



Moving Into Prosperity

The Potential Impact of the Trans-Texas Corridor on Business Activity in Texas: An Analysis of the Effects in Key Trans-Texas Corridors and the State of Texas



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SUMMARY OF KEY STUDY FINDINGS



Key Findings from This Analysis

- The Trans-Texas Corridor (TTC) is a proposed statewide network of multi-use transportation routes that will be completed as justified by traffic patterns and economic feasibility. The TTC will significantly increase transportation capacity and relieve some of the current traffic congestion across Texas. It represents an innovative mechanism to leverage scarce resources in an optimal manner.
- Although the TTC involves substantial costs, these will be spread over time and will involve both public and private entities. Using land in this manner will cause only a minimal reduction in the property tax base and property taxes, but stands to bring gains to areas proximate to the routes and surrounding regions which far outweigh any such losses. Individuals and businesses able to utilize the improved highway infrastructure will also benefit, and the competitiveness of the state will be significantly enhanced.
- The economic stimulus associated with development of the TTC system is quite substantial; The Perryman Group quantified these gains under a conservative set of assumptions. Over the next 25 years, the **cumulative** overall benefits of the TTC-35 (a corridor that essentially parallels the current Interstate 35) are estimated to include **\$1.429 trillion (in constant 2005 dollars) in Gross State Product (\$845.5 billion on a net present value basis) and 14.829 million person-years of employment.** Over a 50-year horizon, the benefits are even larger. Other corridors, such as the proposed TTC-69, also generate substantial benefits.
- The TTC is vital to relieving congestion, increasing safety, enhancing efficiency, and improving the prospects for economic development and trade. In fact, such infrastructure will serve as a significant incremental stimulus to the future prosperity of the state economy.



INTRODUCTION



Trans-Texas Corridor Initiative Overview

- The Trans-Texas Corridor (TTC) is a proposed statewide network of multi-use transportation routes that will be completed as justified by traffic patterns and economic feasibility. The primary purpose of the TTC is to provide more efficient and safer transportation of goods and people across Texas. The TTC was conceived as a long-term solution to alleviate current traffic congestion and meet the future transportation needs of the rapidly growing population and economy of Texas. It is designed to bring innovative public-private partnerships into the process of infrastructure development, thus leveraging State resources to increase the level and accelerate the timing of new projects.
- An early conceptualization of the TTC was published in June 2002 in a document titled *Crossroads of the Americas: Trans-Texas Corridor Plan*. This initial concept envisioned a 4,000-mile network of facilities across the state and identified four priority corridors: TTC-35, TTC-69, TTC-45, and TTC-10.
- Current efforts are focused on the development of two major corridors that transverse the state: TTC-35 and TTC-69.
- TTC-35 master development plan work began in June 2005. Although the exact route of TTC-35 has not been determined, the TTC-35 conceptual route generally parallels I-35 stretching from north of Dallas-Fort Worth (Denison) to Mexico (Laredo) and possibly the Rio Grande Valley (McAllen). Construction of TTC-35 could begin in late 2006.
- The current timeframe for development of TTC-69 has not been specified, but is likely to be initiated after TTC-35 and well before 2030. The conceptual route for TTC-69 generally parallels the proposed Interstate 69 from Texarkana/Shreveport to the Rio Grande Valley or Laredo.
- Plans now call for the potential development of the other corridors (TTC-45, TTC-10, and others) after TTC-69 as demand warrants.



Trans-Texas Corridor Key Transportation Benefits

- Today's interstate highway system has been in existence for several decades and does not have adequate capacity to meet current and projected requirements. Because of transportation system inadequacies, efficiency and safety have declined. Transportation efficiency and safety are two factors that have human and financial consequences.
- Although the Texas Department of Transportation (TxDOT) maintains an active program (spending several billion dollars each year in State and federal funds) of maintaining and upgrading existing roadways and extending capacity, it is estimated that traditional approaches and resources can only meet about 36% of significant needs. It is anticipated that many desirable initiatives will face extensive delays in the absence of public-private partnerships. Moreover, studies by the Texas Transportation Institute reveal that the level of congestion and the associated costs to the economy are increasing each year in the major urban centers of the state.
- The TTC has the potential to significantly improve transportation capacity and relieve some of the current traffic congestion across Texas. In this way, the TTC will increase both transportation efficiency and transportation safety, which will enhance the health and economic prosperity of Texas.
- Traditional funding mechanisms will not keep pace with future needs, thus causing ongoing losses in efficiency and competitiveness. Thus, innovative mechanisms are essential to maintain and enhance economic opportunities within Texas.
- With the growing population and expanding economy of Texas, transportation constraints and congestion will only worsen over the coming years. The TTC will improve the transportation capacity to meet the long-term growth needs of the Lone Star State.



