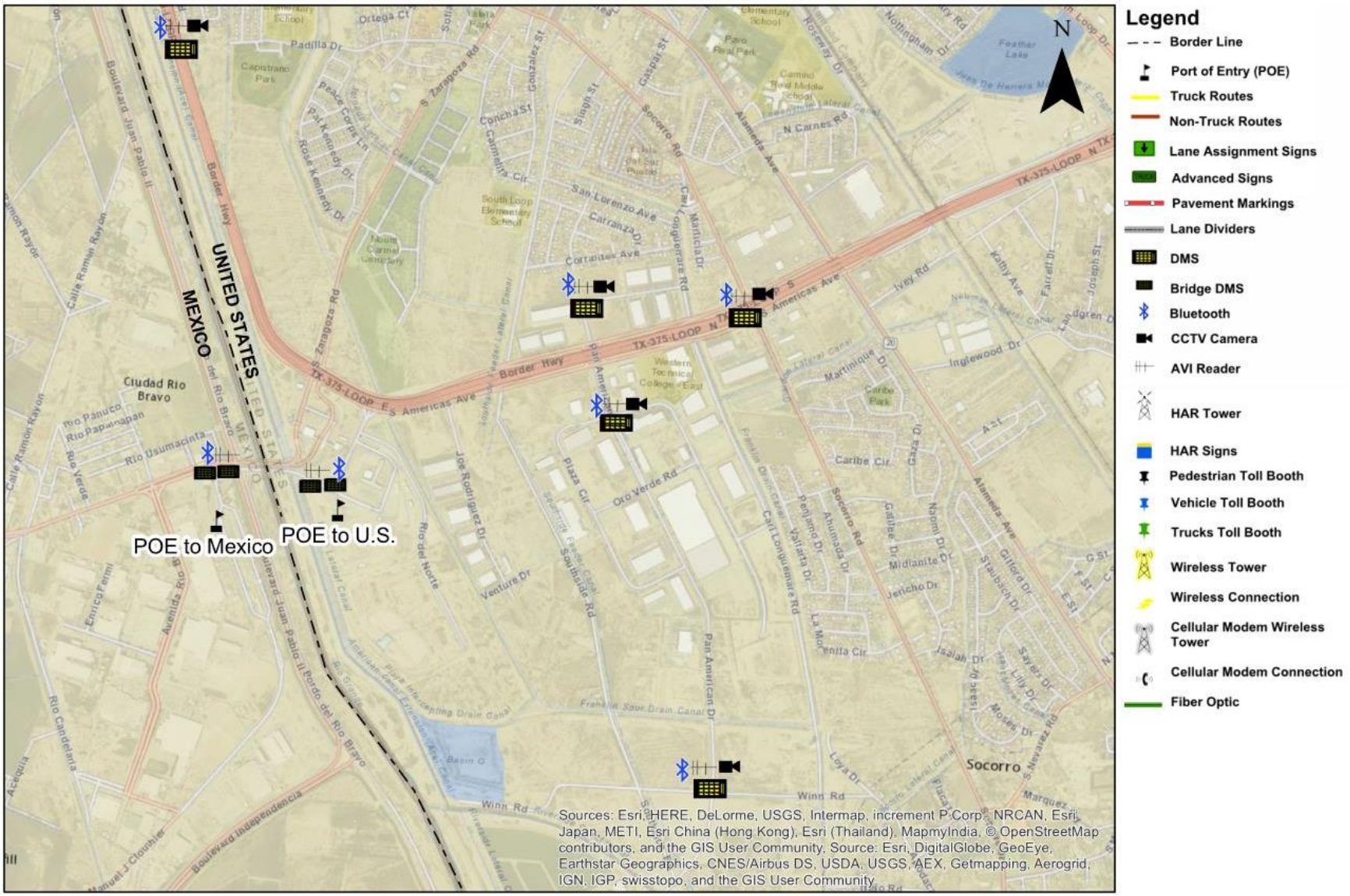

Figure 22: Project 3 Intelligent Transportation Systems U.S Side and Project 3a Intelligent Transportation Systems on Bridge

PROJECT 4: INTELLIGENT TRANSPORTATION SYSTEMS MEXICO SIDE

This project will provide for the design of ITS devices including three DMS, three CCTV cameras, three Bluetooth readers and three AVI readers. This alternative will monitor conditions and provide border crossing times on the Mexico side. Refer to Appendix A.3 for proposed ITS device locations and ROW ownership. Figure 11 provides a map with the proposed project. Table 4 illustrates an estimated timeline for project 4

Table 5: Time Frame for Project 4

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 4: Intelligent Transportation Systems Mexico Side							
Time (Months)	2	1	3	1	3	3	13

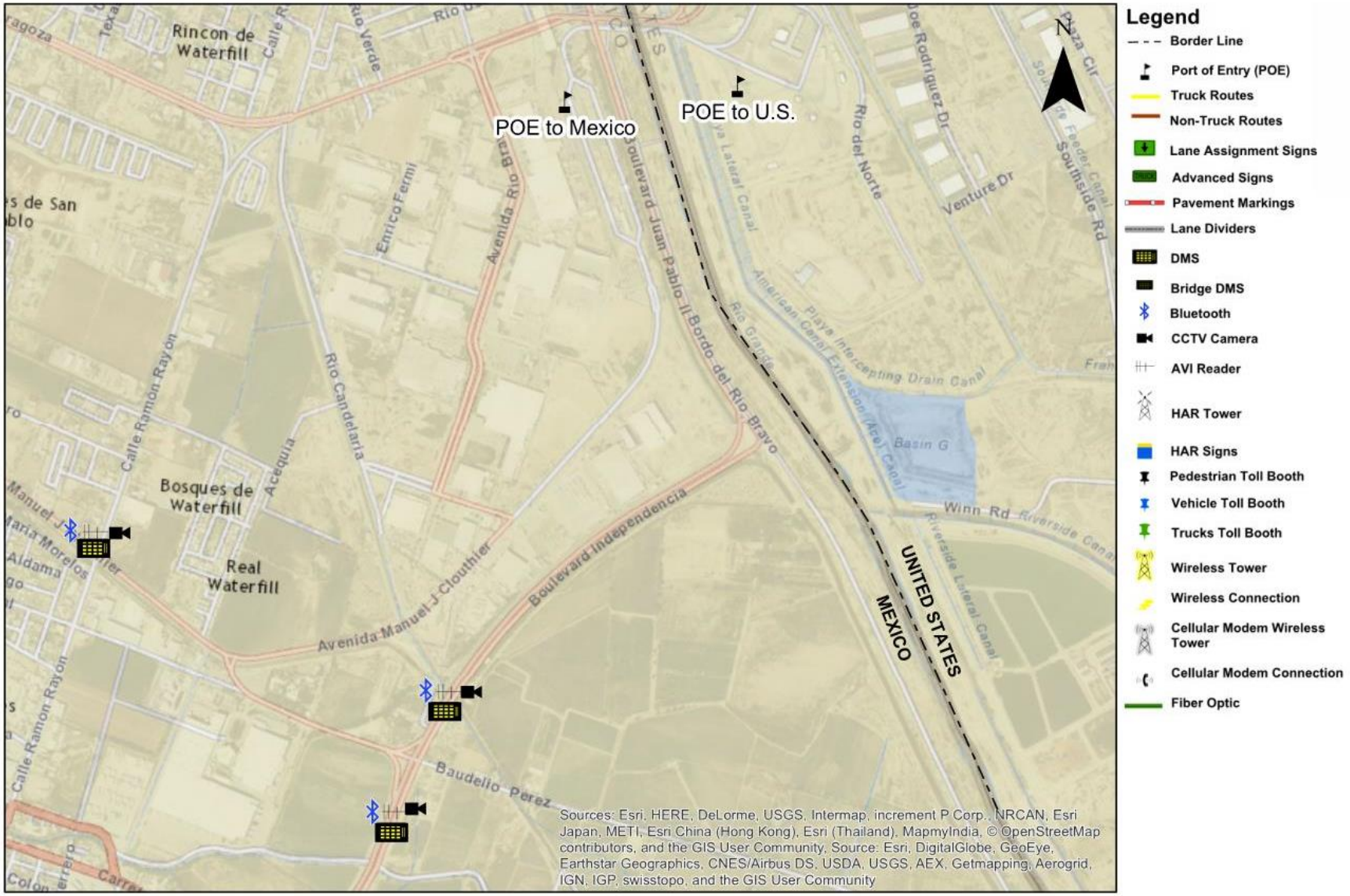

Figure 23: Project 4 Intelligent Transportation Systems Mexico Side

BORDER CROSSING TRAFFIC CONDITIONS DISSEMINATION

Multiple websites provide traffic condition information at the border crossings. However, many sites do not maintain up-to-date information or the information is based on historical data that does not represent current conditions. The City of El Paso has entered into a partnership with Metropia and the Texas Transportation Institute to capture and analyze real time traffic conditions at the border crossings, especially for commercial traffic. The City of El Paso has this information available and wishes to disseminate it to trucking companies.

PROJECT 5: BORDER CROSSING TRAFFIC CONDITIONS DISSEMINATION

One method of public information dissemination is Highway Advisory Radio (HAR). HAR can be installed at the Zaragoza POE facility. With its six mile radius coverage, this short-range radio station will disseminate border crossing traffic conditions to truck drivers in the area. Refer to Appendix A.4 for proposed HAR station location and signs. Figure 14 provides a map with the proposed traffic conditions dissemination which included HAR station and signs. Refer to Appendix A.4 for proposed HAR tower and signs locations and ROW ownership.

In addition, the City of El Paso would like to disseminate border crossing traffic conditions thru SMS text messages. The City would like to develop software that allows truck drivers or trucking company dispatchers to register through a website to receive traffic condition alerts. Users can sign up to receive alerts for certain times of day on selected days of the week. The software will be able to notify subscriber users travel times and current conditions via text messages. Truck drivers will be able to register to receive current conditions updated at certain times of day by text message alert. Figure 12 shows the sample text message users will receive once registered. Figure 13 shows the website registration sample to receive text message alerts. Table 5 illustrates an estimated timeline for project 5.

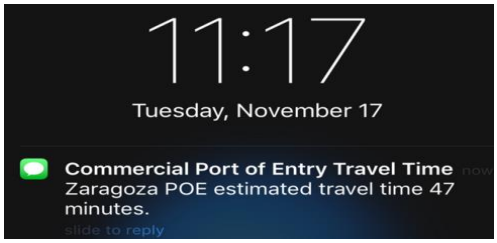

Figure 24 Sample Text Message

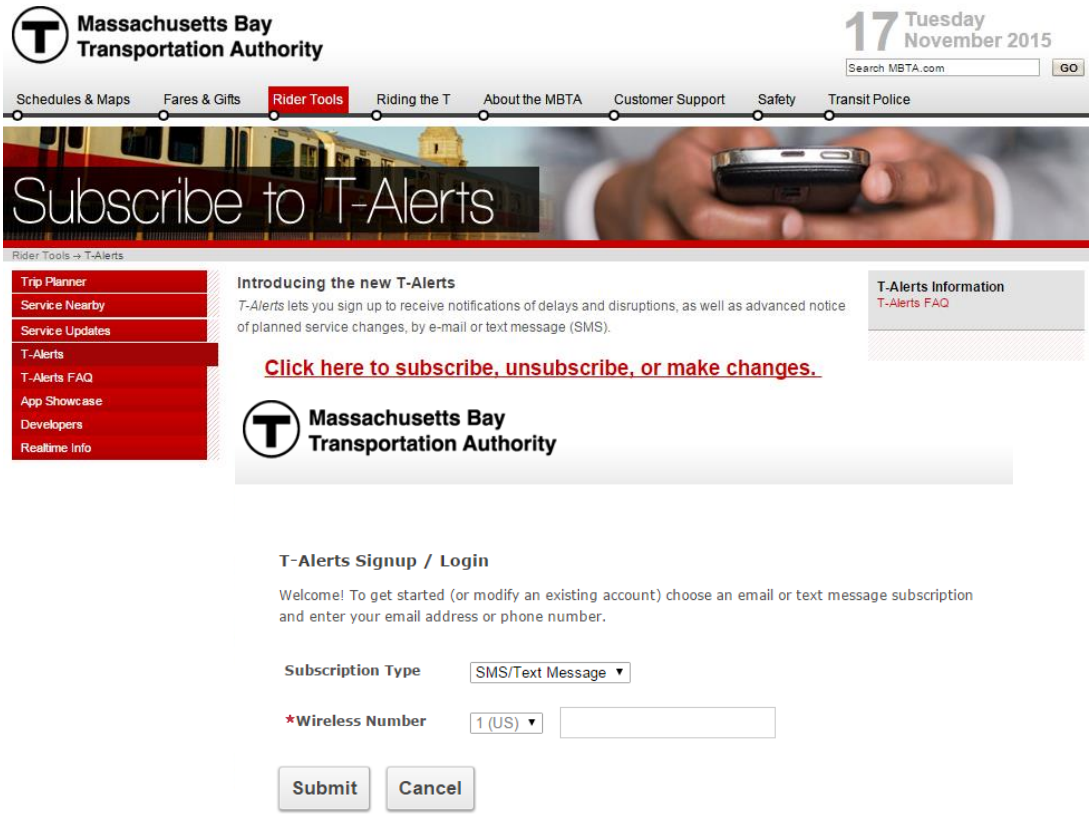

Figure 25: Website Sample

(Photo credit: http://www.mbta.com/rider_tools/t_alerts/)

