4.3.1 Conceptual Development Plan

4.3.1.1 Socio-economics and Demographics

A. The role of Texas in global markets

Key Parameters/Assumptions: *Texas has become an economic leader in today's global marketplace. Employment and export data reveal that Texas has been able to leverage its transportation infrastructure and proximity to Latin America to rapidly expand its level of international trade.* ***Implications:*** *The ability to quickly and inexpensively move products will be critical to the state's future economic success. The TTC-35 High Priority Trans-Texas Corridor Project can play an important role in ensuring access to these markets.*

Texas' role in the global marketplace will only grow over time, as the economy continues to move toward higher value-added production and services. The transformation of Texas from a center of commodity production to a place that emphasizes adding value through the application of knowledge and technology is virtually complete. Until recently, the structure of the Texas economy was similar in many ways to that of a developing nation – the state sold basic products such as food and energy, and tended to purchase more sophisticated manufactured goods. That trend as been turned upside down in recent years, as Texas has become a center of research and advanced technology manufacturing.

In the process, Texas' economic linkages with the rest of the world have grown stronger, both in terms of integrated production on the Texas-Mexico border and through international trade. For example, most estimates suggest that about 80 percent of NAFTA-related traffic flows through the state. Texas exports during 2003 totaled more than $98.8 billion, the highest level in the U.S. The state's top value-added exports are computer and electronic products, chemicals, industrial machinery, and transportation equipment. Texas' largest export markets continue to be its NAFTA trading partners, Mexico and Canada, accounting for approximately 55 percent of the total last year. These trends are expected to continue for the foreseeable future. The need for highly efficient movement of goods and people is consistent with the nature and scope of Texas' role in the modern economy.

As Texas continues to build its export base with non-NAFTA countries such as China, the ability to send and receive goods will be a critical factor in expanding trade and generating new business opportunities.

B. Demographics

Key Parameters/Assumptions: *Continued rapid population growth relative to the nation as a whole will creates potential opportunity, but requires continued investment in key infrastructure and education.* ***Implications:*** *By providing required infrastructure, TTC-35 can help Texas reach its economic potential.*

Rapid population growth relative to the rest of the nation will characterize Texas over the next 30 years. By 2010, Texas' population is expected to surpass 24.3 million residents, a five-year growth rate of nearly 8 percent. Fifteen years later (2025) Texas will be home to more than 29.9 million residents – an increase of 33 percent. In the meantime, the population is expected to age, as the current 1 in 10 Texans over the age of 64 will climb to 16.4 percent by 2035. Despite the absolute aging of the population, Texas will become younger than the nation as a whole, as the U.S. population is expected to age even more rapidly.

Three main factors influencing Texas' demographics landscape over the coming decades are population growth, increased diversity, and a larger percentage of retirement eligible residents; each creating new challenges for the pubic sector. Strong overall population growth regardless of ethnicity or gender will place greater strain on an already overstressed road and highway network. Existing and projected demand has already created renewed interest in exploring transit-oriented developments in the state's major metropolises. Recent trends in employment patterns of retirement eligible Americans also reveal a desire of this to keep working past the age of 65. If this trend holds, more and more residents will be making the morning commute to work each day.

Collectively, these three forces will require Texas to upgrade and expand its existing infrastructure. Strong population growth along the Texas-Mexico border has lead to new economic progress. It has also created the need to upgrade the Rio Grande Valley's road infrastructure on both sides of the border. The state's largest cities such as Austin, Dallas, Houston, and San Antonio are projected to continue to attract a large number of new residents (both from inside and outside of the state). In an attempt to retain workers and reduce stress from lengthy commutes, many employers in large cities are starting to offer employees the option of telecommuting. For this to succeed, both employer and employee need access to high bandwidth telecommunications services. Improving network linkages will not solve all of the challenges created by Texas' demographic transformation, but it will help address the most critical issues.

C. Trends in the growth and strength of federal and state fiscal position and budget

Key Parameters/Assumptions: *The role of the public sector in funding basic infrastructure is changing, with a greater emphasis on user fees, public-private partnerships, and alternative financing mechanisms.* ***Implications:*** *A variety of financing mechanisms will be needed to fully implement TTC-35.*

Public sector funding of basic infrastructure, including the transportation network, has been declining for some time, as the State of Texas spends proportionately less today on highways than it did 20 years ago. For example, the Comptroller's Office reports that Highway Maintenance & Construction as a line item accounted for 11.2 percent of State expenditures during fiscal 1983; by fiscal 2003, Transportation (the new category which includes Highway Maintenance & Construction) had fallen to 8.2 percent. As a result, the focus has shifted toward alternatives to traditional general obligation debt financing of basic infrastructure, with a greater emphasis on tolls, tax-increment financing, development fees, and other alternative financing structures. The implication for the TTC-35 is obvious, as a variety of financing mechanisms and sources likely will be employed.

D. Social and urbanization trends

Key Parameters/Assumptions: *A fundamental shift is taking place in real estate development and urban planning. Transit-oriented developments focusing on pedestrian-oriented design and mixed land use will grow increasingly common over the next twenty years. How these communities are linked via mass transit and automobile routes will influence whether or not communities can contain urban sprawl.* ***Implications:*** *The TTC-35 Project may be able to enhance and encourage this type of development by enabling people to easily move between these urban villages.*

The physical character of Texas communities continues to evolve. The traditional model of community development is changing. Urban areas in Texas have long been characterized by relatively low density, as abundant land fostered spread-out cities that relied almost exclusively on the automobile. In recent years, the rate of population and traffic growth has out-stripped the road system in many areas, leading to increased congestion. This has consequences, as a recent study by the Texas Transportation Institute showed that Texans in major metropolitan areas wasted $6.3 billion during 2001 because of traffic congestion.

Partially as a result, many communities are now focusing on Urbanist design. Known by a variety of names, the defining characteristics of Urbanist projects are walkability or pedestrian-oriented design, connection to transit, a mix of land uses that integrate housing, shops, civic facilities, and work places, and preservation and respect for the natural environment in the form of maintaining or creating green space. The economic and fiscal benefits of Urbanism are summarized as follows:

- Urbanist developments tend to enhance quality of life, which is crucial to both recruitment and retention of companies;
- Mixed-use developments promote greater land-use integration and density, which can facilitate integration with transportation systems and other infrastructure;
- Urbanist developments normally have a longer "shelf-life" than traditional developments, which will tend to create a greater fiscal impact over the medium and longer-term. A portion of this impact is due to the inclusion of housing in the project, both through direct enhancement of the tax base and the indirect effects of relocating consumers to the central city.

In keeping with an Urbanist goal of reducing automobile density, a number of developments in major metropolitan areas across the state are incorporating new types of transit, such as light rail. The ability to link these new regional transportation systems together would increase their usage beyond each area's local need, and would consequently improve traffic congestion throughout Texas.

The net effect of the above is likely to be the development of new communities that are fundamentally different than the traditional suburban model. The mixed-use, transit-oriented nature of many new developments will make proximity to the Trans-Texas Corridor attractive.

E. Economic development impacts related to (i) localized impacts to Facility implementation and (ii) existing urbanized areas in the Corridor.

Key Parameters/Assumptions: *Texas economic development officials at all levels of government spend millions of dollars each year recruiting and retaining businesses. Rural communities must overcome obstacles such as physical distance to major metropolitan markets while large cities grapple with traffic congestion.*
Implications: *TTC-35 is a unique project that can encourage economic development in all areas of the state by updating and enhancing basic infrastructure.*

The economic development impacts are implicit in the trends discussed above, as the opportunity and need for Texas to leverage the continued upgrade of its network infrastructure is crucial to the future success of the State's economy. In general, these effects fall into two broad categories: 1) more efficient movement of people and products, which has positive effects on costs, and 2) the improved "asset base" can help contribute to the attraction of companies and people, further enhancing economic development.

Transportation networks (i.e., interstate highways) have played an important role in the nation's physical growth and development. As American preferences shifted from mass transit to automobiles, communities located along these arteries were able to attract new businesses and residents. It is no coincidence that Texas' largest communities are located along two interstates – I-35 and I-10. While mass transit and high-density developments are being pursued in major metro areas, the state will still require improvements in traditional roads and highways. Historically, new transportation projects created new economic development opportunities as more areas of the state became available for settlement. This trend still holds true today. The TTC-35 Project is designed to address these needs.

Two specific examples highlight the importance of this project for future economic development growth in urban and rural areas – access to state-of-the art telecommunications infrastructure and reliable energy.