Trans-Texas Corridor Key Economic Benefits

- The TTC can reduce the time and cost of transporting goods and services across Texas. In addition, reliability and safety will be enhanced. These improvements will have secondary benefits such as allowing lower inventory levels for companies with operations in Texas and reducing costs to consumers of purchases within the corridors.
- The improved system of transportation will increase productivity and earnings of companies operating within the state, and improve the attractiveness of Texas as a location for other businesses. With decreasing congestion and the resulting positive impact on quality of life, the state also becomes more attractive as a location for knowledge-based firms and other desirable forms of business activity.
- The TTC development will stimulate business activity and investment in the areas along the corridor routes, increase the ability of companies within the region to expand intrastate trade and operations, and improve the ability of companies within the state to increase market size and market share on a global basis.

Bottom Line: The Trans-Texas Corridor will lead to gains in productivity and efficiency, key factors in regional economic growth.



Purpose of This Study

- The Perryman Group (TPG) was asked to analyze the current conceptualization of the Trans-Texas Corridor including the proposed corridor routes for both TTC-35 and TTC-69 and other, less-immediate projects.
- This study incorporates an analysis of the costs and benefits of the TTC from the perspectives of industry, business development, municipalities, farmers and ranchers, and other stakeholders.
- The TPG study also includes an analysis of the economic impact of constructing and implementing the TTC over 25 and 50-year periods on expenditures, gross product, personal income, and permanent jobs, as well as other potential investments.
- Finally, the study provides an analysis of the sensitivity of the economic impacts to various changes in parameters such as private financing, population growth, travel efficiency, value capture, risk, and fiscal outlays.



The Perryman Perspective

- The Perryman Group is an economic analysis firm based in Waco, Texas with extensive experience in economic impact assessment.
- The firm has spent decades studying the Texas economy and has developed complex models of the US and Texas economies as well as all Texas metro areas. In addition, the firm has provided specific-industry forecasts for hundreds of private sector clients including Fortune 500 companies, investment bankers, and commodity and transportation-related entities.
- Led by Dr. M. Ray Perryman, the firm has performed hundreds of economic impact assessments, including dozens of major transportation-related analyses. The models used in this analysis have been maintained, updated, and expanded over more than 20 years. They have been used by numerous governmental entities, including the US Department of Transportation, Commerce, Housing and Urban Development, Agriculture, Defense, Labor, the Interior, and Energy. They have also been used by the US House of Representatives, the US Senate, and the Office of the President. Within Texas, the systems maintained by TPG have been used by the Office of the Governor, the Office of the Lieutenant Governor, the Office of the Speaker, the Texas House of Representatives and the Texas Senate (more than 20 separate committees), the Texas Commission of Environmental Quality, the Texas Railroad Commission, the Texas Workforce Commission, the Texas Department of Transportation, the Public Utility Commission of Texas, the Texas Motor Vehicle Commission, the Office of Economic Development and Tourism, the Office of Rural and Community Affairs, the Texas Commission on the Arts, the Teacher Retirement System of Texas, and many other governmental entities.