Table 6: Time Frame for Project 5

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 5: Border Crossing Traffic Conditions Dissemination U.S. Side							
Time (Months)	2	1	3	1	3	1	11
Project 5: Border Crossing Traffic Conditions Dissemination Mexico Side							
Time (Months)	2	1	3	1	3	1	11

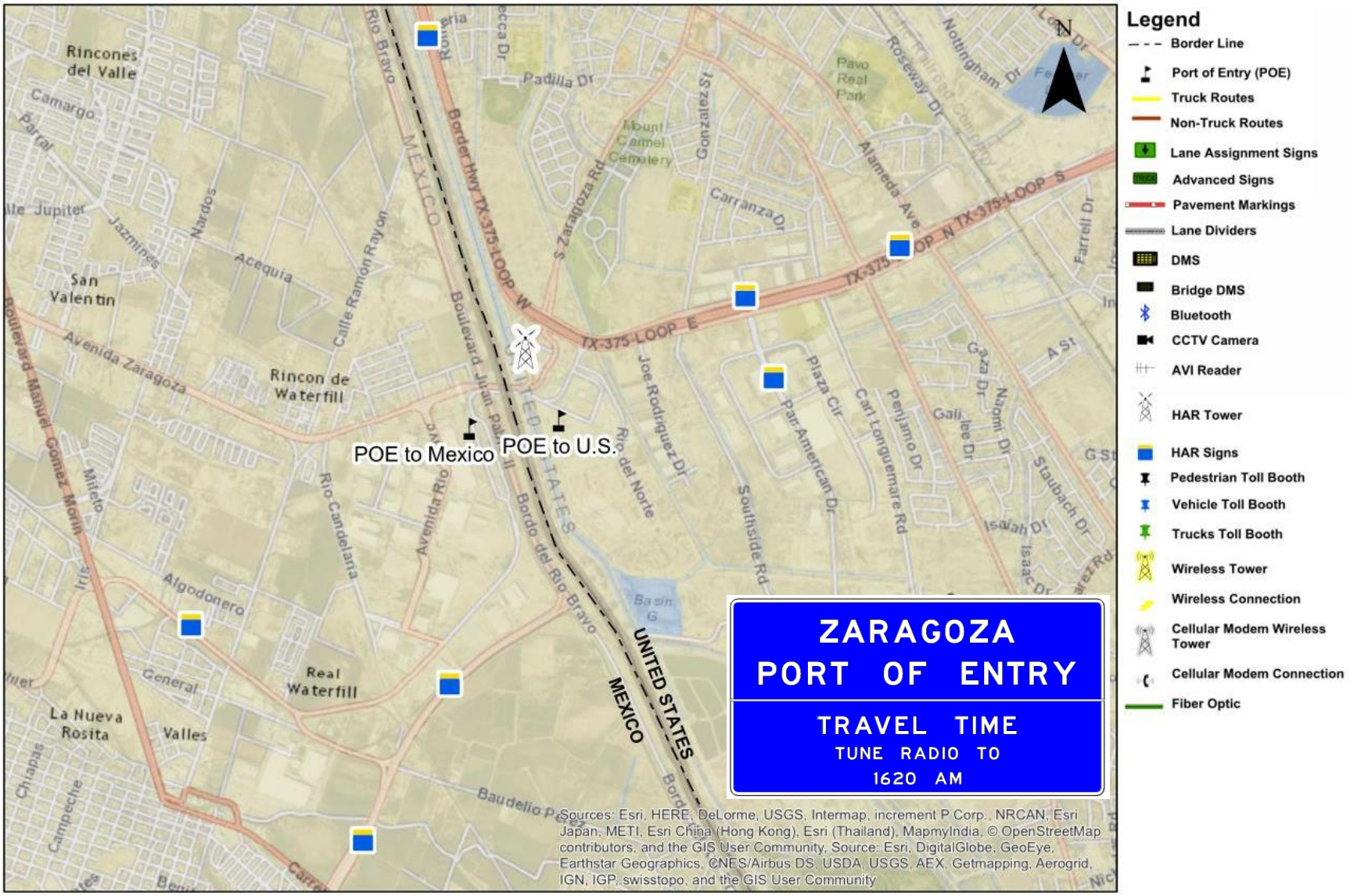

Figure 26: Project 5 Border Crossing Traffic Conditions Dissemination

ELECTRONIC TOLL COLLECTION SYSTEM

The City of El Paso tolls travelers leaving the U.S. at the Santa Fe, Stanton, and Ysleta-Zaragoza bridges. Santa Fe bridge toll operations are for pedestrians only. Stanton tolling is for pedestrians and passenger vehicles and busses, and Ysleta-Zaragoza tolling operations are for pedestrian, passenger vehicles and trucks. Existing tolling operations consist of a manned toll booth. The City of El Paso wants to improve customer service by using a system that's more efficient, reliable, FASTer and automated (i.e. not dependent on operators).

The City of El Paso is considering an Electronic Toll Collection (ETC) system. The ETC may consist of multiple devices such as cash collectors, Near Field Communication (NFC) via cell phones, transponders, and prepaid cards. To determine the most appropriate ETC understanding requirements of the users is critical. Most travelers are daily POE crossers. For these users, the ETC might use a transponder, an electronic "card" associated with an account that can be recharged with additional funds when low. An app could be developed to allow the users quick account management, i.e., check balance, recharge (add funds), etc. Smart phones can also be used as a point of sale at the toll booth using NFC technology.

However, for travelers wary of technology or not technology savvy, and non-frequent travelers, transponders and apps are probably not practical, i.e., cash remains the best option for these users.

PROJECT 6: ELECTRONIC TOLL COLLECTION SYSTEM

This project consists of upgrading the tolling system to an unmanned ETC at all border crossings on the U.S. side managed and operated by the City of El Paso. The best solution for the City may be a combination of multiple technologies. For example, tollbooths on all three bridges would have the capability of functioning using transponders. Transponders can be made available via vending machines at the POE. This transponder would be compatible with the TxTAG system, such that it can be used at the border crossing as well as all toll roads in El Paso.

The City of El Paso may also consider NFC via cell phones. POE toll booths shall be equipped with NFC technology, allowing cell phones in close proximity to pay toll fares. An app would be developed to allow traveler to manage their accounts.

For non-frequent users a minimum of one toll booth on the pedestrian side and at least one on the vehicle side shall accept cash. The cash collector device cannot issue change and accepts coins and bills only. Not providing change will encourage users to use innovate methods of payment and eventually make the system more automated.

A security revolving glass door option can be used at each booth, which should stop after 120 degrees to allow the passing of one pedestrian after completing the toll collection. Pedestrian crossing with large baggage or belongings and handicapped users may experience some limitations using the one-user revolving door. This option might need an additional traditional gate or a larger revolving door. A large revolving door can accommodate these users but could allow the passing of more than one pedestrian at a time and occupy large space at the POE. Large revolving doors should account for the detection of unauthorized pedestrian system (2 persons' entry) to control unauthorized pedestrian passer and to enforce the one passage only. Revolving glass door are usually installed indoors or at facility entrances, which means that a proper shelter should be installed if not available. Artwork can be installed at the frosting of the glass doors. See Figure 15 for proposed pedestrian toll booth.

See Figure 16 for sample vehicle toll booth.

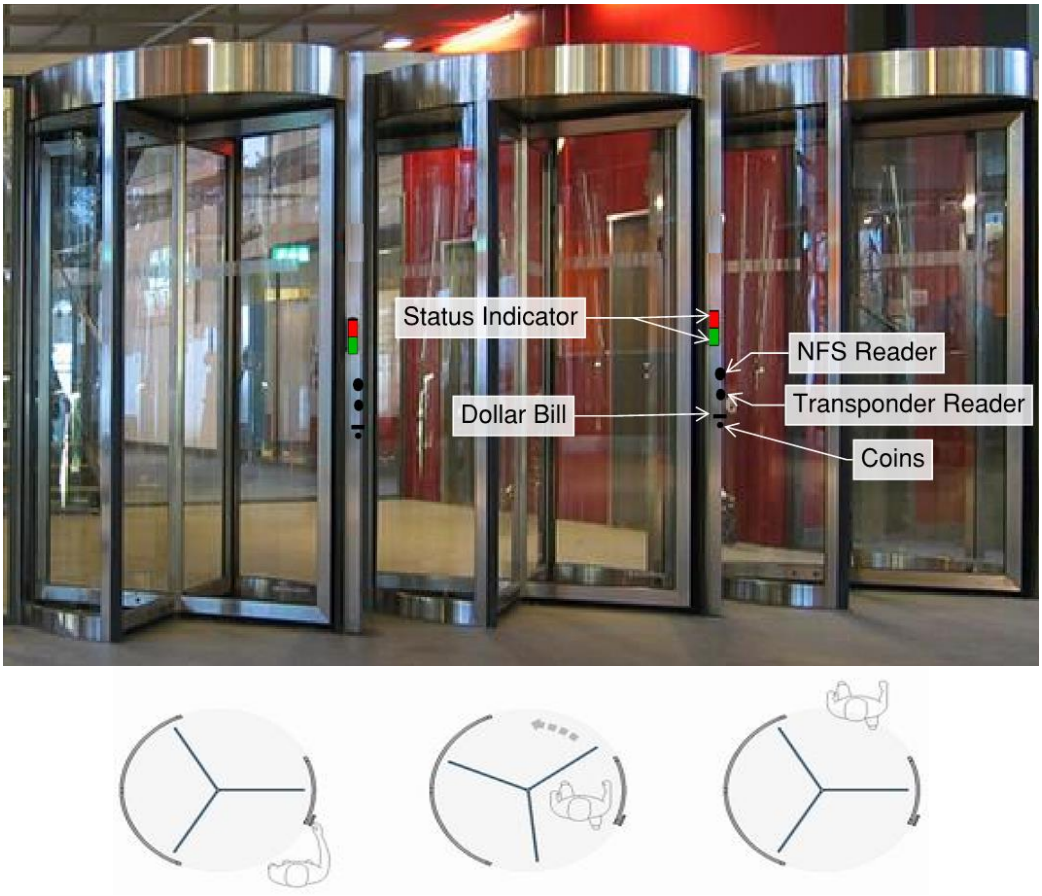

Figure 27: Proposed Toll Booth Collector for Pedestrians

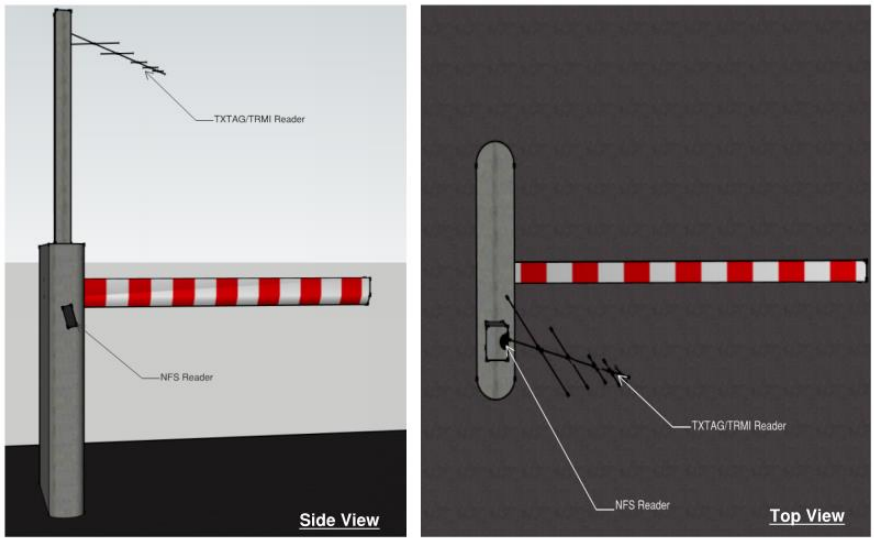

Figure 28: Proposed Toll Booth Collector for Vehicles and Trucks

Multiple toll booth technologies will require integration and connectivity into a central control system at a location to be defined by the City. Using Ethernet technology, all the proposed technologies (NFC, transponders/readers, cash collectors, transponder vending machines, vehicular and pedestrian gates) can be readily integrated by a systems integrator (Software Development). All devices utilize ID numbers that can be stored in a central database, allowing for efficient management and processing of data and account information. The back office / central software, servers and other communication equipment shall have dedicated room of about 20ft x 40ft in size with protected with backup power, uninterruptable power supply, server racks, independent AC unit, and three workstations for technicians and system support maintenance team.