The Internet and digital data exchange will continue to reshape business activities. Technology and Texas became synonymous during the 1990s. A number of trends emerged that encouraged the creation of technology-based businesses including significant federal defense-related contracts, R&D expenditures at universities, and existing industries. In 2002, approximately 480,000 Texans were working in the high-tech industry, with telecommunications services representing the largest sector with over 111,000 employees. Even with the recent high-tech slowdown, technology will continue to be an important driver of the Texas economy. In 2001, Texas ranked second nationally for a number of key technology indicators, including number of businesses, payroll, and exports. Additionally, in 2000, Texas performed $11.5 billion in technology R&D. Lastly, the average high-tech wage in Texas was $67,733 - 84 percent higher than the average private sector wage of $36,794.

Many Texas businesses leveraged the opportunities provided by high-speed telecommunications networks and the Internet to build sustainable businesses. Beyond the high-tech and telecommunications sectors, non-technology businesses relied heavily on this infrastructure to communicate internally and externally. Access to state-of-the-art telecommunications infrastructure will continue to be a significant factor in Texas' future economic growth. The ability to link regions (including rural and urban regions within Texas) via secure voice and data networks will offer limitless business opportunities. Since most businesses operate in a global marketplace, it is critical to provide reliable and cost-effective networks that link partners and suppliers. Some of the hottest trends in technology are based on redefining how we communicate and share information, including telephone calls over the Internet, streaming media, and content on demand.

Texas is becoming increasingly linked to the competitive global economy. It is crucial that businesses are able to share information and ideas with customers and suppliers throughout the world. The telecommunications sector is also a fast-growing industry that can take advantage of the existing supply of skilled-labor.

Texas is growing increasingly reliant on imported energy. Rising natural gas and oil prices have raised concerns that increasing energy costs could dampen the current economy recovery. Higher energy prices put downward pressure on profits for oil refiners, chemical manufacturers, transportation companies, and energy-intensive manufacturers. This is especially troubling since these are the types of businesses already struggling to adjust to increasing foreign competition. While the United States economy has learned from past energy crises and is better able to respond to increasing costs, above average energy costs could hamper economic growth. Texas could be disproportionately affected given its large energy and refining sectors. Some sectors such as oil and gas producers will benefit, while petroleum refiners and chemical manufacturers will have to adjust to rising input costs. Once promoted as a cost-effective energy source, natural gas is no longer a cheap alternative fuel. Increasing demand, rising exploration and production costs, and limited access to new fields will continue to place upward pressure on natural gas prices. A number of options exist to counterbalance this trend including the importation of liquefied natural gas from foreign sources and increased production in Alaska. Other issues such as new transmission pipelines and improved electricity grids will also need to be examined.

The importation of liquefied natural gas is one solution to counter growing demand with shrinking local supply. In fact, many of the largest economic development projects along the Gulf of Mexico are proposed liquefied natural gas terminals. A challenge still facing these projects is the ability to have a cost-effective transmission pipeline system available for distribution. In addition, the electricity outages that have plagued many parts of the country in recent years serve as a reminder of the need to continually upgrade all energy distribution networks.

Both of these issues, access to modern telecommunications and reliable energy, are critical components of the state's long-term economic vitality. The Corridor project is an important development that will address these important issues.

4.3.1.2 Anticipated Impacts of the CDP

Key Parameters/Assumptions: *Issues such a strong population growth, greater reliance on international trade, increased traffic congestion, and unimaginable business opportunities created by information exchange via the Internet all require new strategies to update and enhance Texas' infrastructure network.* ***Implications:*** *A thorough understanding of these issues will enable the Trans-Texas Corridor project to mitigate adverse impacts while promoting long-term sustainable growth.*

Much of the modern economy's development can be traced to the implementation of networks – highways, rail, telecommunications, and energy. The ability to efficiently move goods, people, capital, energy, and ideas continues to transform the way humans live, work, and play. The Trans-Texas Corridor holds the promise of significantly enhancing the network system of Texas, and could, in the process, make a measurable contribution to local economic growth and development.

First and foremost, TTC-35 is an upgrade to Texas' transportation capacity. Throughout history, transportation was the first network system to be comprehensively deployed, with improvements in the movement of goods and people preceding every stage of industrial development. As outlined by Dr. John Kasarda of University of North Carolina, transportation was a critical ingredient in the four major waves of industrialization that have occurred to date:

- The first great cities developed around seaports and along trade routes.
- The second wave of development — and the beginning of the Industrial Revolution — occurred when factories used canals and rivers for power and shipping.
- The third wave of industrial development started with the railroad system, which opened up landlocked resources.

- The fourth wave of development began with massive investments in highway infrastructure that increased traffic, expanded personal mobility, and accelerated metropolitan growth.

At the opening of the 21st century, the United States is in a fifth wave of industrialization that is transforming the global market and changing traditional notions of development. According to the Federal Highway Administration (FHWA), this wave is based on innovations in logistics and manufacturing. Increasingly, components are manufactured offshore, and then they are assembled into finished products near the point of their final consumption or use. This business model depends strongly on a fast and reliable transportation network that minimizes the cost of production. A recent report by a leading logistics company notes that nearly 80 percent of executives consider product delivery as important as product quality. Just as highway infrastructure made the fourth wave possible in the United States, the country's success during the fifth wave will depend on a seamless, intermodal transportation system.

Last year, FHWA released a report that showed how highway improvements dramatically lower production costs in 35 sectors of the economy. They found that a $1 increase in highway capital historically generates about 30 cents of savings per year over the lifetime of the road improvement. The transportation and warehousing sectors were among the sectors with the largest cost savings.

While transportation is the main focus of the Trans-Texas Corridor, the opportunity to coordinate the enhancement of the infrastructure of other networked products, including pipelines, power lines, and telecommunications capacity, offers additional potential benefits. Perhaps the most fundamental advantage is cost-related – acquiring right-of-way and ultimately implementing the infrastructure in areas that presently are relatively rural will be far less expensive in the long run than a more piecemeal approach. Cost savings can also occur in the actual implementation, as pipelines, telecommunications capacity, and the electricity grid can occupy a smaller, less-expensive footprint when implemented on a coordinated basis.

In the near term, the infrastructure associated with TTC-35 could serve to more efficiently connect existing markets, in the process relieving the levels of congestion, delay, and associated cost of the current system. Over time, new development likely will occur in close proximity to the Corridor – per the discussion above, to the extent that the Corridor infrastructure capacity is perceived to be an attractive asset, it may well foster economic development.

4.3.1.3 Coordinating with TxDOT Among Public and Private Entities

As defined by the Request For Detailed Proposals, the role of the Team will be to identify the near-, mid-, and long-term facilities that are financially viable and maximize the movement of people and goods. To that end, the Team sees itself as taking the lead in all aspects of the development of the Project with TxDOT as an active partner in the process.

The key to advancing the Project and the individual facilities is based on the simple philosophy of early and continuous involvement of those entities affected by the Project. The first step in accomplishing this is to identify the key stakeholders. These stakeholders are grouped as follows. The Team considers TxDOT a team member and is not listed in any of the groups below.

- Federal Regulatory: EPA, FHWA, FRA, FTA and FEMA.
- State Regulatory: TCEQ, PUC of Texas. RRC of Texas, and ERCOT.
- Planning Organizations: MPOs and COG.
- Local Governments: cities and counties.
- Tolling authorities: HCTRA and NTTA.
- Private: utilities, railroads and power companies (LCRA).

Within these groups, the stakeholders will be further categorized according to the role each will have in the process. Some, such as the Regional Mobility Authorities, MPOs and FHWA, will have an active role in each step of project development. However, others, such as permitting entities, will have a less active role.

Each entity will be informed of the development of the Trans-Texas Corridor. Although there has been a great deal of attention drawn to the TTC through public meetings and press releases, all will be contacted initially to make sure that they are aware of the Project and to determine the appropriate key contact and decision-maker. This will be done through written communications with response cards and follow up telephone calls.