THE TRANS-TEXAS CORRIDOR



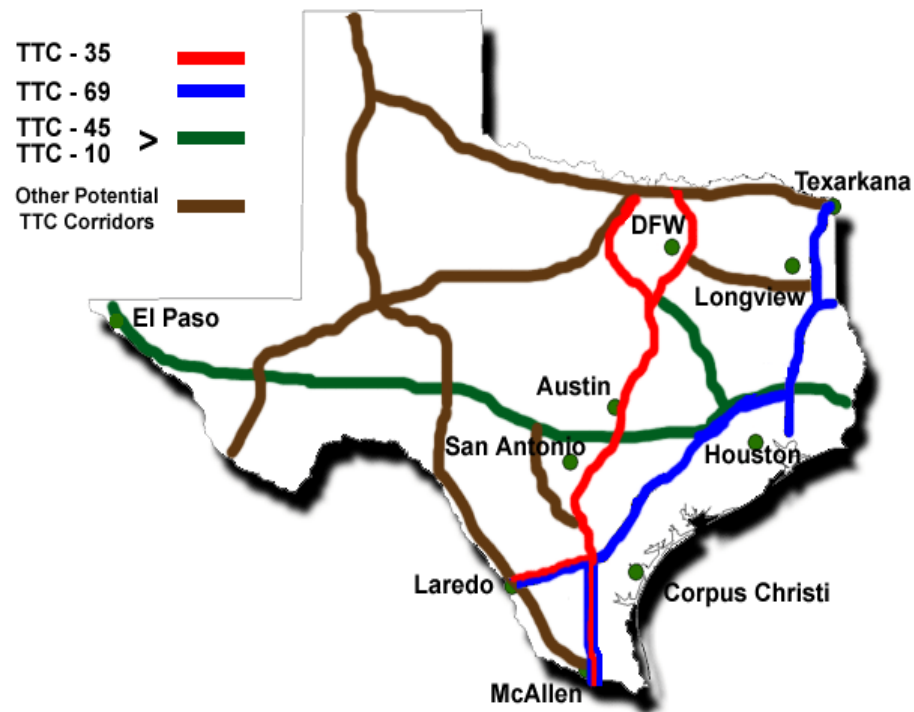
The Proposed Trans-Texas Corridor

- As noted, the TTC is a multi-use, statewide network of transportation routes to be sited primarily through areas of Texas without significant urban development, thus notably reducing costs and time requirements.
- The TTC concept includes separate lanes for passenger vehicles and large trucks as well as freight railways. Other potential TTC components include high-speed commuter rail and infrastructure for various utilities.
- Current plans call for the TTC construction in phases over an extended time horizon. The TTC-35 route generally parallels Interstate 35 with construction scheduled to begin in late 2006; the TTC-69 route generally parallels the proposed Interstate 69 with construction slated to begin at some point prior to 2030.
- The funding for the Trans-Texas Corridor will be through public/private partnerships, with substantial investments and involvement from private entities.



The Trans-Texas Corridor Conceptual Plan

- The exact routes of the Trans-Texas corridors have not yet been determined; approximate locations are as shown. TTC-35 is scheduled for near-term development, followed by TTC-69. No timing has been determined for the remaining elements of the conceptual plan.





The TTC-35 Corridor

- The TTC-35 route is estimated to be approximately 800 miles long and a maximum of 1,200 feet in width (less than ¼ mile).

- The construction of TTC-35 over the next 25 years is scheduled to be divided into three phases:
 - Near-term (2006-2011) facilities include segments from North Texas to near San Antonio with a total estimated design and construction cost of \$9.81 billion.
 - Mid-term (2011-2026) facilities include connectors in the San Antonio and Austin areas with a total estimated design and construction cost of \$0.45 billion.
 - Long-term (2026-2030) facilities include segments from San Antonio to the Rio Grande Valley and a Fort Worth connector with a total estimated design and construction cost of \$2.81 billion.

- Other segments of the “conceptual” plan for TTC-35 may occur subsequently.



The TTC-69 Corridor

- Although development of TTC-69 is not as far along as that of TTC-35, the conceptual route for TTC-69 generally parallels the proposed Interstate 69.
- TTC-69 will be part of a planned 1,600-mile national highway system connecting Mexico, the US, and Canada.
- The corridor for the route is estimated to be approximately 1,000 miles long and a maximum 1,200 feet in width (less than ¼ mile).
- Construction of TTC-69 is scheduled to begin at some point prior to 2030 and has a total estimated design and construction cost of \$21.53 billion (road only).