In summary, all the toll booth equipment shall be integrated via Ethernet to a central and local database. The system integrator shall develop software to process transactions and manager users' accounts.

Figure 17 provides the proposed project. See Figure 18 for proposed Electronic Toll Collection System Network Connectivity. Refer to Appendix A.5 for proposed ETC locations and ROW ownership. Table 6 illustrates an estimated timeline for project 6

Table 7: Time Frame for Project 6

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Project 6: Electronic Toll Collection System							
Time (Months)	2	1	3	1	3	3	13

Stanton Port of Entry

Ysleta-Zaragoza Port of Entry

Santa Fe Port of Entry

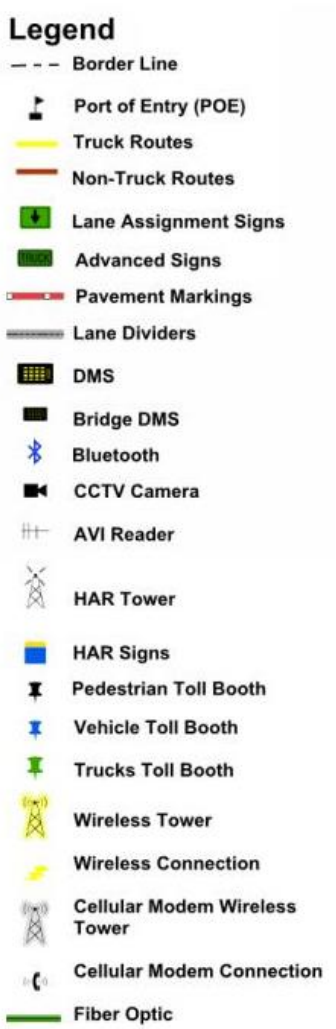

Figure 29: Project 6 Electronic Toll Collection System

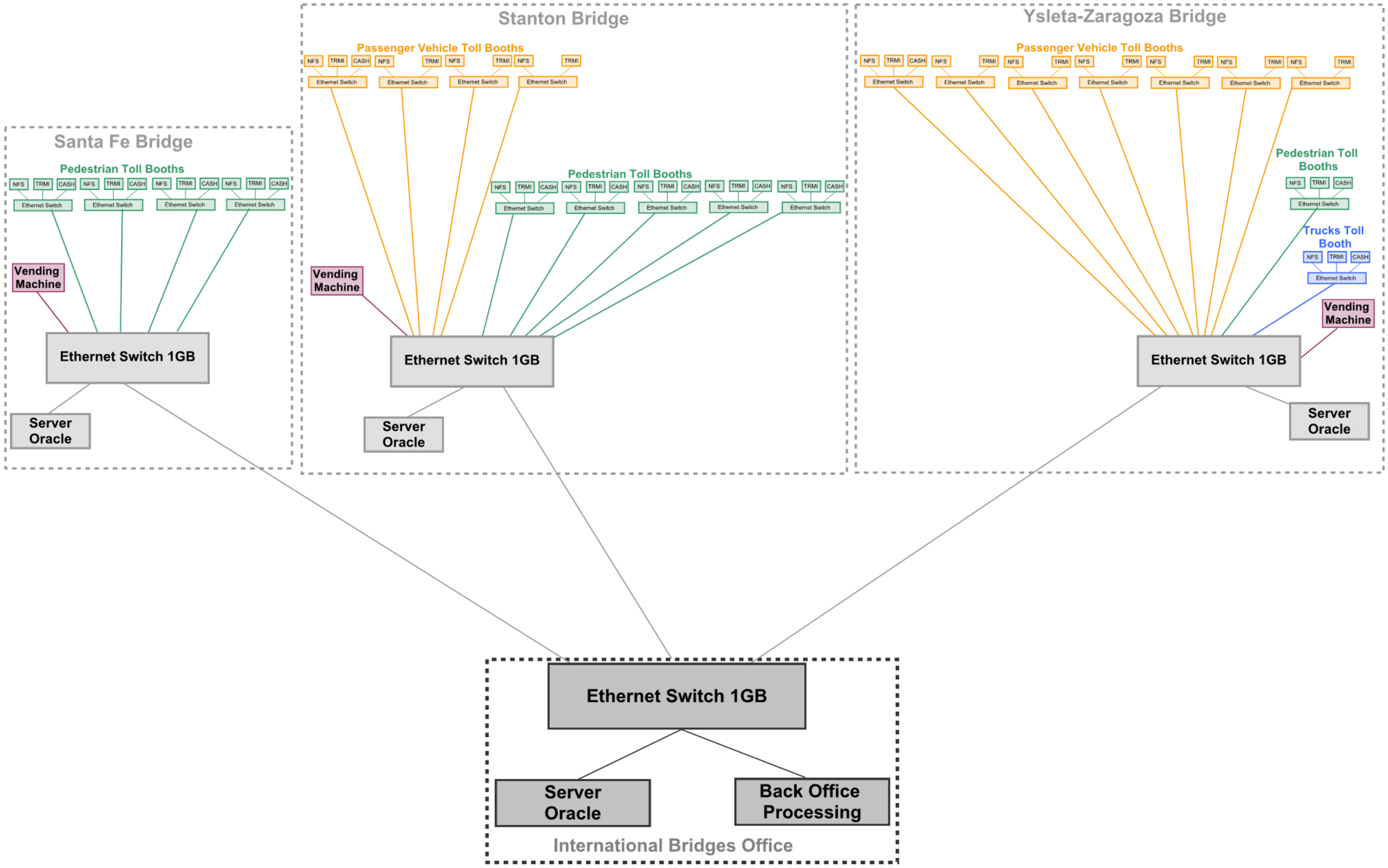

Figure 30: Toll Collection System Network Connectivity

COMMUNICATION INFRASTRUCTURE COST COMPARISON OF WIRELESS VERSUS FIBER OPTICS.

The systems described in Projects 3 through 6 can connect to the City communications network using existing fiber optic cable infrastructure, wireless Ethernet or cellular. This section of the report describes the advantages and disadvantages of each technology, compares costs, and lists assumptions associated with the evaluation of the three communication technologies.

FIBER OPTIC CABLE

Assumptions – The CRRMA owns fiber optic cable along Loop 375 Cesar Chavez Highway. DMS, CCTV cameras, Bluetooth and AVI readers can be readily connected by installing fiber optic jumper cables to CRRMA's main fiber trunk. Underground infrastructure (i.e. conduit and ground boxes) will have to be installed.

Advantages of fiber optic cable are:

1. Provides highest-quality CCTV camera images.
2. DMS messages can be displayed with zero delay.
3. There is no limitation on the size of data that can be transmitted on the network.
4. Communications to all CCTV cameras, DMS or other devices will be available regardless of weather conditions.
5. Provides capacity for other uses such as City WAN emergency backup and lease/revenue source.
6. Provides long-term expandability and flexibility.

Disadvantages of fiber optic cable are:

1. Conduit is required, possibly resulting in escalated installation costs, particularly in a utility-heavy environment.
2. Installation of fiber optic cable in existing conduit on the Ysleta-Zaragoza Bridge will require agreements with telecommunication companies and may require an international agreement.
3. Require agreement with TxDOT for installation in TxDOT's ROW.

Table 7 illustrates an estimated timeline for projects 3, 3a and 4.

Table 8: Time Frame for Fiber Optic Cable Infrastructure

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Fiber Optic Cable Infrastructure U.S. Side for Project 3							
Time (Months)	2	1	3	1	3	3	13
Fiber Optic Cable Infrastructure U.S. Side for Project 3a							
Time (Months)	2	1	3	1	3	3	13
Fiber Optic Cable Infrastructure Mexico Side for Project 4							
Time (Months)	2	1	3	1	3	3	13

Figure 19 and 20 provides the fiber optic cable locations.