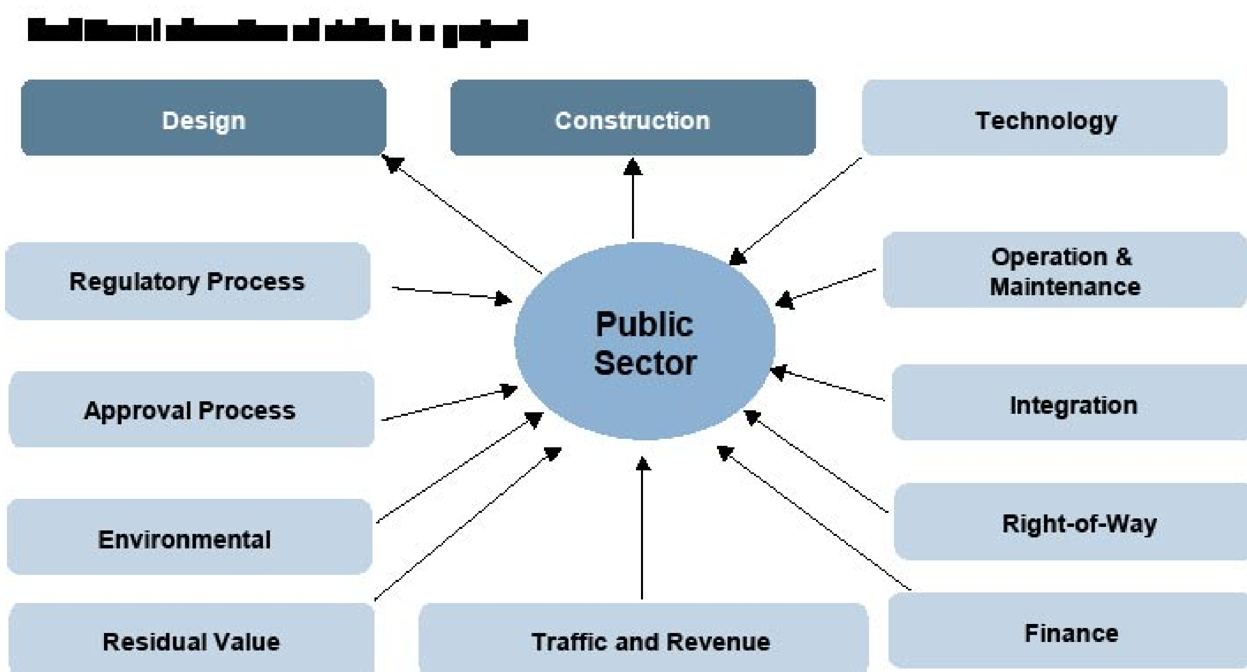
The Team will work closely with TxDOT, TxDOT's General Engineering Consultant (GEC), and TxDOT's Section Engineers as proposed facilities are developed to ensure that the impacts to the natural and social environment are minimized. This will be an iterative process. It will be critical that throughout this process the stakeholders be allowed to provide input to the Project. This input will be gathered through project websites, newsletters, and meetings.

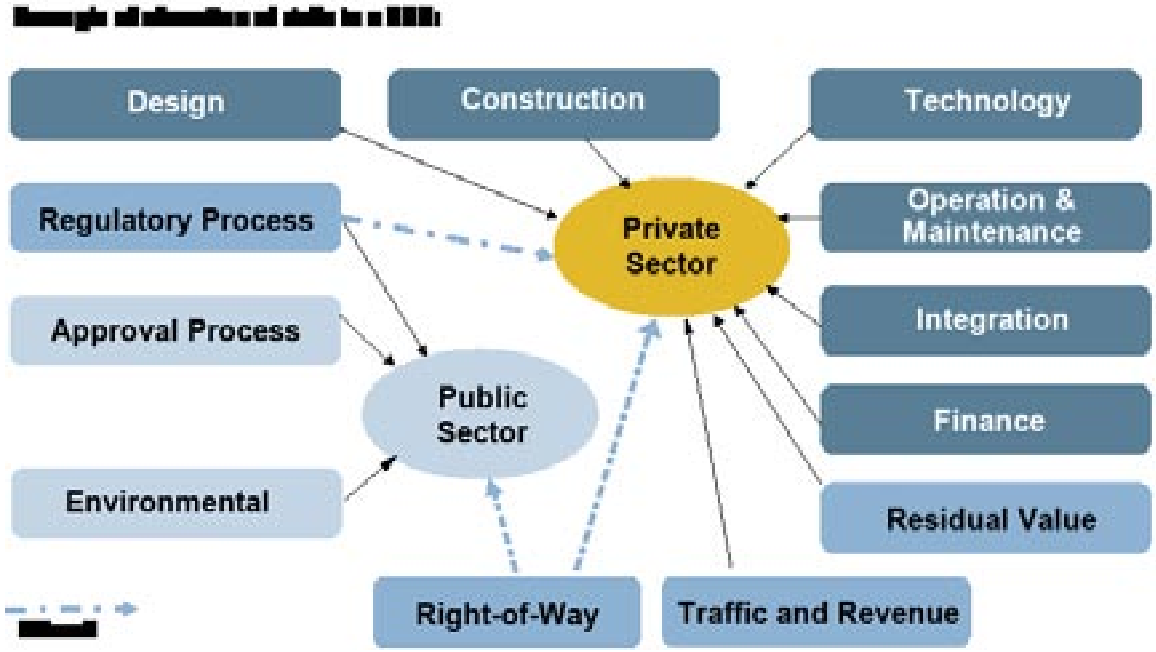
The Union Pacific Railroad (UP) is a major stakeholder that, due to its status as a common carrier railroad, has a somewhat unique relationship to the project. The Team will work through its rail consultants to solicit UP cooperation and project buy-in on an individual entity basis. This relationship with UP will be an iterative process.

4.3.1.4 Risk Approach

The Proposer's vision of risk management and risk allocation is based on the idea that the party that is able to manage each type of risk in the most efficient way should assume it.

The Proposer has relevant experience in sharing different type of risks with agencies from North America, Europe, Australia and South America. Under the typical concession scheme, the Developer/Sponsor would assume the traffic, operation, maintenance and financial risk, while transferring design and construction risk to a design-build joint venture that would enter into a lump sum fixed price contract with the sponsor.





This risk allocation ensures that the party in the best position with appropriate expertise manages the risks that will likely appear while developing TTC-35. This philosophy optimizes all stakeholders' skills, subsequently assuring that the project is developed in the most efficient way, and therefore bringing the best value to the State. This is a key element of a Public/Private partnership

The following table summarizes the risk allocation between the Developer/Sponsor and the Grantor (State) of a typical Public/Private Partnership (PPP) process. This risk allocation might be used in TTC-35, subject to further analysis of each specific Facility:

ALLOCATION OF RISKS		RESPONSIBILITY	
		Grantor	Developer
1	Project requirements / Change to design	X	
2	Right of way / Access to the land	X	X
3	Environmental permit	X	
4	Setting the toll rates	X	X
5	Changes in law	X	
6	Force Majeure	X	X
7	Design default		X
8	Geotechnical condition		X
9	Archaological	X	
10	Construction risk		X
11	Operation and Maintenance risk		X
12	Traffic		X
13	Financing conditions (market)		X
14	Interest rates from tender to contract award	X	
15	Financing structure		X
16	Alternative route (not planned)	X	

4.3.1.5 Phasing, Sequencing and Prioritization of Facilities

During the CDA, the Team, TTC-35 Section Engineers, TTC GEC and TxDOT will work together on the phasing, sequencing and prioritization of the TTC-35 project facilities. The Team's goal is to provide Facilities that benefit the State of Texas. There are many elements to the TTC-35 corridor (e.g. the roadways, toll facilities, potential rail lines, longitudinal utilities, potential service centers and complementary private development). The phasing and sequencing of each element will be studied in detail to ensure they are brought on-line at the appropriate time in the development of TTC-35, as discussed in Section 4.3.1.9. The Team has developed a listing of facilities anticipated to be ready for development, which will be discussed later in this section.

It is probable that for some period of time, the heavy-duty truck-only toll lanes (two in each direction) will accommodate both automobiles and trucks. However, as demand rises by TTC-35 users, it will be appropriate to add the less expensive automobile toll lanes to segregate the users, and allow for increased capacity on the toll lanes initially constructed.

At all times during the phasing of construction on TTC-35, every possible future element must be considered to ensure that near-term construction does not interfere with potential future work. An example of this consideration includes the planning of bridge structures that will overpass the TTC-35 corridor. The column locations for the roadway and potential rail alignments are fairly simple to anticipate. Possible future longitudinal utilities must also be considered. For example, if spacing of high-tension electrical transmission towers is not considered when identifying the location for roadway bridges, transmission lines could come in conflict with roadway bridges. Similarly, ease of future construction is important to consider when designing the first phase of the project. For example, construction of the outside truck-only lanes and providing for expansion to the inside will not only minimize cost, but also minimize the traffic disruption during the expansion phase. Additionally, when adding automobile capacity, it is probable that two lanes will be constructed in each direction initially, however, structures and earthwork for three lanes in each direction will be completed at the first capacity improvement to ease future widening construction.

Number and Phasing of Vehicular Lane Build-Out: The Team will perform detailed analysis of phasing interchanges, phasing the number of lanes for different sections of the corridor and providing input to TxDOT on the most efficient phasing plan for the corridor implementation from a financial perspective. This will help ensure the completion of the maximum amount of additional capacity for the State. The Facilities studied to-date have very different percentages of trucks projected to utilize them. These truck percentages will be studied carefully to ensure that construction of additional capacity matches the split between trucks and automobiles. The overall future demand will govern the ultimate number of lanes for each facility. However, the phasing and sequencing of each element will need to ensure that the toll facility remains competitive relative to free alternative routes or other travel modes, to maximize use. Therefore, the Team's analysis will not only look at the capacity of the toll facility in determining the optimum phasing requirements, but will also look at the capacity and resulting travel times on the major alternative routes / travel modes to ensure that the TTC-35 corridor is developed and phased in a manner that consistently provides an attractive route choice for the target users.