**ROLE OF THE
TRANS-TEXAS CORRIDOR
IN THE FUTURE PROSPERITY
OF TEXAS**



Current Mobility Problems in Texas

- Economic growth and population expansion have left Texas with a crowded transportation system, particularly in major urban areas.

- In 2003, the annual delays per traveler in the state's largest metros were:
 - Dallas-Fort Worth Area: 60 hours
 - Houston: 63 hours (ranked 3rd among the national urban areas)
 - San Antonio: 33 hours
 - Austin: 51 hours

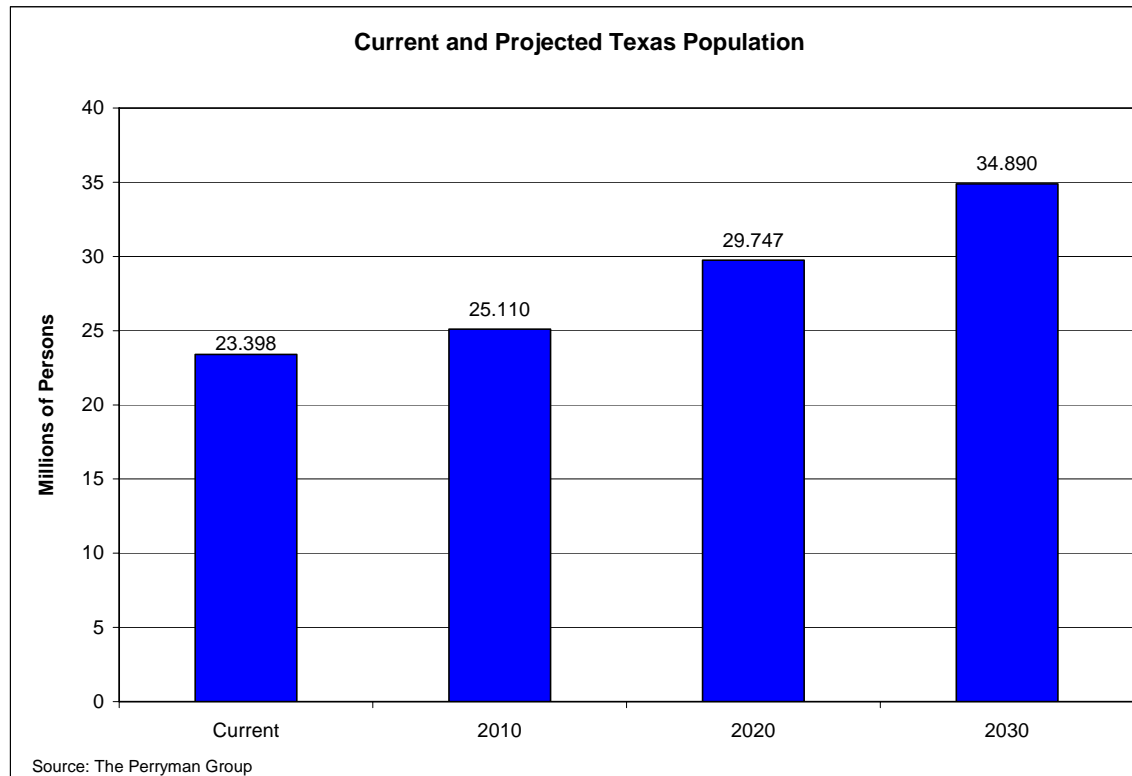
- Travel time indices in the Metroplex and Houston areas have increased notably. The annual hours of delay per traveler in the Metroplex increased from 14 in 1982 to 60 in 2003, the 3rd largest increase in long-term change out of 85 urban areas in the US. Problem congestion in the Metroplex caused about 151 million hours of travel delays, 83 million gallons of excess fuel consumption, and cost \$2.5 billion in 2003.