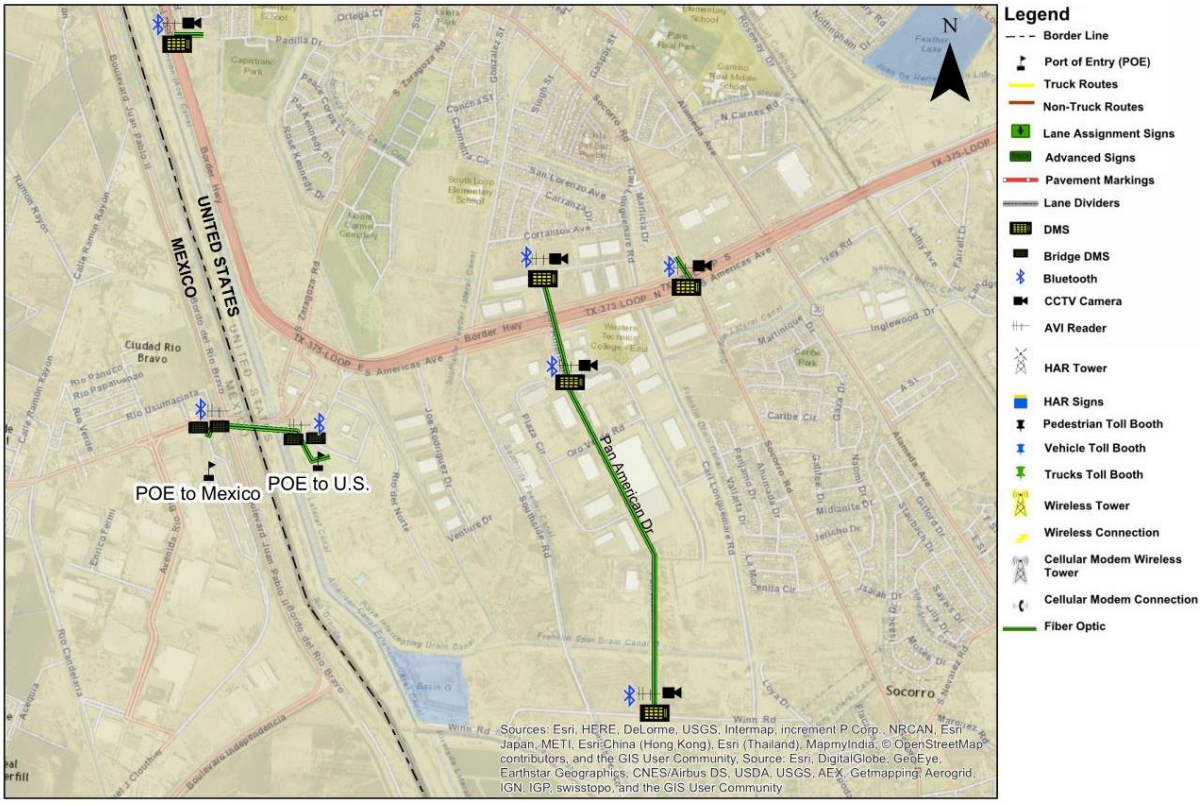

Figure 31: Fiber Optic Cable U.S Side

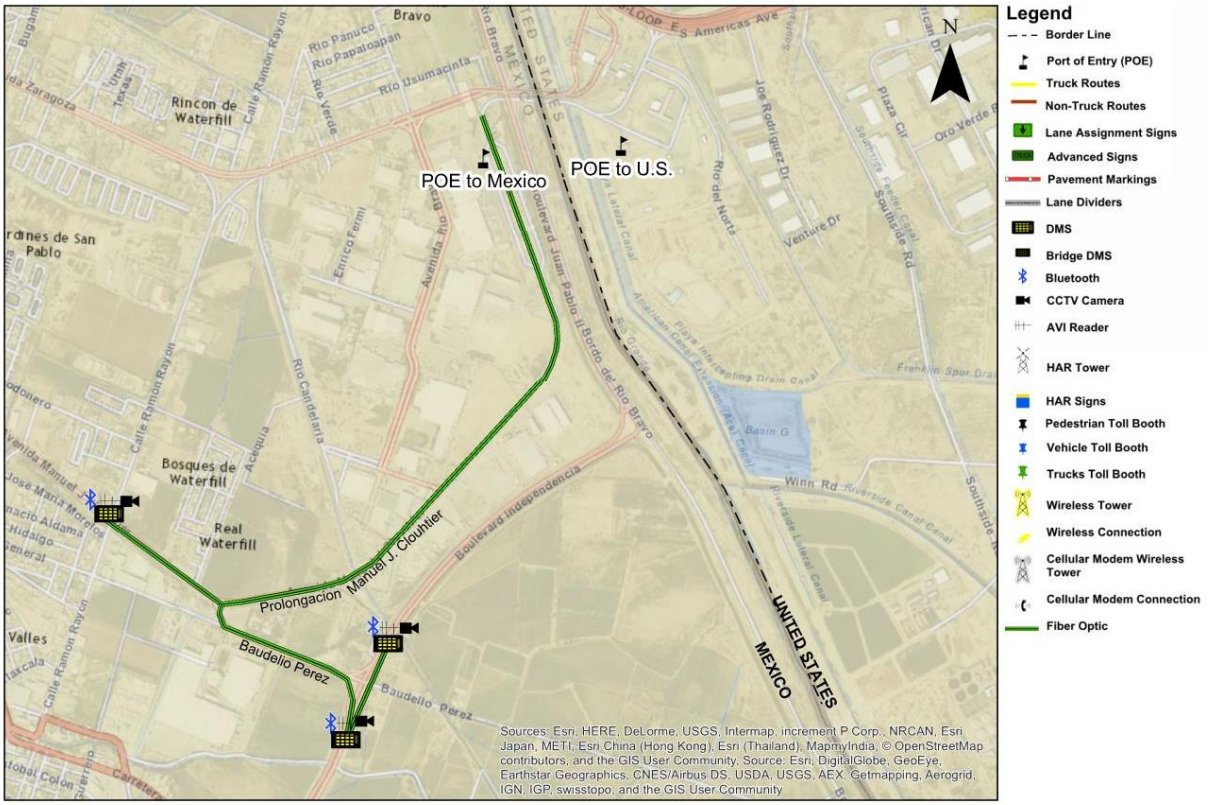

Figure 32: Fiber Optic Cable Mexico Side

WIRELESS ETHERNET

Assumptions – An Ethernet radio system could be installed at each ITS device site and one central tower/pole at the Zaragoza POE facility building. One tower could be installed on the U.S. side and another on the Mexico on side, as shown on Figures 21 and 22.

Advantages of wireless Ethernet are:

1. Cost effective (minimal installation costs), re-deployable and portable.
2. Does not require expensive underground infrastructure.
3. Technology is rapidly improving, providing future migration opportunities for the City.

Disadvantages of wireless Ethernet are:

1. Limited bandwidth for video transmissions.
2. Require dedicated frequency for camera subsystem.
3. Video images are not always of the highest quality since signals compete for bandwidth.
4. Frequencies are subject to interference in heavily populated wireless environments.
5. Requires wireless technology-specific expertise to diagnose, troubleshoot and maintain.

6. Can be affected by severe weather events.

Table 8 shows the time need it for fiber optic cable infrastructure for projects 3, 3a and 4.

Table 9: Time Frame for Wireless Connection

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Wireless Connection U.S. Side for Project 3							
Time (Months)	2	1	1	1	3	1	9
Wireless Connection U.S. Side for Project 3a							
Time (Months)	2	1	1	1	3	1	9
Wireless Connection Mexico Side for Project 4							
Time (Months)	2	1	1	1	3	1	9

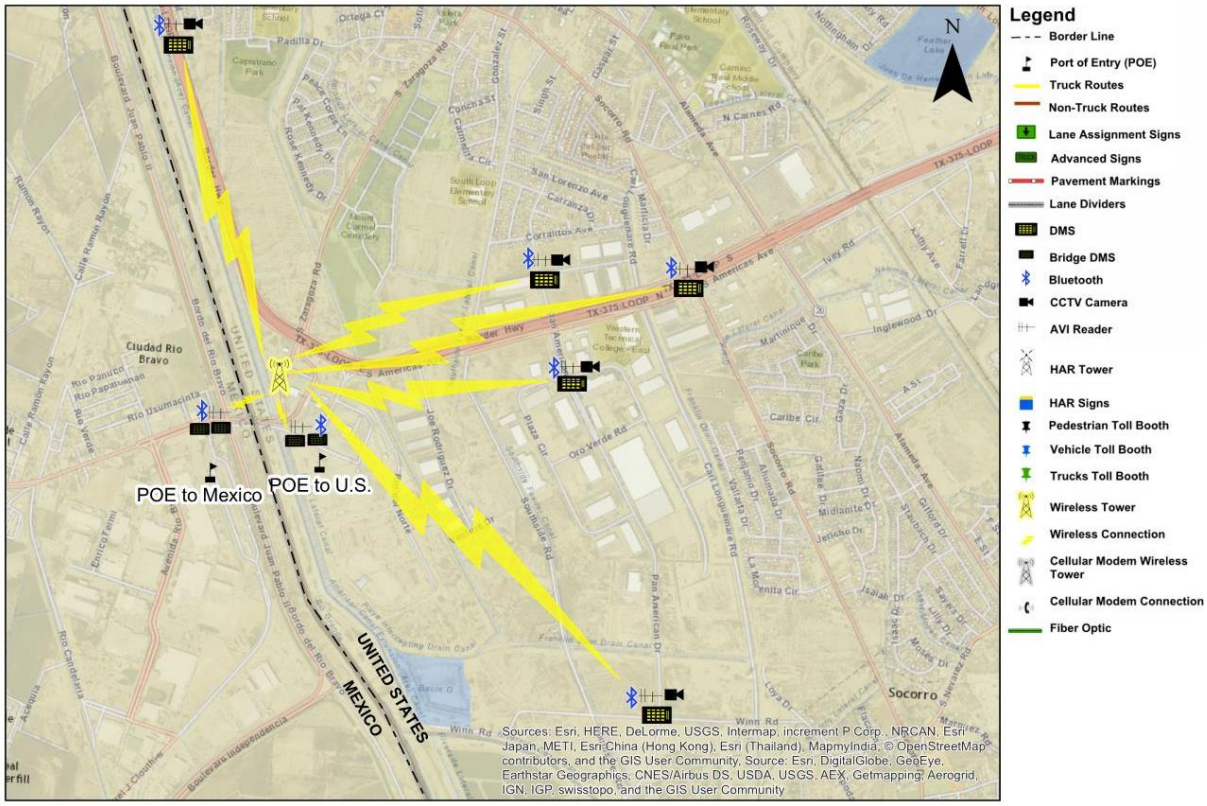

Figure 33: Wireless Ethernet U.S Side

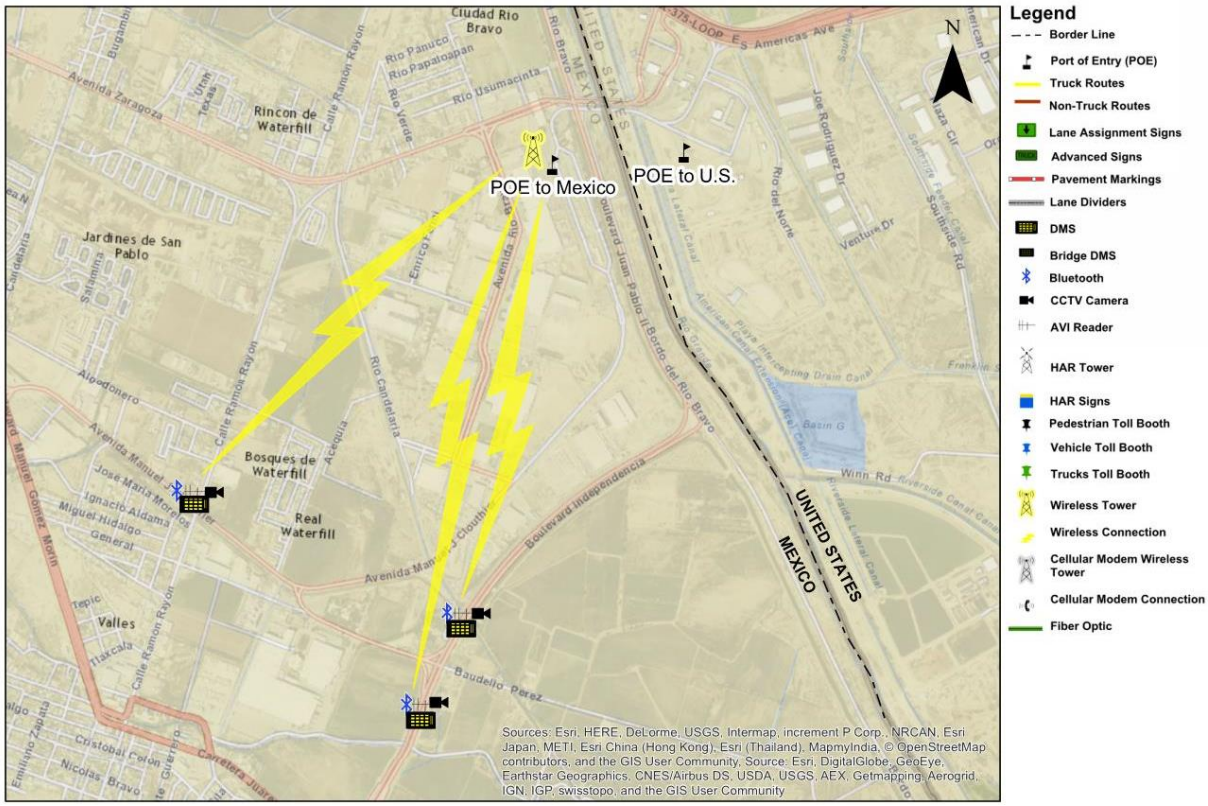

Figure 34: Wireless Ethernet Mexico Side

CELLULAR

Assumptions – This option uses wireless cellular devices in conjunction with a cellular wireless data service with a monthly internet access service fee. One cellular device per ITS device site will be required. This option does not require any equipment at the Zaragoza POE facility. All that is needed is a computer with Internet connectivity.

Advantages of cellular are:

1. Minimal costs include a modem and monthly service fee
2. The Cellular Carrier is responsible for the maintenance of the Internet connection.

Disadvantages of cellular are:

1. Communication stability depends on cellular carrier availability and reliability.
2. Video images and system reliability depend on number of cellular carrier customers in the area.
3. Cellular services can be affected during severe weather events.
4. Possible limitation on the size of data transmitted on the network at higher speeds.

Table 9 shows the time needed for fiber optic cable infrastructure for projects 3, 3a and 4.

Table 10: Time Frame for Cellular Connection

Phase	Secure MPO Funds	Hire Engineering Firm	Project Design	Bidding Process	Contractor Lead Time	Construction	Total
Cellular Connection U.S. Side for Project 3							
Time (Months)	2	1	1	1	0	1	6
Cellular Connection U.S. Side for Project 3a							
Time (Months)	2	1	1	1	0	1	6
Cellular Connection Mexico Side for Project 4							
Time (Months)	2	1	1	1	0	1	6

Figures 23 and 24 provide the cellular modem locations

.