Facilities Anticipated to be Ready for Development: The Team has completed preliminary travel demand studies for all types of vehicles, including automobiles and trucks. It is anticipated that vehicular lanes will be at the top of TxDOT's priorities for developing Facilities along TTC-35. These lanes are also at the top of the Team's desired list of Facilities due to the ability to self-perform a concession and quickly bring a toll road Facility to completion and operation. Preliminary studies for Connecting Facilities have also been completed. These studies indicate the time horizons, and priorities for when these Facilities may be Ready for Development.

The following graphically depicts the proposed sequence of Facility Implementation. Also shown is a table summarizing the Near-Term Facilities, which includes the total number of mainlanes, tracks and length.

Facility Name	Lanes	Tracks	Length (miles)
SH 130, Segments 5 & 6	4		45.8
TTC-35 Dallas Southeast Connector	4		57.6
TTC-35 Northeast Connector	4		47.6
TTC-35 Georgetown to Temple	4		58
TTC-35 San Antonio Southeast Loop	4		25.6
TTC-35 Temple to Dallas Southeast Connector	4		106.1
UPRR Railroad Relocation (MoPac)		2	101.0

<u>Near-Term (2005 – 2010) Facilities</u>

After analyzing the potential Facilities for TTC-35, the following is the Team's prioritized list of Facilities anticipated to be Ready for Development during the near-term; in order of development, as determined by traffic, financial and engineering factors (see Section 4.3.1.7):

1. Austin – San Antonio Area, SH 130 – Segments 5 and 6.
    - Construction of previously approved general purpose toll lanes (two lanes in each direction), and non-tolled frontage roads (three lanes in each direction)
    - Expansion in 2040 to add four automobile toll lanes.
2. Dallas Area, TTC-35 Dallas Southeast Connector – Between IH 35E, IH 45, IH 20 and IH 30.
    - Construction of ultimate truck lanes (two lanes in each direction)
    - Expansion in 2020 to add four automobile toll lanes
    - Expansion in 2045 to add two additional automobile toll lanes
3. Dallas Area, TTC-35 Dallas Northeast Connector – Between IH 30 and US 75.
    - Construction of ultimate truck lanes (two lanes in each direction)
4. Austin – Temple Area, TTC-35, Georgetown to Temple – Between SH 130, Segment 1 and IH 35 North of Temple
    - Construction of ultimate truck lanes (two lanes in each direction)
5. San Antonio Area, TTC-35 San Antonio Southeast Loop – Between IH 10 and IH 37.
    - Construction of ultimate truck lanes (two lanes in each direction), and non-tolled frontage roads (two lanes in each direction)
6. Temple – Dallas Area, TTC-35 – Temple to TTC-35 Dallas Southeast Connector.
    - Construction of ultimate truck lanes (two lanes in each direction)
7. UP Railroad Relocation (MoPac) - Build new and upgraded rail facilities from Georgetown to San Antonio and relocate through freight rail service out of Austin and neighboring communities.
    - Build a double track rail mainline for UP from Georgetown to Seguin running east of Austin, San Marcos, New Braunfels and San Antonio
    - Improve the rail line from Seguin to San Antonio with a second track
    - Upgrade the rail line from Georgetown to San Marcos to permit implementation of commuter rail service coexisting with local freight service
    - Double track the rail line between San Marcos and San Antonio to permit freight and commuter services to coexist
    - Build a new classification yard for UP carload rail traffic south of San Antonio and reroute freight rail operations out of San Antonia to the extent possible
    - Build an intermodal facility or convert UP's South San Antonio yard to intermodal

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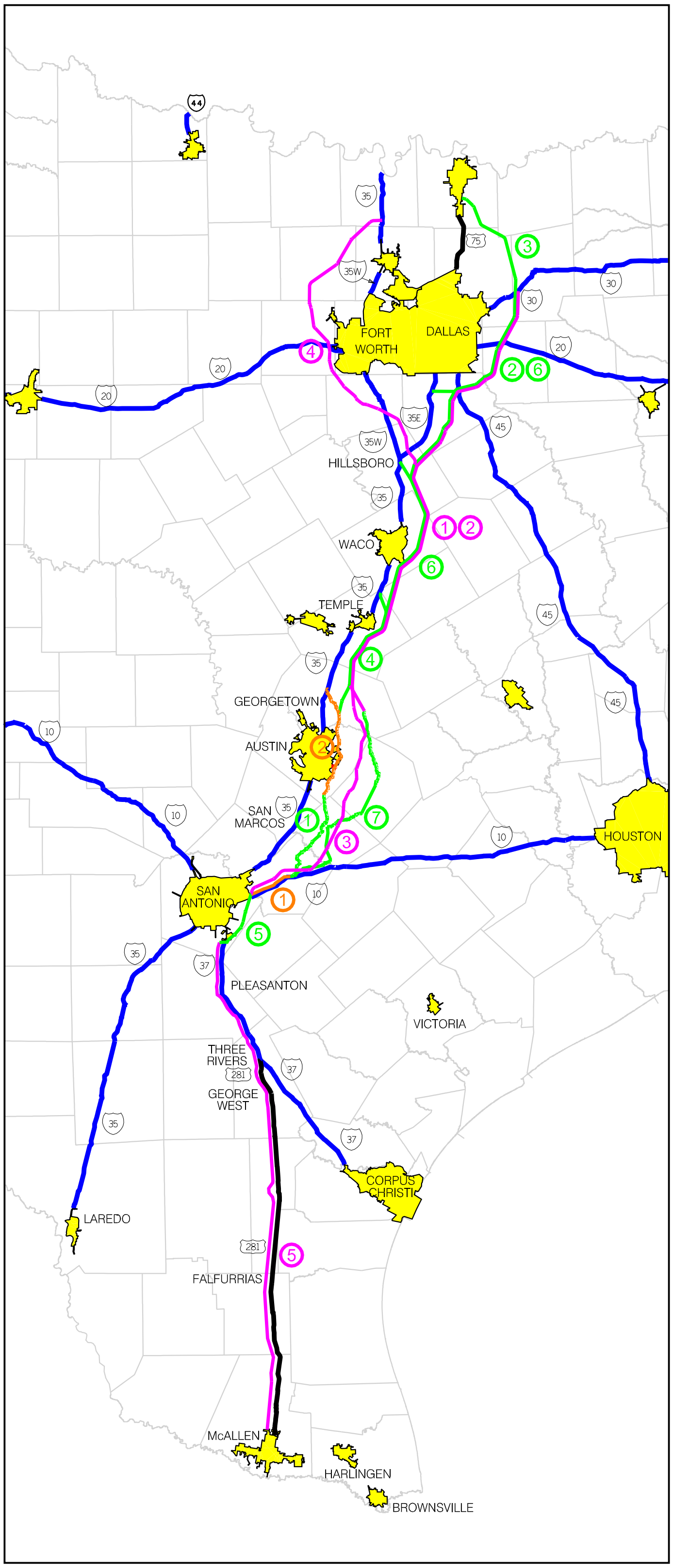

Near-Term (2005-2010) Facilities

1) SH 130, Seg 5 & 6 (General purpose mainlanes and frontage roads)
2) TTC-35, Dallas Southeast Connector (Ultimate truck lanes)
3) TTC-35, Dallas Northeast Connector (Ultimate truck lanes)
4) TTC-35, Georgetown to Temple (Ultimate truck lanes)
5) TTC-35, San Antonio Southeast Loop (Ultimate truck lanes)
6) TTC-35, Temple to Dallas Southeast Connector (Ultimate truck lanes)
7) UP Railroad Relocation (MoPac) (Double track)

Mid-Term (2010 - 2025) Facilities

1) IH 10 Expansion, Seguin to San Antonio Southeast Loop (General purpose mainlanes)
2) SH 130-Segments 1 to 4 (Truck Lanes)

Long-Term (2025-2055) Facilities

1) Dallas to Austin Freight Rail (Double track)
2) Dallas to Austin High Speed Rail (Double track)
3) Austin-San Antonio High Speed Rail (Double track)
4) TTC-35, Fort Worth Southwest & Northwest Connectors (Ultimate truck lanes)
5) TTC-35 - San Antonio to Rio Grande Valley (Ultimate Truck Lanes)

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EARTH TECH

FACILITY IMPLEMENTATION

- Upgrade and convert UP East Yard to commuter use to include a passenger station, coach yard, and coach and locomotive service and repair facilities.