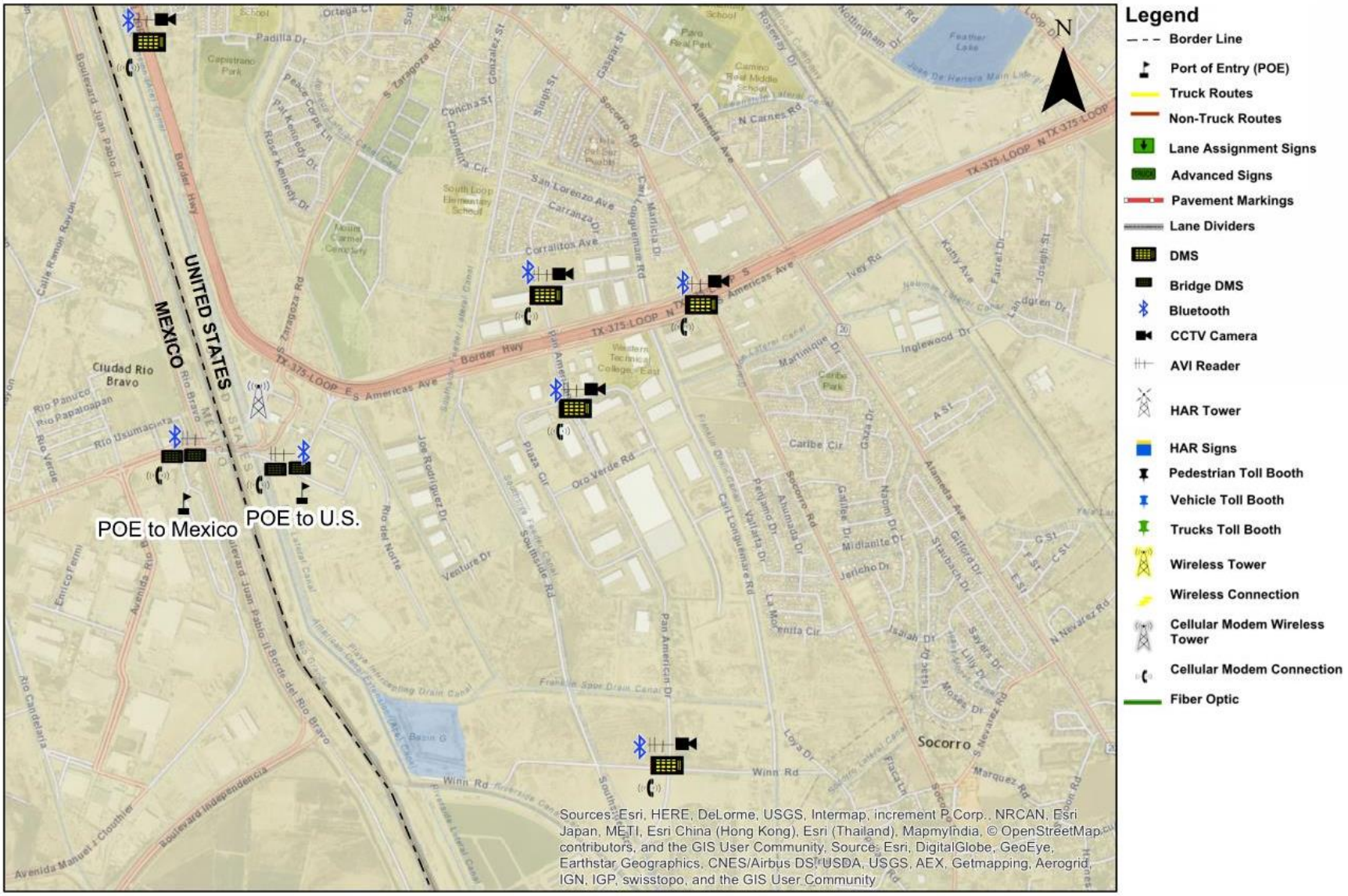

Figure 35: Cellular Modem U.S. Side

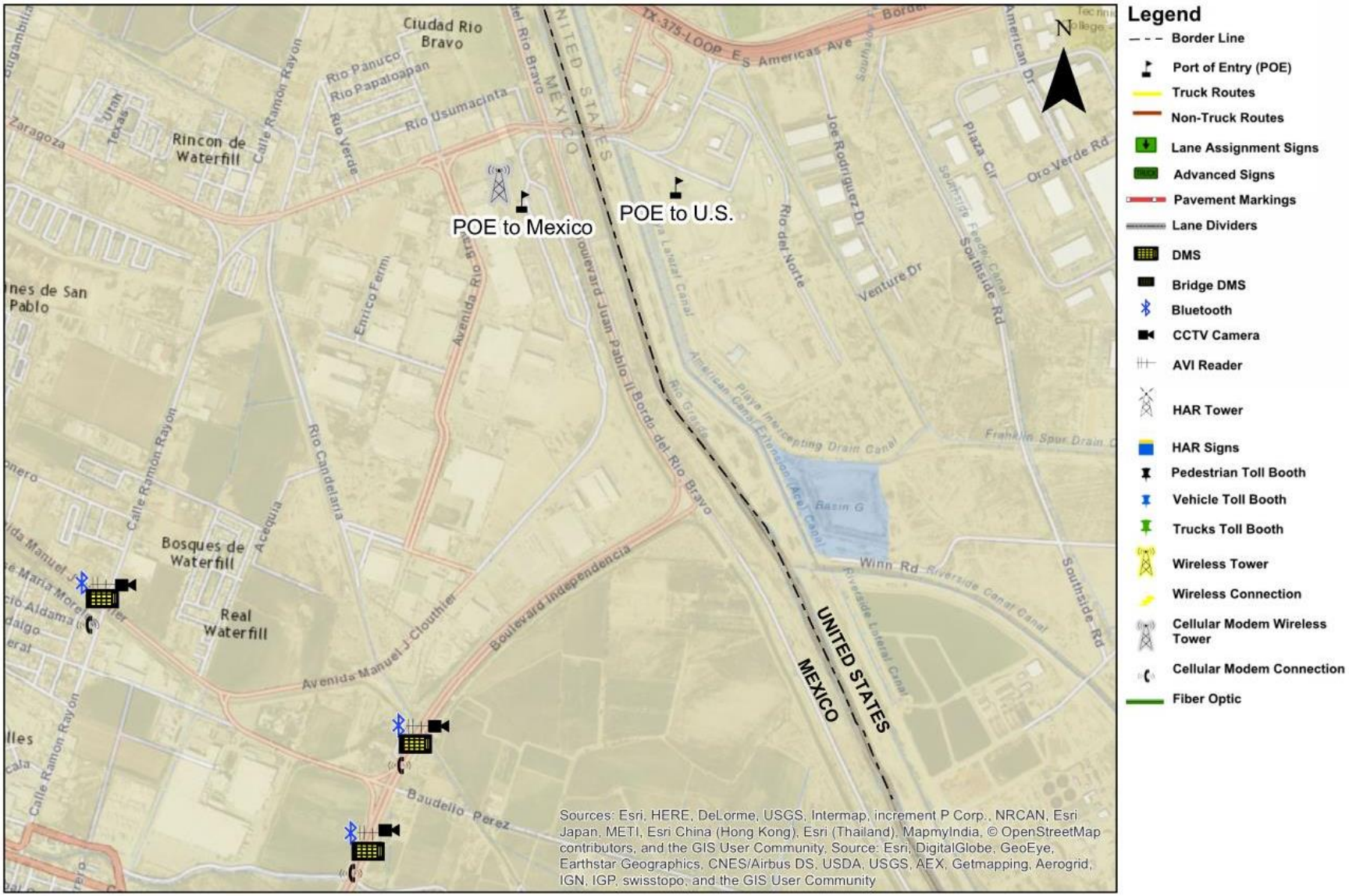

Figure 36: Cellular Modem Mexico Side

COST ESTIMATE

Table 1 depicts the complete project scope and probable cost for all projects identified.

CONCLUSIONS

This Preliminary Engineering Report documents and identifies projects that have the purpose of improving the environment for commercial traffic entering and leaving the United States. All of the identified projects will be implemented at the Ysleta-Zaragoza International Truck Bridge. These projects consist of a combination of Intelligent Transportation System (ITS), signing, striping, wireless communication to mobile devices, and unmanned toll collection systems.

APPENDIX

A.1 PROPOSED PROJECTS COST ESTIMATES

Table 11: Summary and Cost Estimate

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 1)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$6,309.94	$2,400.00	
	502	2001	MOBILIZATION	LS	1	$3,927.76	$3,927.76			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	1200	$0.44	$528.00			
	666	6012	REFL PAV MRK TY I (W)4"(SLD)(100MIL)	LF	5500	$0.40	$2,200.00			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	1200	$0.12	$144.00			
	666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	5500	$0.09	$495.00			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	6	$38.56	$231.36			
	666	6224	PAVEMENT SEALER 4"	LF	2000	$0.20	$400.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	2000	$0.21	$420.00			
			LANE DIVIDER	EA	500	$79.95	$39,975.00			
SUBTOTAL						*	$53,024.70	$6,309.94	$2,400.00	$61,734.63
Engineering and Contingencies 8 %										$4,938.77
Inflation 10%										$6,667.34
TOTAL										$73,340.75

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 2)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$1,316.51	$1,200.00	
	502	2001	MOBILIZATION	LS	1	$358.40	$358.40			
Signing	636	6001	ALUMINUM SIGNS (TY A)	SF	64	$53.59	$3,429.76			
	644	6049	IN SM RD SN SUP&AM TYS80(1)SB(U-EXAL)	EA	2	$1,275.00	$2,550.00			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	500	$0.44	$220.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	500	$0.12	$60.00			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	2	$83.93	$167.86			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	2	$38.56	$77.12			
SUBTOTAL						*	$11,063.14	$1,316.51	$1,200.00	$13,579.65
Engineering and Contingencies 8 %										$1,086.37
Inflation 10%										$1,466.60
TOTAL										$16,132.63

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 3)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$5,884.84	$1,200.00	
	502	2001	MOBILIZATION	LS	1	$3,663.15	$3,663.15			
Sigining	636	6001	ALUMINUM SIGNS (TY A)	SF	96	$53.59	$5,144.64			
	644	6049	IN SM RD SN SUP&AM TYS80(1)SB(U-EXAL)	EA	3	$1,275.00	$3,825.00			
Striping	416	2006	DRILL SHAFT (48 IN)	LF	30	$28.53	$855.90			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	180	$18.01	$3,241.80			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	400	$4.73	$1,892.00			
	650	6038	INS OH SN SUP(35 FT CANT)	EA	1	$22,345.00	$22,345.00			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	7	$83.93	$587.51			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	7	$38.56	$269.92			
SUBTOTAL						*	$49,452.48	$5,884.84	$1,200.00	$56,537.32
Engineering and Contingencies 8 %										$4,522.99
Inflation 10%										$6,106.03
TOTAL										$67,166.34

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 4)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$2,139.79	$1,200.00	
	502	2001	MOBILIZATION	LS	1	$1,331.96	$1,331.96			
Signing	636	6001	ALUMINUM SIGNS (TY A)	SF	128	$53.59	$6,859.52			
	644	6049	IN SM RD SN SUP&AM TYS80(1)SB(U-EXAL)	EA	4	$1,275.00	$5,100.00			
Striping	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	4	$83.93	$335.72			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	4	$38.56	$154.24			
SUBTOTAL						*	$17,981.44	$2,139.79	$1,200.00	$21,321.23
Engineering and Contingencies 8 %										$1,705.70
Inflation 10%										$2,302.69
TOTAL										$25,329.62

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 5)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	2	$4,200.00	$8,400.00	$13,475.14	$2,300.00	
	502	2001	MOBILIZATION	LS	1	$8,387.88	$8,387.88			
Signing	636	6001	ALUMINUM SIGNS (TY A)	SF	128	$53.59	$6,859.52			
	636	6003	ALUMINUM SIGNS (TY O)	SF	500	$40.72	$20,360.00			
	644	6049	IN SM RD SN SUP&AM TYS80(1)SB(U-EXAL)	EA	4	$1,275.00	$5,100.00			
	416	2006	DRILL SHAFT (48 IN)	LF	80	$28.53	$2,282.40			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	360	$18.01	$6,483.60			
	540	2005	TERMINAL ANCHOR SECTION	EA	2	$938.67	$1,877.34			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	2	$2,488.89	$4,977.78			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	600	$4.73	$2,838.00			
	650	6038	INS OH SN SUP(35 FT CANT)	EA	2	$22,345.00	$44,690.00			
Striping	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	8	$83.93	$671.44			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	8	$38.56	$308.48			
SUBTOTAL						*	$113,236.44	$13,475.14	$2,300.00	$129,011.58
Engineering and Contingencies 8 %										$10,320.93
Inflation 10%										$13,933.25
TOTAL										$153,265.76

PROJECT 1: SIGNING AND STRIPING US SIDE (SECTION 6)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	2	$4,200.00	$8,400.00	$7,364.45	$2,300.00	
	502	2001	MOBILIZATION	LS	1	$4,584.16	$4,584.16			
Signing	636	6001	ALUMINUM SIGNS (TY A)	SF	64	$53.59	$3,429.76			
	636	6003	ALUMINUM SIGNS (TY O)	SF	250	$40.72	$10,180.00			
	644	6049	IN SM RD SN SUP&AM TYS80(1)SB(U-EXAL)	EA	2	$1,275.00	$2,550.00			
	416	2006	DRILL SHAFT (48 IN)	LF	30	$28.53	$855.90			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	180	$18.01	$3,241.80			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	400	$4.73	$1,892.00			
	650	6038	INS OH SN SUP(35 FT CANT)	EA	1	$22,345.00	$22,345.00			
Striping	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	8	$83.93	$671.44			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	8	$38.56	$308.48			
SUBTOTAL						*	$61,886.10	$7,364.45	$2,300.00	$71,550.54
Engineering and Contingencies 8 %										$5,724.04
Inflation 10%										$7,727.46
TOTAL										$85,002.04

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 1)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$3,454.42	$2,720.00	
	502	2001	MOBILIZATION	LS	1	$1,626.72	$1,626.72			
Signing	636	2003	ALUMINUM SIGNS (TY G)	SF	11	$24.07	$264.77			
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14	$605.62	$8,478.68			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	85	$0.44	$37.40			
	666	6012	REFL PAV MRK TY I (W)4"(SLD)(100MIL)	LF	3400	$0.40	$1,360.00			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	200	$1.28	$256.00			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	400	$2.74	$1,096.00			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	3400	$0.40	$1,360.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	85	$0.12	$10.20			
	666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	3400	$0.09	$306.00			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	200	$0.69	$138.00			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	400	$1.24	$496.00			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	6	$38.56	$231.36			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	3400	$0.09	$306.00			
	666	6224	PAVEMENT SEALER 4"	LF	3450	$0.20	$690.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	3000	$0.20	$600.00			
SUBTOTAL						*	$21,960.71	$3,454.42	$2,720.00	$28,135.13
Engineering and Contingencies 8 %										$2,250.81
Inflation 10%										$3,038.59
TOTAL										$33,424.53

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 2)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$3,496.22	$2,880.00	
	502	2001	MOBILIZATION	LS	1	$1,646.40	$1,646.40			
Signing	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	14	$605.62	$8,478.68			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	90	$0.44	$39.60			
	666	6012	REFL PAV MRK TY I (W)4"(SLD)(100MIL)	LF	3600	$0.40	$1,440.00			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	200	$1.28	$256.00			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	400	$2.74	$1,096.00			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	3600	$0.40	$1,440.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	90	$0.12	$10.80			
	666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	3600	$0.09	$324.00			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	200	$0.69	$138.00			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	400	$1.24	$496.00			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	6	$38.56	$231.36			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	3600	$0.09	$324.00			
	666	6224	PAVEMENT SEALER 4"	LF	3690	$0.20	$738.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	4320	$0.20	$864.00			
SUBTOTAL						*	$22,226.42	$3,496.22	$2,880.00	$28,602.64
Engineering and Contingencies 8 %										$2,288.21
Inflation 10%										$3,089.08
TOTAL										$33,979.93

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 3 OPTION A)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	2	$4,200.00	$8,400.00	$38,380.64	$4,480.00	
	502	2001	MOBILIZATION	LS	1	$18,073.81	$18,073.81			
Signing	416	2006	DRILL SHAFT (48 IN)	LF	60	$28.53	$1,711.80			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	400	$18.01	$7,204.00			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	636	6003	ALUMINUM SIGNS (TY O)	SF	240	$40.72	$9,772.80			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	1200	$4.73	$5,676.00			
	650	6035	INS OH SN SUP(35 FT BAL TEE)	EA	1	$22,733.19	$22,733.19			
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11	$605.62	$6,661.82			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	35	$0.44	$15.40			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	180	$1.28	$230.40			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	400	$2.74	$1,096.00			
	666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	12	$69.44	$833.28			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	5600	$0.40	$2,240.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	35	$0.12	$4.20			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	180	$0.69	$124.20			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	400	$1.24	$496.00			
	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	12	$38.22	$458.64			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	6	$38.56	$231.36			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	2800	$0.09	$252.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	3360	$0.20	$672.00			
K9 LANE SEPARATOR	104	6001	REMOVING CONC (PAV)	SY	1711	$19.81	$33,894.91			
	529	6008	CONC CURB & GUTTER (TY II)	LF	2800	$8.31	$23,268.00			
	531	6003	CONC SIDEWALKS (6")	SY	1711	$32.00	$54,752.00			
			LICENSE PLATE READER	LS	1	$41,263.48	$41,263.48			
SUBTOTAL						*	$243,996.43	$38,380.64	$4,480.00	$286,857.07
Engineering and Contingencies 8 %										$22,948.57
Inflation 10%										$30,980.56
TOTAL										$340,786.20

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 3 OPTION B)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	2	$4,200.00	$8,400.00	$32,216.87	$4,480.00	
	502	2001	MOBILIZATION	LS	1	$15,171.23	$15,171.23			
Signing	416	2006	DRILL SHAFT (48 IN)	LF	60	$28.53	$1,711.80			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	400	$18.01	$7,204.00			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	636	6003	ALUMINUM SIGNS (TY O)	SF	320	$40.72	$13,030.40			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	1200	$4.73	$5,676.00			
	650	6035	INS OH SN SUP(35 FT BAL TEE)	EA	1	$22,733.19	$22,733.19			
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	11	$605.62	$6,661.82			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	70	$0.44	$30.80			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	180	$1.28	$230.40			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	400	$2.74	$1,096.00			
	666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	12	$69.44	$833.28			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	12	$83.93	$1,007.16			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	5600	$0.40	$2,240.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	70	$0.12	$8.40			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	200	$0.69	$138.00			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	400	$1.24	$496.00			
	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	12	$38.22	$458.64			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	12	$38.56	$462.72			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	2800	$0.09	$252.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	3360	$0.20	$672.00			
K9 LANE SEPARATOR	104	6001	REMOVING CONC (PAV)	SY	933	$19.81	$18,482.73			
	529	6008	CONC CURB & GUTTER (TY II)	LF	2800	$8.31	$23,268.00			
	531	6003	CONC SIDEWALKS (6")	SY	933	$32.00	$29,856.00			
			LICENSE PLATE READER	LS	1	$41,263.48	$41,263.48			
SUBTOTAL						*	$204,811.61	$32,216.87	$4,480.00	$241,508.48
Engineering and Contingencies 8 %										$19,320.68
Inflation 10%										$26,082.92
TOTAL										$286,912.07

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 4 OPTION A)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00	$51,690.88	$12,960.00	
	502	2001	MOBILIZATION	LS	1	$24,341.73	$24,341.73			
Signing	416	2006	DRILL SHAFT (48 IN)	LF	60	$28.53	$1,711.80			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	400	$18.01	$7,204.00			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	636	6003	ALUMINUM SIGNS (TY O)	SF	240	$40.72	$9,772.80			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	1200	$4.73	$5,676.00			
	650	6035	INS OH SN SUP(35 FT BAL TEE)	EA	1	$22,733.19	$22,733.19			
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	22	$605.62	$13,323.64			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	68	$0.44	$29.70			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	180	$1.28	$230.40			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	320	$2.74	$876.80			
	666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	24	$69.44	$1,666.56			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	10800	$0.40	$4,320.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	68	$0.12	$8.16			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	180	$0.69	$124.20			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	340	$1.24	$421.60			
	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	24	$38.22	$917.28			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	6	$38.56	$231.36			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	5400	$0.09	$486.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	10800	$0.20	$2,160.00			
K9 LANE SEPARATOR	104	6001	REMOVING CONC (PAV)	SY	3300	$19.81	$65,373.00			
	529	6008	CONC CURB & GUTTER (TY II)	LF	5400	$8.31	$44,874.00			
	531	6003	CONC SIDEWALKS (6")	SY	3300	$32.00	$105,600.00			
SUBTOTAL						*	$328,613.36	$51,690.88	$12,960.00	$393,264.24
Engineering and Contingencies 8 %										$31,461.14
Inflation 10%										$42,472.54
TOTAL										$467,197.92

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 4 OPTION B)										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00	$38,669.11	$12,960.00	
	502	2001	MOBILIZATION	LS	1	$18,209.66	$18,209.66			
Signing	416	2006	DRILL SHAFT (48 IN)	LF	60	$28.53	$1,711.80			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	400	$18.01	$7,204.00			
	540	2005	TERMINAL ANCHOR SECTION	EA	1	$938.67	$938.67			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	$2,488.89	$2,488.89			
	636	6003	ALUMINUM SIGNS (TY O)	SF	320	$40.72	$13,030.40			
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	1200	$4.73	$5,676.00			
	650	6035	INS OH SN SUP(35 FT BAL TEE)	EA	1	$22,733.19	$22,733.19			
	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	22	$605.62	$13,323.64			
Striping	666	6003	REFL PAV MRK TY I (W)4"(BRK)(100MIL)	LF	68	$0.44	$29.92			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	180	$1.28	$230.40			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	340	$2.74	$931.60			
	666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	9	$69.44	$624.96			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6	$83.93	$503.58			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	10800	$0.40	$4,320.00			
	666	6167	REFL PAV MRK TY II (W) 4" (BRK)	LF	68	$0.12	$8.16			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	180	$0.69	$124.20			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	340	$1.24	$421.60			
	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	12	$38.22	$458.64			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	9	$38.56	$347.04			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	5400	$0.09	$486.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	6480	$0.20	$1,296.00			
K9 LANE SEPARATOR	104	6001	REMOVING CONC (PAV)	SY	1800	$19.81	$35,658.00			
	529	6008	CONC CURB & GUTTER (TY II)	LF	5400	$8.31	$44,874.00			
	531	6003	CONC SIDEWALKS (6")	SY	1800	$32.00	$57,600.00			
SUBTOTAL						*	$245,830.35	$38,669.11	$12,960.00	$297,459.46
Engineering and Contingencies 8 %										$23,796.76
Inflation 10%										$32,125.62
TOTAL										$353,381.84

PROJECT 2. SIGNING AND STRIPING TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE ON THE MEXICO SIDE (SEGMENT 5)

	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
General	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$10,447.46	$1,200.00	
	502	2001	MOBILIZATION	LS	1	$915.70	$915.70			
Signing	644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	4	$605.62	$2,422.48			
Striping	666	6012	REFL PAV MRK TY I (W)4"(SLD)(100MIL)	LF	1000	$0.40	$400.00			
	666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	800	$1.28	$1,024.00			
	666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	200	$2.74	$548.00			
	666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	8	$69.44	$555.52			
	666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3	$83.93	$251.79			
	666	6126	REFL PAV MRK TY I (Y)4"(SLD)(100MIL)	LF	1000	$0.40	$400.00			
	666	6170	REFL PAV MRK TY II (W) 4" (SLD)	LF	1000	$0.09	$93.00			
	666	6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	800	$0.69	$552.00			
	666	6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	200	$1.24	$248.00			
	666	6184	REFL PAV MRK TY II (W) (ARROW)	EA	8	$38.22	$305.76			
	666	6192	REFL PAV MRK TY II (W) (WORD)	EA	3	$38.56	$115.68			
	666	6207	REFL PAV MRK TY II (Y) 4" (SLD)	LF	1000	$0.09	$90.00			
	677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1200	$0.20	$240.00			
LANE DELINEATOR			LANE DIVIDER	EA	160	$79.95	$12,792.00			
OTHER			LICENSE PLATE READER	LS	1	$41,263.48	$41,263.48			
SUBTOTAL						*	$66,417.41	$10,447.46	$1,200.00	$78,064.87
Engineering and Contingencies 8 %										$6,245.19
Inflation 10%										$8,431.01
TOTAL										$92,741.06

PROJECT 3. INTELLIGENT TRANSPORTATION SYSTEM DEVICES TO PROVIDE BORDER CROSSING TIMES ON THE U.S. SIDE, INCLUDING DMS, CCTV CAMERAS, AVI AND BLUETOOTH READERS										
	ESTIMATED CONSTRUCTION ITEMS				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
DMS, CCTV CAMERA, Bluetooth	416	2005	DRILL SHAFT (42 IN)	LF	125	$151.46	$18,932.50	$103,892.65	$38,400.00 ASSUMPTIONS: THREE MONTHS OF CONSTRUCTION	
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00			
	502	2001	MOBILIZATION	LS	1	$54,969.66	$54,969.66			
	540	2001	MTL W-BEAM GD FEN (TIM POST)	LF	1000	$18.01	$18,010.00			
	540	2005	TERMINAL ANCHOR SECTION	EA	5	$938.67	$4,693.35			
	544	2001	GUARDRAIL END TREATMENT (INSTALL)	EA	5	$2,488.89	$12,444.45			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	500	$7.01	$3,505.00			
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	1600	$18.80	$30,080.00			
	620	2010	ELEC CONDR (NO. 6) INSULATED (POWER)	LF	5000	$1.49	$7,450.00			
	620	2010	ELEC CONDR (NO. 6) INSULATED (GROUND)	LF	2500	$1.49	$3,725.00			
	624	2008	GROUND BOX TY A (122311) W/APRON	EA	13	$735.03	$9,555.39			
	628	2075	ELC SRV TY D 120/240 060 (NS) SS (E) SP (U)	EA	5	$4,625.00	$23,125.00			
	650	2022	INS OH SN SUP (25 FT CANT)	EA	5	$18,000.00	$90,000.00			
	6920	2001	CCTV FIELD EQUIPMENT	EA	5	$15,000.00	$75,000.00			
	2339	2001	FIELD ETHERNET SWITCH	EA	5	$3,000.00	$15,000.00			
	2343	2001	BLUETOOTH READER	EA	5	$4,200.00	$21,000.00			
			LED DMS FIELD EQUIPMENT	EA	5	$60,000.00	$300,000.00			
			AVI READERS (PASSENGER VEHICLES AND TRUCKS)	EA	14	$3,000.00	$42,000.00			
SUBTOTAL						*	$742,090.35	$103,892.65	$38,400.00	$884,382.99
Engineering and Contingencies 8 %										$70,750.64
Inflation 10%										$95,513.36
TOTAL										$1,050,647.00