Mid-Term (2010 – 2025) Facilities

As the time horizon shifts to the mid-term, potential Facilities for TTC-35 will include extensions of previously constructed portions of TTC-35, as well as capacity improvements to previously constructed Facilities. These will take the form of constructing the automobile toll lanes and segregating the automobiles and trucks. Of course, accuracy of predicting which Facilities are needed, and at what time decreases as the time horizon increases. The following list is the Team's anticipated Facilities Ready for Development during the mid-term, as determined by traffic and revenue growth models:

1. San Antonio Area, IH 10 Expansion - Between Seguin and San Antonio Southeast Loop.
   - Reconstruction of IH 10 (two tax lanes, and two toll lanes in each direction)
   - Placed in existing ROW
   - No additional interchanges
2. Austin Area, SH 130 – Segments 1 through 4.
   - Construction of automobile toll lanes (two lanes in each direction)
   - Segregate automobiles and trucks
   - No additional truck centers
   - No additional rest areas
   - No additional interchanges

Long-Term (2025 – 2055) Facilities

As the time horizon shifts to the long-term, predicting potential Facilities for TTC-35 becomes more nebulous, and is dictated more by business and engineering judgment, and less by traffic and financial models. The following list is the Team's anticipated Facilities Ready for Development during the long-term:

1. Dallas – Austin Area, Freight Rail – Between Dallas and relocated UP tracks.
   - Construction of dual track freight rail
2. Dallas – Austin Area, High Speed Rail – Between Dallas and Austin.
   - Construction of dual track high speed rail
   - Tie to currently planned Texas T-bone
3. Austin – San Antonio Area, High Speed Rail – Between Austin and San Antonio.
   - Construction of dual track high speed rail
4. Fort Worth Area, TTC-35 Southwest and Northwest Connectors – Between IH 35 North of Hillsboro to IH 35 North of Denton.
   - Construction of ultimate truck lanes (two-lanes in each direction)
5. San Antonio – Rio Grande Valley, TTC-35 – Near US 281 Corridor.
   - Construction of ultimate truck lanes (two-lanes in each direction)

4.3.1.6 Suggested List of Facilities

For this Proposal, an example Corridor was developed and evaluated within the general TTC-35 study area from near Oklahoma to the Mexico border, as identified in the *TTC-35 Study Area Identification Report*. The example corridor was designed under high-speed rail standards. The Team refined the alignment of the proposed TTC-35 Corridor based on aerial photography, environmental constraints and traffic projections (these elements are described in more detail elsewhere in this Proposal). The Team maintained a basic 1,200' footprint width from ROW-to-ROW in most locations. Because the currently under construction SH 130 will become a part of TTC-35, and it appears too late in the process to revisit ROW acquisition in this area, it was assumed that the typical TTC-35 width would split in the SH 130 area. Car and truck lanes would follow SH 130, and rail and utility facilities would be placed on a new alignment, further to the east.

The largest, and best, source of revenue for the TTC-35 Project will be derived from car and truck tolls. Therefore, the largest driver for developing a suggested list of Facilities is the potential toll revenue derived from traffic. The TxDOT-provided Statewide Analysis Model was used as the basis for traffic projections. The example TTC-35 Corridor alignment and interchanges were placed into the Texas network and coded as two 80 mph lanes in each direction. The no-toll condition was modeled to indicate the maximum possible traffic that could be anticipated on TTC-35 (e.g. pass-through tolls). This traffic was utilized to identify the list of potential near-term Facilities.

In addition to the TTC-35 Corridor Facilities, Connecting Facilities were also analyzed. While these additional Facilities may not fit the definition of the Trans Texas Corridor, it is important to consider the possibilities of including them in the overall picture of the TTC.

During the Initial Scope of Work, the Team will work with TxDOT and its engineering and environmental consultants to develop, evaluate and finalize the Corridor alternatives within the TTC-35 study area. The Team will begin by preparing exhibits and schematic layouts for these alternative alignments. Each alternative will usually maintain a 1,200’ footprint width from ROW-to-ROW. These alternatives will be evaluated against revenue, environmental, economic development, and passenger, freight and utility parameters. The Team will develop cost-efficient designs, exemplified by assessing the options for facilities overcrossing or undercrossing the TTC-35 corridor. Opportunities for minimum initial construction, followed by ultimate construction will be identified (e.g. building crossing structures only over the initial toll roads), followed in the future by structures crossing the entire TTC-35 Corridor.

The largest constraint to developing viable alignments is the high speed rail design criteria. Even if high speed rail is not considered viable, the corridor alignment must be established so as not to prevent future high speed rail development within TTC-35. Or, the TTC-35 Corridor must be split to allow the stringent high speed rail criteria, and less constrained roadway criteria to diverge. The Team will assist in ultimately identifying the preferred alignment that will advance to design and construction.

The engineering feasibility study will detail the possible options along the TTC-35 corridor. For example, this will include an analysis of different river and stream crossing alternatives to determine the most feasible and cost efficient methods of construction. From a broader prospective, the feasibility study will analyze the different routes for TTC-35 (e.g. place the alignment near communities to gain more traffic on the facility, at the risk of opposition from the community over noise or other impacts).

<u>Near-Term (2005 – 2010) Facilities</u>

After analyzing the potential Facilities for TTC-35, the following list is the Team’s Suggested List of Facilities for the near-term:

1. Austin – San Antonio Area, SH 130 – Segments 5 and 6 (45.8 miles). Segments 5 and 6 of SH 130 will provide for the continuation of the roadway portion of TTC-35 from the intersection of SH 130 Segment 4 and SH 45 Southeast to IH 10 in Seguin.
   - Construction of previously approved general purpose toll lanes (two lanes in each direction), and non-tolled frontage roads (three lanes in each direction)
   - Placed on previously approved ROW width
   - Utilized as general purpose toll lanes
   - 2 truck centers
   - 2 rest areas
   - Fully directional interchanges at:
     - SH 45 Southeast/US 183
     - US 183 North of Lockhart
     - IH 10
   - Diamond interchanges at:
     - Laws Road
     - SH 21
     - FM 1185
     - SH 80
     - FM 621
     - FM 20

2. Dallas Area, TTC-35 Dallas Southeast Connector – Between IH 30, IH 20, IH 45 and IH 35 E (57.6 miles). Beginning at IH 30, East of Dallas, this facility will provide a route around the Dallas area mainly for traffic going west to south and north to east. For the near term, a spur will be constructed to connect to the southern part of IH 35E. This will provide access to major existing facilities on both ends of the facility.
   - Construction of ultimate truck lanes (two lanes in each direction)
   - Placed on 1,200’ ROW width
   - Utilized as general purpose toll lanes

- 4 truck centers
- 3 rest areas
- Fully directional interchanges at:
  - IH 35E
  - IH 45
  - IH 20
  - IH 30
- Diamond interchanges at:
  - FM 813
  - US 175
  - US 80
  - SH 205
  - SH 276

3. Dallas Area, TTC-35 Dallas Northeast Connector – Between IH 30 and US 75 (47.6 miles). Beginning at IH 30, East of Dallas, and 6continuing North to US 75, this facility will provide a route around the Northeast Dallas area mainly for traffic going west to north and south to east. This will provide access to major existing facilities on both ends of the facility.

- Construction of ultimate truck lanes (two lanes in each direction)
- Placed on 1,200' ROW width
- Utilized as general purpose toll lanes
- 2 truck centers
- 2 rest areas
- Fully directional interchanges at:
  - US 75
  - IH 30 (included in the Near Term)
- Three-level Diamond Interchange at:
  - US 380
- Diamond interchanges at:
  - FM 902
  - FM 121
  - SH 121
  - SH 78
  - FM 981
  - FM 2194
  - SH 66

4. Austin – Temple Area, TTC-35 Georgetown to Temple – Between SH 130, Segment 1 and IH 35 North of Temple (58.0 miles). This facility will provide a route around the Temple-Belton area and connect into and provide a continuation of SH 130 going south. A spur will be constructed from IH 35 north of Temple to connect to the TTC-35 alignment. A second spur will be constructed from the TTC-35 alignment to SH 130, Segment 1 north of US 79.

- Construction of ultimate truck lanes (two lanes in each direction)
- Placed on 1,200' ROW width
- Utilized as general purpose toll lanes
- 3 truck centers
- 2 rest areas
- Fully directional interchanges at:
  - IH 35
- Diamond interchanges at:
  - FM 935
  - FM 438
  - SH 53
  - SH 190/SH 36
  - SH 95
  - FM 2268
  - FM 487
  - FM 971
  - FM 972
  - SH 29

5. San Antonio Area, TTC-35 San Antonio Southeast Loop – Between IH 10 and IH 37 (25.6 miles). This facility will provide a route around the San Antonio area to facilitate movement of people and goods from/to the east along IH 10, and from/to the Rio Grande Valley along IH 37. IH 10 and IH 37 will be connected by this facility.