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

PROJECT 3A. INTELLIGENT TRANSPORTATION SYSTEM DEVICES TO PROVIDE BORDER CROSSING TIMES ON THE U.S. SIDE, FOUR DMS ON THE BRIDGE										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
DMS ON BRIDGE	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00	$67,105.06	$38,400.00 ASSUMPTIONS: THREE MONTHS OF CONSTRUCTION	
	502	2001	MOBILIZATION	LS	1	$29,153.93	$29,153.93			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	800	$7.01	$5,608.00			
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	230	$18.80	$4,324.00			
	618	6070	CONDT (RM) (2")	LF	900	$58.00	$52,200.00			
	620	2004	ELEC CONDR (NO. 2) INSULATED (POWER)	LF	4000	$2.25	$9,000.00			
	620	2004	ELEC CONDR (NO. 2) INSULATED (GROUND)	LF	2000	$2.21	$4,420.00			
	624	2008	GROUND BOX TY A (122311) W/APRON	EA	3	$735.04	$2,205.12			
	628	2075	ELC SRV TY D 120/240 060 (NS) SS (E) SP (U)	EA	1	$4,625.00	$4,625.00			
	2339	2001	FIELD ETHERNET SWITCH	EA	2	$3,000.00	$6,000.00			
	2343	2001	BLUETOOTH READER	EA	2	$4,200.00	$8,400.00			
			BRIDGE DMS	EA	4	$20,000.00	$80,000.00			
	650	2040	INS OH SN SUP (40 FT CANT)	EA	2	$27,421.00	$54,842.00			
			SUPPORT STRUCTURE BRIDGE	EA	2	$50,000.00	$100,000.00			
			STRUCTURE CABINET	EA	2	$4,100.00	$8,200.00			
			AVI READERS (PASSENGER VEHICLES AND TRUCKS)	EA	4	$3,000.00	$12,000.00			
SUBTOTAL						*	$393,578.05	$67,105.06	$38,400.00	$499,083.11
Engineering and Contingencies 8 %										$39,926.65
Inflation 10%										$53,900.98
TOTAL										$592,910.73

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

PROECT 4: ITS DEVICES INCLUDING DMS, CCTV CAMERAS, BLUETOOTH READERS AND AVI DETECTOR TO BETTER GUIDE TRUCKS INTO THE CORRECT LANE AND PROVIDE BORDER CROSSING TIMES ON THE MEXICO SIDE										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
DMS, CCTV CAMERA, Bluetooth	416	2005	DRILL SHAFT (42 IN)	LF	75	$151.46	$11,359.50	$46,735.14	$38,400.00 ASSUMPTIONS: THREE MONTHS OF CONSTRUCTION	
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00			
	502	2001	MOBILIZATION	LS	1	$24,727.59	$24,727.59			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	500	$7.01	$3,505.00			
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	1000	$18.80	$18,800.00			
	620	2010	ELEC CONDR (NO. 6) INSULATED (POWER)	LF	3000	$1.49	$4,470.00			
	620	2009	ELEC CONDR (NO. 6) BARE (GROUND)	LF	1500	$1.18	$1,770.00			
	624	2008	GROUND BOX TY A (122311) W/APRON	EA	9	$735.04	$6,615.36			
	628	2075	ELC SRV TY D 120/240 060 (NS) SS (E) SP (U)	EA	3	$4,625.00	$13,875.00			
	650		INS OH SN SUP (25 FT CANT)	EA	3	$18,500.00	$55,500.00			
	6920	2001	CCTV FIELD EQUIPMENT	EA	3	$15,000.00	$45,000.00			
	2339	2001	FIELD ETHERNET SWITCH	EA	3	$3,000.00	$9,000.00			
	2343	2001	BLUETOOTH READER	EA	3	$4,200.00	$12,600.00			
			LED DMS FIELD EQUIPMENT	EA	3	$32,000.00	$96,000.00			
			AVI READERS (PASSENGER VEHICLES AND TRUCKS)	EA	6	$3,000.00	$18,000.00			
SUBTOTAL						*	$333,822.45	$46,735.14	$38,400.00	$418,957.59
Engineering and Contingencies 8 %										$33,516.61
Inflation 10%										$45,247.42
TOTAL										$497,721.62

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

PROJECT 5: BORDER CROSSING TRAFFIC CONDITIONS DISSEMINATION ON THE U.S. SIDE										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$29,031.31	$12,800.00 ASSUMPTIONS: ONE MONTH OF CONSTRUCTION	
	502	2001	MOBILIZATION	LS	1	$5,120.16	$5,120.16			
HAR EQUIPMENT			HIGHWAY ADVISORY RADIO STATION	EA	1	$10,000.00	$10,000.00			
			HIGHWAY ADVISORY RADIO SERVER/SOFTWARE	EA	1	$5,000.00	$5,000.00			
	636	2003	ALUMINUM SIGNS (TY G)	SF	400	$24.07	$9,628.00			
HAR SIGN	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	500	$4.76	$2,380.00			
	416	2001	DRILL SHAFT (18 IN)	LF	100	$77.94	$7,794.00			
SOFTWARE			SOFTWARE DEVELOPMENT (WEBPAGE/TEXT SMS)	LS	1	$25,000.00	$25,000.00			
SUBTOTAL						*	$69,122.16	$29,031.31	$12,800.00	$110,953.47
Engineering and Contingencies 8 %										$8,876.28
Inflation 10%										$11,982.97
TOTAL										$131,812.72

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

PROJECT 5A: BORDER CROSSING TRAFFIC CONDITIONS DISSEMINATION ON THE MEXICO SIDE										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$1,209.04	$1,209.04	$7,478.76	$12,800.00	
HAR SIGN	636	2003	ALUMINUM SIGNS (TY G)	SF	180	$24.07	$4,332.60		ASSUMPTIONS:	
	647	2001	INSTALL LRSS (STRUCT STEEL)	LB	400	$4.76	$1,904.00		ONE MONTH OF CONSTRUCTION	
	416	2001	DRILL SHAFT (18 IN)	LF	60	$77.94	$4,676.40			
SUBTOTAL						*	$16,322.04	$7,478.76	$12,800.00	$36,600.80
Engineering and Contingencies 8 %										$2,928.06
Inflation 10%										$3,952.89
TOTAL										$43,481.75

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

PROJECT 6: ELECTRONIC TOLL COLLECTION SYSTEM										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	6	$4,200.00	$25,200.00			
	502	2001	MOBILIZATION	LS	1	$96,753.70	$96,753.70			
			AVI READERS (PASSENGER VEHICLES AND TRUCKS)	EA	12	$3,000.00	$36,000.00			
			NFC READERS (PEDESTRIANS, PASSENGER VEHICLES AND TRUCKS)	EA	22	$500.00	$11,000.00	$280,111.49	$76,800.00	
			HANDHELD TRANSPONDER READER (PEDESTRIANS)	EA	10	$500.00	$5,000.00			
			AUTOMATIC TRAFFIC GATE (PASSENGER VEHICLES AND TRUCKS)	EA	12	$3,500.00	$42,000.00		ASSUMPTIONS: SIX MONTHS OF CONSTRUCTION	
			CCTV CAMERAS SECURITY SYSTEM	EA	3	$12,500.00	$37,500.00			
			PEDESTRIAN TOLL BOOTHS (PEDESTRIAN)	EA	10	$7,000.00	$70,000.00			
			TOLL BOOTH ART DESIGN	LS	1	$15,000.00	$15,000.00			
			CASH COLLECTOR SYSTEM (PASSENGER VEHCILES AND TRUCKS)	EA	13	$1,150.00	$14,950.00			
			TRANSPONDER VENDING MACHINE	EA	3	$12,500.00	$37,500.00			
	2339	2001	FIELD ETHERNET SWITCH (1 GB)	EA	26	$3,000.00	$78,000.00			
			ORACLE SERVER	EA	4	$5,000.00	$20,000.00			
			BACKOFFICE SERVER	EA	1	$5,000.00	$5,000.00			
			SOFTWARE DEVELOPMENT	LS	1	$250,000.00	$250,000.00			
			FIVE PERSON TECHNICAL STAFF (5 YEAR)	HR	52000	$140.00	$7,280,000.00			
			SOFTWARE PROGRAMMER VISIT (ONCE QUARTERLY)	EA	20	$1,850.00	$37,000.00			
			TRAINING	LS	1	$10,000.00	$10,000.00			
			MAINTENANCE PICK UP TRUCKS	EA	3	$30,000.00	$90,000.00			
			BACKOFFICE ROOM CONSTRUCTION	LS	1	$750,000.00	$750,000.00			
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	2361	$18.80	$44,386.80			
	8490	2001	ETHERNET CABLE	FT	3874	$1.20	$4,648.80			
	624	2008	GROUND BOX TY A (122311) W/APRON	EA	18	$735.04	$13,230.72			
	110	2003	EXCAVATION (SPECIAL)	CY	1.40	$3.50	$4.90			
SUBTOTAL							$8,973,174.92	$280,111.49	$76,800.00	$9,330,086.40
Engineering and Contingencies 8 %										$746,406.91
Inflation 10%										$1,007,649.33
TOTAL										$11,084,142.65

COMMUNICATION NETWORK - ESTIMATED FIBER OPTIC CABLE INFRASTRUCTURE COST ON US SIDE FOR PROJECT 3										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	110	2003	EXCAVATION (SPECIAL)	CY	1.10	$3.50	$3.85			
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00			
	502	2001	MOBILIZATION	LS	1	$26,645.19	$26,645.19			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	5400	$7.01	$37,854.00	$50,359.41	$38,400.00	
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	2800	$18.80	$52,640.00		ASSUMPTIONS:	
	620	2018	ELEC CONDR (NO. 14) INSULATED	LF	8300	$1.50	$12,450.00		THREE MONTHS OF	
	624	2002	GROUND BOX TY 1 (122422) W/APRON	EA	6	$1,650.00	$9,900.00		CONSTRUCTION	
	624	2004	GROUND BOX TY 2 (243636) W/APRON	EA	4	$1,700.00	$6,800.00			
	6007	6020	FIBER OPTIC PIGTAIL (12 FIBER)	LF	9100	$20.32	$184,912.00			
	6014	2021	FIBER OPTIC PATCH PANEL (12 POSITION)	EA	5	$301.00	$1,505.00			
	6014	2033	FIBER OPTIC SPLICE ENCLOSURE	EA	3	$3,600.00	$10,800.00			
	6007	6026	FIBER OPTIC CABLE ROAD MARKER	EA	9	$400.00	$3,600.00			
SUBTOTAL						*	$359,710.04	$50,359.41	$38,400.00	$448,469.44
Engineering and Contingencies 8 %										$35,877.56
Inflation 10%										$48,434.70
TOTAL										$532,781.70

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED FIBER OPTIC CABLE INFRASTRUCTURE COST ON US SIDE FOR PROJECT 3A - BRIDGE DMS										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	110	2003	EXCAVATION (SPECIAL)	CY	1.10	$3.50	$3.85			
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00			
	502	2001	MOBILIZATION	LS	1	$11,563.71	$11,563.71			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	1150	$7.01	$8,061.50	$21,855.41	$38,400.00	
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	600	$18.80	$11,280.00		ASSUMPTIONS:	
	618	2052	CONDT (RM) (2")	LF	900	$20.54	$18,486.00		THREE MONTHS OF	
	620	2018	ELEC CONDR (NO. 14) INSULATED	LF	2650	$1.50	$3,975.00		CONSTRUCTION	
	624	2002	GROUND BOX TY 1 (122422) W/APRON	EA	4	$1,650.00	$6,600.00			
	6007	6011	FIBER OPTIC CBL (SNGLE-MODE) (12 FIBER)	LF	3880	$17.20	$66,736.00			
	6014	2021	FIBER OPTIC PATCH PANEL (12 POSITION)	EA	4	$301.00	$1,204.00			
	6014	2033	FIBER OPTIC SPLICE ENCLOSURE	EA	4	$3,600.00	$14,400.00			
	6014	2037	FIBER OPTIC CABLE ROAD MARKER	EA	3	$400.00	$1,200.00			
SUBTOTAL						*	$156,110.06	$21,855.41	$38,400.00	$216,365.47
Engineering and Contingencies 8 %										$17,309.24
Inflation 10%										$23,367.47
TOTAL										$257,042.17

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED WIRELESS CONNECTION COST ON US SIDE FOR PROJECT 3										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	416	2004	DRILL SHAFT (36 IN)	LF	50	$170.00	$8,500.00			
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$6,046.40	$6,046.40			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	10	$8.00	$80.00	$11,427.70	$12,800.00	
	8490	2001	ETHERNET CABLE CAT 5	LF	300	$1.00	$300.00		ASSUMPTIONS:	
	8446	2003	CAMERA POLE STRUCTURE W/ CABINET (55 FT)	EA	2	$15,000.00	$30,000.00		ONE MONTH OF CONSTRUCTION	
	2340	2002	5 GHZ ETHERNET RADIO (STAND ALONE)	EA	2	$3,000.00	$6,000.00			
	2340	2003	5 GHZ 60 DEGREE SECTOR ANTENNA	EA	2	$5,000.00	$10,000.00			
	2340	2001	5 GHZ ETHERNET RADIO	EA	5	$3,300.00	$16,500.00			
SUBTOTAL						*	$81,626.40	$11,427.70	$12,800.00	$105,854.10
Engineering and Contingencies 8 %										$8,468.33
Inflation 10%										$11,432.24
TOTAL										$125,754.67

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED WIRELESS CONNECTION COST ON US SIDE FOR PROJECT 3A - BRIDGE DMS										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$2,039.20	$2,039.20	$3,854.09	$12,800.00	
	8490	2001	ETHERNET CABLE CAT 5	LF	90	$1.00	$90.00		ASSUMPTIONS:	
	2340	2002	5 GHZ ETHERNET RADIO (STAND ALONE)	EA	1	$3,000.00	$3,000.00		ONE MONTH OF CONSTRUCTION	
	2340	2003	5 GHZ 60 DEGREE SECTOR ANTENNA	EA	1	$5,000.00	$5,000.00			
	2340	2001	5 GHZ ETHERNET RADIO	EA	4	$3,300.00	$13,200.00			
SUBTOTAL						*	$27,529.20	$3,854.09	$12,800.00	$44,183.29
Engineering and Contingencies 8 %										$3,534.66
Inflation 10%										$4,771.80
TOTAL										$52,489.75

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED CELLULAR CONNECTION COST ON US SIDE FOR PROJECT 3										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$3,056.00	$3,056.00	$2,000.00	$500.00	
			CELLULAR MODEM (4G) 5 YEARS SERVICE	EA	5	$6,800.00	$34,000.00		ASSUMPTIONS:	
			UNIT PRICE COST INCLUDES A 5 YEAR OF MONTHLY SERVICE FEES						ONE MONTH OF CONSTRUCTION	
SUBTOTAL						*	$41,256.00	$2,000.00	$500.00	$43,756.00
Engineering and Contingencies 8 %										$3,500.48
Inflation 10%										$4,725.65
TOTAL										$51,982.13

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED CELLULAR CONNECTION COST ON US SIDE FOR PROJECT 3A - BRIDGE DMS										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$1,424.00	$1,424.00	$2,000.00	$500.00	
			CELLULAR MODEM (4G)	EA	2	$6,800.00	$13,600.00		ASSUMPTIONS:	
			UNIT PRICE COST INCLUDEDS A 5 YEAR OF MONTLY SERVICE FEES						ONE MONTH OF CONSTRUCTION	
SUBTOTAL						*	$19,224.00	$2,000.00	$500.00	$21,724.00
Engineering and Contingencies 8 %										$1,737.92
Inflation 10%										$2,346.19
TOTAL										$25,808.11

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED FIBER OPTIC CABLE INFRASTRUCTURE COST ON MEXICO SIDE FOR PROJECT 4										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	110	2003	EXCAVATION (SPECIAL)	CY	1.10	$3.50	$3.85			
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	3	$4,200.00	$12,600.00			
	502	2001	MOBILIZATION	LS	1	$35,832.47	$35,832.47			
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	3900	$7.01	$27,339.00	$67,723.36	$38,400.00	
	618	2019	CONDT (PVC) (SCHD 40) (2") (BORE)	LF	10200	$18.80	$191,760.00		ASSUMPTIONS:	
	620	2018	ELEC CONDR (NO. 14) INSULATED	LF	14100	$1.50	$21,150.00		THREE MONTHS OF	
	624	2002	GROUND BOX TY 1 (122422) W/APRON	EA	14	$1,650.00	$23,100.00		CONSTRUCTION	
	6007	6013	FIBER OPTIC CBL (SNGLE-MODE) (12 FIBER)	LF	8100	$17.20	$139,320.00			
	6007	6013	FIBER OPTIC CBL (SNGLE-MODE) (36 FIBER)	LF	8600	$2.05	$17,630.00			
	6007	6022	FIBER OPTIC PATCH PANEL (36 POSITION)	EA	1	$5,500.00	$5,500.00			
	6014	2021	FIBER OPTIC PATCH PANEL (12 POSITION)	EA	3	$301.00	$903.00			
	6014	2033	FIBER OPTIC SPLICE ENCLOSURE	EA	1	$3,600.00	$3,600.00			
	6014	2037	FIBER OPTIC CABLE ROAD MARKER	EA	5	$400.00	$2,000.00			
	2339	2001	FIELD ETHERNET SWITCH	EA	1	$3,000.00	$3,000.00			
SUBTOTAL						*	$483,738.32	$67,723.36	$38,400.00	$589,861.68
Engineering and Contingencies 8 %										$47,188.93
Inflation 10%										$63,705.06
TOTAL										$700,755.68

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED WIRELESS CONNECTION COST ON MEXICO SIDE FOR PROJECT 4										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	416	2004	DRILL SHAFT (36 IN)	LF	20	$170.00	$3,400.00			
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00	$6,837.26	$12,800.00	
	502	2001	MOBILIZATION	LS	1	$3,617.60	$3,617.60		ASSUMPTIONS:	
	618	2018	CONDT (PVC) (SCHD 40) (2")	LF	300	$8.00	$2,400.00		ONE MONTH OF CONSTRUCTION	
	8490	2001	ETHERNET CABLE CAT 5	LF	320	$1.00	$320.00			
	6087	6002	CAMERA POLE STRUCTURE W/ CABINET (60 FT)	EA	1	$15,000.00	$15,000.00			
	2340	2002	5 GHZ ETHERNET RADIO (STAND ALONE)	EA	1	$3,000.00	$3,000.00			
	2340	2003	5 GHZ 60 DEGREE SECTOR ANTENNA	EA	1	$5,000.00	$5,000.00			
	2339	2001	FIELD ETHERNET SWITCH	EA	1	$2,000.00	$2,000.00			
	2340	2001	5 GHZ ETHERNET RADIO	EA	3	$3,300.00	$9,900.00			
SUBTOTAL						*	$48,837.60	$6,837.26	$12,800.00	$68,474.86
Engineering and Contingencies 8 %										$5,477.99
Inflation 10%										$7,395.29
TOTAL										$81,348.14

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

COMMUNICATION NETWORK - ESTIMATED CELLULAR CONNECTION COST ON MEXICO SIDE FOR PROJECT 4										
	ESTIMATED CONSTRUCTION ITEMS AND COST				QTY	UNIT PRICE	SUBTOTAL	ESTIMATED ENGINEERING FEE	ESTIMATED CONSTRUCTION INSPECTION COST	TOTAL
	500	2001	BARRICADES, SIGN AND TRAFFIC CONTROL	MO	1	$4,200.00	$4,200.00			
	502	2001	MOBILIZATION	LS	1	$1,968.00	$1,968.00	$2,000.00	$500.00	
			CELLULAR MODEM (4G) 5 YEAR SERVICE	EA	3	$6,800.00	$20,400.00		ASSUMPTIONS:	
	UNIT PRICE COST INCLUDES A 5 YEAR OF MONTHLY SERVICE FEES								ONE MONTH OF CONSTRUCTION	
SUBTOTAL						*	$26,568.00	$2,000.00	$500.00	$29,068.00
Engineering and Contingencies 8 %										$2,325.44
Inflation 10%										$3,139.34
TOTAL										$34,532.78

* ESTIMATED CONSTRUCTION COST ITEMS ARE BASED ON 2015 TXDOT AVERAGE BID PRICES

A.2 SIGNING AND STRIPING

Table 12: Striping

Striping						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	S Americas Ave.	NB		2000 ft.		
2	S Americas Ave.	SB		3000 ft.		
3	Zaragoza Inspection Facility Rd.	SB	1000 ft.			
4	POE to U.S. Bridge	NB	2200 ft.			
5	Winn Rd.	WB	8000 ft.			
6	Av. Manuel J Clouthier	NB			1200ft	7100ft
7	POE To U.S. Bridge (Truck Lane Separator)	NB	2200ft			
8	Av. Manuel J Clouthier (Truck Lane Separator)	NB				3000ft

Proposed Striping

Total 245,00 ft.

Proposed Lane Separator

Total 5200 ft.

Table 13: Signs

Signs						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	NB		1		
2	Loop 375	SB		1		
3	Pan American Dr.	NB	1			
4	Pan American Dr.	SB	1			
5	S Americas Ave.	NB		1		
6	S Americas Ave.	NB		1		
7	S Americas Ave.	SB		1		
8	Winn Rd.	WB	1			
9	Rio Del Norte Dr.	NB	1			
10	Zaragoza Inspection Facility Rd.	SB	1			
11	Av. Manuel J Clouthier	NB				1
12	Av. Manuel J Clouthier	NB				1
13	Av. Manuel J Clouthier	NB				1
14	Boulevard Independencia	NB				1
15	Boulevard Independencia	SB				1
					Proposed Signs	
					Total	**15**

Table 14: DMS

DMS						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	SB		1		
2	Loop 375	NB		1		
3	Pan American Dr.	SB	1			
4	Pan American Dr.	NB	1			
5	Winn Rd.	WB	1			
6	Boulevard Independencia	NB				1
7	Boulevard Independencia	SB				1
8	Av. Manual J Clouthier	NB				1
					Proposed DMS	
					Total	**8**

Table 15: Bridge DMS

Bridge DMS						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Truck Bridge FAST Lane	NB	1			
2	Truck Bridge Regular Lane	NB	1			
3	Truck Bridge FAST Lane	NB	1			
4	Truck Bridge Regular Lane	NB	1			
					Proposed Bridge DMS	
					Total	**4**

Table 16: Bluetooth

Bluetooth						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	SB		1		
2	Loop 375	NB		1		
3	Pan American Dr.	SB	1			
4	Pan American Dr.	NB	1			
5	Winn Rd.	WB	1			
6	Truck Bridge FAST Lane	NB	1			
7	Truck Bridge Regular Lane	NB	1			
8	Boulevard Independencia	NB				1
9	Boulevard Independencia	SB				1
10	Av. Manual J Clouthier	NB				1
				Proposed Bluetooth		
				Total		**10**

Table 17: CCTV Cameras

CCTV Cameras						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	SB		1		
2	Loop 375	NB		1		
3	Pan American Dr.	SB	1			
4	Pan American Dr.	NB	1			
5	Winn Rd.	WB	1			
6	Boulevard Independencia	NB				1
7	Boulevard Independencia	SB				1
8	Av. Manuel J Clouthier	NB				1
				Proposed CCTV Cameras		
				Total		**8**

Table 18: AVI Readers

AVI Reader						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	SB		1		
2	Loop 375	NB		1		
3	Pan American Dr.	SB	1			
4	Pan American Dr.	NB	1			
5	Winn Rd.	WB	1			
6	Truck Bridge FAST Lane	NB	1			
7	Truck Bridge Regular Lane	NB	1			
8	Boulevard Independencia	NB				1
9	Boulevard Independencia	SB				1
10	Av. Manuel J Clouthier	NB				1
				Proposed AVI Readers		
					Total	**10**

Table 19: HAR Tower

HAR Tower						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	POE U.S. Side		1			

Proposed HAR Tower **1**

Table 20: HAR Signs

HAR Signs						
Item	Location	Direction	City of El Paso ROW	TxDOT ROW	Aduanas	Ciudad Juarez
1	Loop 375	SB		1		
2	Loop 375	NB		1		
3	Pan American Dr.	SB	1			
4	Pan American Dr.	NB	1			
5	Winn Rd.	WB	1			
6	Boulevard Independencia	NB				1
7	Boulevard Independencia	SB				1
8	Av. Manuel J Clouthier	NB				1

Proposed HAR Signs

Total **8**

Table 21: Toll Booth Collection

Toll Booth Collection		
Item	Location	City of El Paso ROW
Pedestrian Toll Booth		
1	Santa Fe Bridge	4
2	Stanton Bridge	5
3	Ysleta-Zaragoza Bridge	1
Vehicle Toll Booth		
4	Stanton Bridge	4
5	Ysleta-Zaragoza Bridge	7
Truck Toll Booth		
6	Ysleta-Zaragoza Bridge	1

Proposed Toll Booths	
Pedestrians Total	**10**
Vehicles Total	**11**
Trucks Total	**1**