- Generally following FM 518 and FM 1604
- Construction of ultimate truck lanes (two lanes in each direction), and non-tolled frontage roads (two lanes in each direction)
- Placed on 1,200' ROW width
- Utilized as general purpose toll lanes
- 2 truck centers
- 3 rest areas
- Fully directional interchanges at:
  - IH 10
  - IH 37
- Three-Level Diamond Interchange at:
  - US 181
- Diamond interchanges at:
  - US 87
  - FM 1346

6. Temple – Dallas Area, TTC-35 - Temple to TTC Dallas Southeast Connector (106.1 miles). This facility will provide a route around the Waco - Hillsboro and connect into and provide a continuation of TTC-35 between the Temple and South Dallas area. A spur will be constructed from IH 35 north of Hillsboro to connect to the TTC-35 alignment.

- Construction of ultimate truck lanes (two lanes in each direction)
- Placed on 1,200' ROW width

- Utilized as general purpose toll lanes
- 2 truck center
- 2 rest areas
- Fully directional interchanges at:
  - IH 35
  - US 287
  - TTC-35 Spur
- Three-level Interchanges at:
  - SH 6
  - US 77
- Diamond interchanges at:
  - SH 22 / SH 171
  - FM 1242
  - FM 2114
  - FM 308
  - SH 31
  - US 84
  - FM 2957
  - FM 434
  - SH 7
  - FM 878
  - SH 34
  - FM 308
  - SH 22
  - SH 171

7. UP Railroad Relocation (MoPac). Build new and upgraded rail facilities from Georgetown to San Antonio and relocate through freight rail service out of Austin and neighboring communities. (101 miles total: 63 miles double-track existing, 28 miles new double track).
   - Build a double track rail mainline for UP from Georgetown to Seguin running east of Austin, San Marcos, New Braunfels and San Antonio
   - Improve the rail line from Sequin to San Antonio with a second track
   - Outsource local freight service between Georgetown and San Marcos to a qualified rail operator
   - Upgrade the rail line from Georgetown to San Marcos to permit implementation of commuter rail service coexisting with local freight service
   - Double track the rail line between San Marcos and San Antonio to permit freight and commuter services to coexist
   - Build a new classification yard for UP carload rail traffic south of San Antonio and reroute freight rail operations out of San Antonia to the extent possible
   - Build an intermodal facility or convert UP's South San Antonio yard to intermodal
   - Upgrade and convert UP East Yard to commuter use to include a passenger station, coach yard, and coach and locomotive service and repair facilities.

<u>Mid-Term (2010 – 2025) Facilities</u>

As the time horizon shifts to the mid-term, potential Facilities for TTC-35 will include extensions of previously constructed portions of TTC-35, as well as capacity improvements to previously constructed Facilities. These will take the form of constructing the automobile toll lanes and segregating the automobiles and trucks. The following list is the Team's Suggested List of Facilities for the mid-term:

1. San Antonio Area, IH 10 Expansion - Between Seguin and San Antonio Southeast Loop.
   - Reconstruction of IH 10 (two tax lanes, and two toll lanes in each direction)
   - Placed in existing ROW
   - No additional interchanges
2. Austin Area, SH 130 – Segments 1 through 4.
   - Construction of automobile toll lanes (two lanes in each direction)
   - Segregate automobiles and trucks
   - No additional truck centers
   - No additional rest areas
   - No additional interchanges

<u>Long-Term (2025 – 2055) Facilities</u>

As the time horizon shifts to the long-term, intuition and engineering judgment, rather than traffic models, dictates predicting potential Facilities. The following list is the Team's Suggested List of Facilities for the long-term:

1. Dallas – Austin Area, Freight Rail – Between Dallas and relocated UP tracks.
   - Construction of dual track freight rail
   - Placed in previously acquired 1,200' ROW
2. Dallas – Austin Area, High Speed Rail – Between Dallas and Austin.
   - Construction of dual track high speed rail

- Tie to currently planned Texas T-bone
- Placed in previously acquired 1,200' ROW

3. Austin – San Antonio Area, High Speed Rail – Between Austin and San Antonio.
   - Construction of dual track high speed rail
   - Placed in previously acquired 1,200' ROW
4. Fort Worth Area, TTC-35 Southwest and Northwest Connectors – Between IH 35 North of Hillsboro to IH 35 North of Denton.
   - Construction of ultimate truck lanes (two-lanes in each direction)
   - Placed on 1,200' ROW width
   - Utilized as general purpose toll lanes
5. San Antonio – Rio Grande Valley, TTC-35 – Near US 281 Corridor.
   - Construction of ultimate truck lanes (two-lanes in each direction)
   - Placed on 1,200' ROW width
   - Utilized as general purpose toll lanes

4.3.1.7 Selection of Facilities / TxDOT Coordination

Selection of Facilities - Each of the near-term facilities identified in the previous Section were selected after considering the following criteria:

- Minimization of public finance
- Need / revenue projections
- Construction cost
- Anticipated political support
- Part of applicable state or regional transportation plan
- Existing environmental progress (e.g. EIS underway)

After the alignment of the entire TTC-35 corridor was developed, the Statewide Analysis Model (SAM) was updated to include the proposed TTC-35 alignments. The SAM 1998 and 2025 data was utilized to develop a 2010 demand model to project traffic on Facilities with a potential 2010, opening day. The demand model was then run for the no-toll 2010 condition. This would represent the maximum anticipated traffic on TTC-35 under a no-user-toll scenario (e.g. shadow tolls). The SAM output was then analyzed along the TTC-35 Oklahoma to the Mexico border. Sections of TTC-35 with significant traffic were identified for further analysis.

The potential near-term Facilities were studied against the criteria listed above. Several potential Facilities were removed from the final list of suggested Facilities based on more detailed study of the selection criteria. The suggested near-term Facilities rank well with respect to most of the selection criteria. The following table lists the studied Facilities and their anticipated advantages and disadvantages.

	Selection Criteria					
Facility	**Minimize Pub. Fin.**	**Revenue**	**Const. Cost**	**Political Support**	**State/Region Plan**	**Environ. Progress**
Dallas NE Conn.	●	●	○	◉	○	○
Dallas SE Conn.	●	●	○	◉	○	○
Georg. to Temple	◉	●	●	●	◉	○
Temple to SE Conn.	◉	◉	○	●	◉	○
SH 130 Seg. 5	○	●	●	●	●	●
SH 130 Seg. 5&6	◉	●	◉	●	●	●
SAT SE Loop	●	◉	○	◉	○	○
US 290 East	◉	○	◉	●	●	◉
UP Railroad Relocation (MoPac)	○	○	○	●	●	○
Loop 1 Expansion	◉	◉	◉	◉	●	◉
Trinity Parkway	◉	●	○	●	●	●

● - Positive Impact ◉ - Neutral Impact ○ - Negative Impact

TxDOT Coordination - During calendar year 2005, the Team will work with TxDOT, its TTC GEC and TTC-35 Section Engineers on producing the Master Development Plan (MDP) and Master Financial Plan (MFP). While this Proposal comprises this Team's Conceptual Development and Financial Plans, there will certainly be portions that can be modified to complement TxDOT's desires for TTC-35.

The Team will work side-by-side with TxDOT on each phase of the Plans to ensure the documents are realistic and achievable. In addition to the Austin-based staff who will be working directly with TxDOT, many more Team members will be supporting the Plan preparation. This includes staff from Cintra's Infrastructure development department. This department includes a financial and a technical team who have been in charge of developing and bidding transportation infrastructure for more than 20 years, and successfully bid projects in the USA, Canada, Australia, Spain, Ireland, Portugal, France and Chile among others. The financial team will bring expertise in evaluating and financially assessing all TTC-35 Facilities, and the technical team will add deep transportation engineering knowledge, especially regarding operation issues (tolling and connectivity planning), maintenance and traffic assessment. All of these remote Team members will bring their vast experience to bear on producing the plans that will guide the TTC-35 Project over the next 50 years. There will be times when multiple remote Team members can educate TxDOT on methods used successfully on other toll projects around the world.

4.3.1.8 Rest Stops, Service Centers and Auxiliary Facilities

The general philosophy for locating user-support facilities is to segregate the facilities by function.

Service centers for automobiles and truck will be located near urban areas and major crossing roadways. This lowers the cost of labor and goods required by the service centers. These service centers will include automobile and truck fueling facilities, including alternative fuels, and minor and major repair facilities. Service center locations can also serve as staging areas for Facility support, operations, maintenance and law enforcement.

Maintenance areas will be needed approximately every 50 to 80 miles to serve as bases for all maintenance-related operations. They will always be close to interchanges to allow access to all corridor roadways, and their size will vary from approximately 1.5 acres to five acres, depending on the Facility length they will serve.

All maintenance areas will include offices and ancillary buildings, maintenance vehicle garages and stockpiles.

If standard tolling collection systems are implemented, then toll management areas will be needed beside toll plazas. These will include tolling staff facilities and most important, the cash collection system.

Each toll facility will require a control building that will house the ITS control room, equipment room, back office and the main staff offices. Usually this building is located in the largest maintenance area of the Facility, where it would also provide the standard buildings of other maintenance areas.

Since rail and other facilities will also be located within the same corridor, the team will study, with TxDOT, the possibility to integrate all operation and maintenance facilities of all transportation modes, to enhance a comprehensive management of all TTC transportation facilities.

Rest areas will be located between the service centers, in more remote and potentially scenic areas of the State. The rest areas can include both the large full service rest areas, similar to those TxDOT is currently constructing, and the smaller scale picnic areas that serve as brief stopping points. Approximately two picnic areas will be provided between the larger rest areas, on about 30-mile spacing. The larger rest areas will include dedicated facilities for law enforcement personnel to promote security both at the rest area, and along the TTC-35 corridor.

Other auxiliary facilities will include restaurants and potentially hotels. These user-support facilities will be incorporated into the TTC-35 ROW. There will also be significant organic development along and outside the ROW, however, the Team will remain distant from these developments to avoid potential conflicts of interest.

4.3.1.9 Non-Investment Grade Traffic Studies

A. Introduction - The objective of this task is to develop a quantitative understanding of travel demands under various assumptions of corridor alignment, tolling strategies, and socioeconomic conditions. The information is a critical input in assessing network options, developing staging/project phasing plans, and determining financial feasibility. Given the large geographic area adjacent to the corridor, and the proximity to large urban centers and the international border, the traffic and revenue forecasting for the TTC-35 Corridor considers international, regional and local travel demands for both passenger car and truck traffic.

The existing Texas Statewide Model (SAM) is used as the primary basis for all of the travel demand forecasting analysis. The model is TransCAD based, and relies on geographical files such as the Texas Trunk Highway System and a zone structure built from census tracts. The SAM contains approximately 1,400 Traffic Analysis Zones (TAZs) inside Texas, approximately 57 buffer zones in the neighboring states, and approximately 81 external stations.

In addition, supplementary information has been gathered from the local Metropolitan Planning Organizations (MPOs) in the area, to verify some of the traffic outputs close the urbanized sections. This was in recognition that the statewide model may not have sufficient details with respect to the road network and traffic zones.

B. Basic Assumptions - Many of the basic assumptions for our analysis are the same as the ones used in the Texas Model. The Model has a base year of 1998, and a horizon year of 2025. For our analysis, it was necessary to also have traffic projections for the year 2010, being the anticipated opening period for many of the proposed toll facilities.

Year 1998 and 2025 road network information was obtained through the SAM Texas network. The key attributes for the road network information includes number of lanes, road name, functional class, and posted speed. For 2025, the road network includes projects that are to be built over the next 25 years in urban areas and over the next 10 years in the rural areas. Also, the 2025 road network accounts for future conversion of existing roads to toll roads that have already been planned by the TxDOT or MPOs. The 2025 base road network however does not include the Trans Texas Corridors or the proposed toll facilities that are being considered for this exercise. The 2010 road network assumes IH 35 widening to 6 lanes between Waco and San Antonio, and completion of SH 45 North and SH 45 South as toll facilities as per the SH 130 Development Plan.

The majority of demographic information for the Texas Model is derived from the US Census Bureau, and contains data on population, household size, income level and vehicle ownership. The information is critical in determining trip rates at the zonal level. Year 2025 population forecasts are derived from the Texas State Data Center. Population estimates for year 2010 utilized the 2000 Census information and 2010 population projection information from the Texas Water Development Board.

The primary source of the base year employment data was through the Counties, and the 1990 Journey-to-Work data by Census Tract. The data is broken by employment type (e.g. basic, retail and service) and is critical in developing trip attraction rates as well as freight movement analysis. The 2025 employment forecasts used the overall county level growth and growth predicted in specific area by individual MPOs. Estimation of 2010 employment level is based on a uniform employment growth between 1998 and 2025. In calculating the 2010 trip attractions, both the population and employment growth rates were considered.

Trip distribution tables for 1998 and 2025 from the Texas model were used for trip assignment purposes. The Texas model uses the Atomistic Model (refined Gravity Model) as a basis for distributing trips. The Texas model produces trip tables for the following seven trip purposes:

- Home based Work
- Home based Non-Work
- Non-Home Based
- Others/ External
- Period (intercity with trip length over 75 miles) Work
- Period (intercity with trip length over 75 miles) Non-Work
- External Through

This classification by trip purpose was useful in assigning trips for toll facilities since tolls affect each category of trips in different ways. Derivation of 2010 trip tables was based on utilizing the Fratar Factoring method applied to the 1998 trip table, and using the population and employment growth factor between 1998 and 2010 for each traffic zone.

Similar to the trip tables noted above, truck trip tables for the base year 1998 and the horizon year 2025 were obtained from TxDOT. Derivation of 2010 truck trip tables assumed a uniform growth rate between 1998 and 2025.

C. Methodology for Assigning Traffic - The 2010 and 2025 trip tables, as described above, are assigned to the different road network options that needed to be tested. The road network was revised to reflect the new road links. For purposes of this analysis new facilities are assumed to have a posted speed of 80 miles per hour. The assignment results are reviewed and compared with some of the other studies in the area, and adjustments are made if necessary. These studies include the Traffic and Revenue Forecast Study for Central Texas Turnpike System, Austin-San Antonio Super Regional Model, and Urban Transportation Studies by MPOs for Dallas-Fort Worth, and San Antonio.

For traffic assignments to toll facilities, a toll diversion model is used which is based on the binary logit functions that partition trips between the toll and non-toll facilities. The logit model essentially determines the probability of selecting a toll facility based on time and cost trade-offs. The probability reflects the share of trips between a given origin and destination that will utilize the toll facility. The form of the logit model is:

$$\text{Toll Share} = 1/(1+e^{u})$$

In the above equation, u is the utility expression. The utility expression for non-work trips is a function of the travel time difference between tolled and non-tolled facilities and toll costs. For work trips, there is an additional factor of income level. Coefficients and variables for calculating the utility expression vary for different trip purposes. There is also a utility function for trucks. In absence of the stated-preference survey specifically defined for the entire study area, coefficients and variables for the logit model were derived from various studies using a similar methodology for toll diversion.

In our analysis we found that the volume to capacity relationship to travel time is extremely critical in influencing the travel times and hence the toll share. Accordingly, we reviewed this volume to delay function being used in the Texas Model, and made adjustments to more appropriately reflect the conditions in the study area.

As indicated above, the income level is also an important factor for assignment of work related trips. For this analysis, we used the income level at the county level, and assumed that all traffic zones within that county would have the same income level.

Toll rates for SH 130 are assumed at the currently planned 12.5 Cents per mile for cars and 48 Cents per mile for trucks. For other toll facilities, the assumed toll rates are 15 Cents per mile for cars and 50 Cents per mile for trucks. These rates were based on average rates charged by NTTA and HCTRA.

The following outlines the key steps used in assigning traffic to toll facilities:

1. Assign the total trip table to the road network with the proposed toll facilities. Specify toll rates for cars and trucks associated with each of the toll roads.
2. From 1 above, skim travel times, auto toll costs, and truck toll costs for each origin-destination pair.
3. Assign the total trip table to the road network without the proposed toll facilities. This assignment only uses free facilities, whereas 1 uses both free and toll facilities.
4. From 3 above, skim travel times for each origin-destination pair.
5. From 2 and 4 above, calculate the travel time savings due to the toll facilities for each origin-destination pair.
6. Create a median income matrix based on income level at trip origin.
7. Using the probability model and outputs from the above steps, split each trip table (by trip purpose) into two trip matrices, i.e., “free share” (would not use the toll facility), and “toll share” (likely to use toll facility).
8. Combine each “free share” trip table by trip purpose into a total “free share” trip table.
9. Combine each “toll share” trip table by trip purpose into a total “toll share” trip table.
10. Assign the total “free share” trip table to the road network without the proposed toll facilities.
11. Assign the total “toll share” trip table to the road network with the proposed toll facilities.
12. Combine traffic assignments from 10 and 11 above into total auto assignment for the road network with proposed toll facilities.
13. Undertake steps 7 though 11 using truck trip table, truck toll rates, and the probability model for trucks to calculate truck traffic assignments on the road network with the proposed toll facilities.
14. Combine outputs from steps 13 and 14 to arrive at total (auto and truck) traffic assignments on the road network.

D. Gross Toll Revenue Estimation - The results of traffic assignments as outlined in the section above are used to calculate the gross toll revenues. Assigned traffic volumes for each section of the proposed toll facilities and the corresponding length of roadway in miles is used to calculate the daily vehicle miles traveled for each proposed toll facility. To convert these daily vehicle miles to the annual totals, it is assumed that there are 250 weekdays in a year and 115 days during weekends. Further, it is assumed that the weekend traffic is about 60% of the weekday traffic flows. When toll facilities are first constructed, it normally takes some time initially for these new facilities to mature in terms of attracting its ultimate level of utilization. Based on experience of other jurisdictions where toll facilities were recently built, this initial ramp-up period can range from one to two years. To minimize this period, some jurisdictions have allowed a free usage of their toll facilities for few months, and have significantly cut down the initial ramp-up period. For this exercise, to be on the conservative side, we suggest a ramp-up period of 2 years. Assuming that a toll facility is built in 2010, it would therefore mean that in 2010 (first year of operation), toll facilities would be expected to attract only 50% of assignment numbers; and in 2011 (second year of operation), 75% of assignment numbers. In 2012, toll facilities would reach their maturity level and would be expected to attract the projected assignment numbers for that year.

Based on 2010 and 2025 traffic assignments, gross toll revenues are calculated for the base and horizon years. For intermediate time frame and the period beyond 2025, the estimation of toll revenues assumes a uniform growth rate. The growth beyond 2025 is premised on a number of factors such as land use changes, population and employment growth in the study area and areas adjacent to the proposed toll facilities, level of congestion on parallel facilities, and level of service of the toll facility. For this exercise, we have assumed that a Level-of-Service (LOS) “C” needs to be maintained for the toll facility to attract its forecasted usage. This would mean that certain sections of the proposed toll facilities would have to be widened so that this level of service is maintained. As per the Highway Capacity Manual, a threshold of 18,300 in average daily traffic is used to determine the widening requirements from a traffic and level of service perspective.

It is anticipated that Value Pricing can be utilized to “even-out” the volume peaks of the Facility. Value Pricing will serve two purposes, improving peak LOS, and extending the LOS C life of the Facility before additional capacity expansion. TxDOT and the developer/sponsor will work together to determine the tolling strategies for each facility.

E. Assessment of Alternative Networks - For the longer-term network alternative, the traffic assignments along the Trans-Texas Corridor were estimated with variations around San Antonio and around Dallas-Fort Worth. At this stage, total traffic volumes were developed without tolls to gain a general appreciation of attractiveness of the facility and to assess the alternatives around San Antonio and Dallas from a traffic volume point of view.

The methodology and the level of detail were relatively more comprehensive when assessing the network alternatives in the near-term. The methodology basically followed the steps outlined in the above section. The following toll facilities were assessed as part of the roadway network.

Trans Texas Corridor Sections

- TTC-35 Dallas Northeast Connector – Between IH 30 and US 75.
- TTC-35 Dallas Southeast Connector – Between IH 35E, IH 45, IH 20 and IH 30
- TTC-35 Georgetown to Dallas Southeast Connector
- SH 130, Segments 1-4
- SH 130, Segment 5
- SH 130, Segment 6
- TTC-35 San Antonio Southeast Loop – Between IH 10 and SH 37

Connecting / Complementary Facilities

- Dallas Area, Trinity Parkway - Between SH 183 / IH 35 split and US 175 / IH 45 split
- Austin Area, US 290 E – Between US 183 and SH 130

- Austin Area, Loop 1 - Between Loop 360 and Parmer Lane

F. Sensitivity Analysis - There are a number of factors, which would impact the traffic forecast for the corridor. Our analysis indicated that different toll rates and variation in volume to delay relationship are the most significant factors impacting traffic assignments and associated toll revenues. Our analysis also indicated that the volume to delay function is much more critical in highly urbanized areas where congestion level is normally higher and there are many alternative routings available to the user. Impact of tolling structure is more pronounced when there is a parallel non-toll facility available within the corridor. It is acknowledged however that there are other factors such as general economic climate, level of development, and availability of competing modes that can have a significant impact on traffic volumes on toll facility.

G. Projections beyond 2025 - As indicated earlier, the Texas model has the horizon year of 2025. For the financial model, it is necessary to have toll revenue values until the year 2060. For projections, beyond 2025, the analysis included consideration of the trends between 1998 and 2025 as well as population projections beyond 2025. Specifically, the following information was used in the analysis:

- Growth in number of auto and truck trips for whole of Texas between 1998 and 2025 based on the Texas Model
- Growth in population and employment for Texas between 1998 and 2025.

Population growth for each urban area (Dallas, Austin and San Antonio) between 2025 and 2060 was studied in two time intervals (2025 to 2040 and 2041 to 2060) based on information from the Texas Water Development Board.

4.3.1.10 Conceptual Diagrammatics (Near-Term)

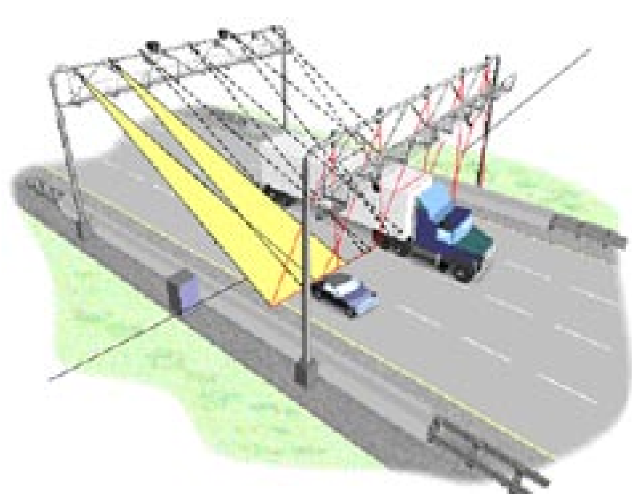
A. Innovative Techniques and Technology - The scale and characteristics of the near-term Facilities, together with the impacts for State of Texas, demand the most innovative engineering and technological techniques. These solutions will reduce cost, environmental impacts and user delay that, even if individually small, will accumulate and have a large impact in the State's economy and society.

Cintra is currently operating one of three fully automated free-flow electronic tolling systems in the world (407-ETR in Toronto, Canada, which was the first in the world to be implemented).

With this system, all vehicles may use the highway, with or without transponder. When the vehicle enters the tolling station, the system will read the transponder's data and/or take a digital image of the license plate. This information is sent to the Toll Transaction Processor (TTP) in the Operations Center by fiber-optic cable.

If the system found a transponder, the information is immediately processed and the variable toll rate shown on the VMS signs prior to all entrances is applied to the account to be billed according to the users desired billing procedure.

If no transponder is found, license plate images are read by a specially designed state-of-the-art Optical Character Recognition (OCR) software. If the vehicle owner's data is not available from public databases, an automatic interface application to the vehicle registry database provides the required data for billing.



At the end of the process all trips will have generated an invoice or electronic charge to be paid by the user by different means (cash, credit card, bank account).

The Advantages of this system are the following:

- Transponders are not required
- If a valid transponder is not detected, digital photograph(s) are taken at entry & exit
- It includes Video Exception Processing to apply image enhancements and operator input
- License Plate Pattern Verification with the objective of reducing Operator typing errors

More details of this and other studied tolling systems can be found in Section 4.3.1.16 and in the Appendix.

B. Preliminary Scaled Drawings - The following typical section, intersection and interchange layouts, and plan-and-profile drawings represent very preliminary design for the Facilities that appear ready for development in the near-term. The plan view of these 1”=2,000’ drawings show each Facility’s centerline, its proposed right-of-way footprint, mainlanes, ramps and major structures. The profile view depicts the potential mainlane profile grade line. All of these features would be further refined during more detailed analysis, but they are of suitable accuracy for Facility pass/fail feasibility.

Due to space limitations, the Facilities identified as TTC-35, Temple to Dallas Southeast Connector and MoPac Relocation are in the Appendix.

C. Verification of Cost Estimate Assumptions - The conceptual cost estimates are included in the Appendix. These cost estimates are based upon the major components of the Facilities, including utilities, roadway, interchanges, structures and toll structures. Detailed cost estimates for the TTC-35, Dallas Southeast Connector and SH 130, Segments 5 and 6, also found in the Appendix, determined per-mile, and per-each costs utilized in the other Facilities. The detailed cost estimates include quantities of items at the TxDOT bid level, multiplied through the TxDOT bid-tab unit prices.

D. Access Management Plans Development Approach - The Team recognizes the potential for commercial and residential development along the Corridor. The Team also recognizes the benefits of access management, which include safety, continued operational efficiency, and additional economic development. The Project will be developed having access management as a key factor in design.

The approach the Team will take in developing the access management plans will be to work closely with the TxDOT District offices, local jurisdictions, and the property owners themselves. The Team will first determine if the area has established access management plans and/or ordinances and, if present, will review according to TxDOT’s Access Management Manual and the Transportation Research Board’s Access Management Manual. If changes should be made, the Team will work with local jurisdictions to refine the plans. If the area does not have a plan, the Team will take the lead in establishing a plan for the Project area. For both situations, the Team will analyze the land use data (existing and projected population, land use mix, etc.) and the traffic (existing and projected) for the area. This will help in the design of the Project as far as the need for frontage roads and local access roads.