- The value and volume of highway freight has increased dramatically; this trend is expected to continue. Truck traffic accounted for 20% of average annual daily traffic on the Freight Analysis Framework road network. The value of Texas Merchandise Transport trade increased from \$30 billion in 1996 to \$77 billion in 2002. From 1998 to 2020, the value of highway freight is projected to more than triple according to the Federal Highway Administration. Even when adjusted for inflation, the growth in Merchandise Transport was in excess of 130% from 1996 through 2002. When measured in tons, the expected increase in highway freight is 76.8% through 2020. The Texas Department of Transportation projects that road use will rise by 214% over the next 25 years, while traditional funding mechanisms will only support a 6% increment to capacity.



Texas Population

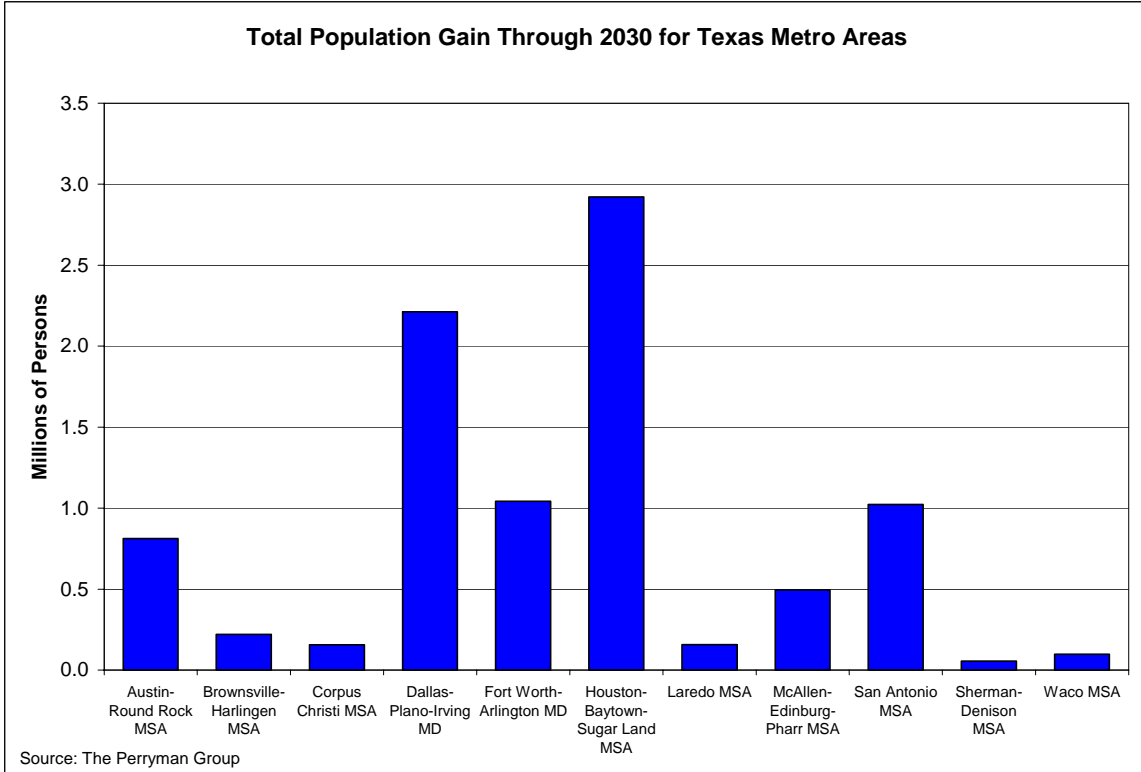
- The Texas population is expected to reach approximately 35 million in 2030, a substantial gain from the current level of some 23 million. With this population expansion will come increased pressure on highway systems.





Metro Area Population Growth

- Much of the state's population expansion will occur in the largest metropolitan areas. The Houston-Baytown-Sugar Land area alone is projected to see the addition of almost 3 million persons by 2030. The Metroplex (Dallas-Plano-Irving and Fort Worth-Arlington combined) is expected to experience even larger gains.





Need for Additional Infrastructure

- Given expected growth in the population and economy of the state, the already congested highway system is likely to be pushed well beyond its capacity. New investments are essential to ensuring prosperity in the decades to come.

- From the perspective of Texas businesses, new highway infrastructure can
 - lower travel costs and time;
 - increase the earnings of industries that produce nationally traded goods;
 - reduce operating costs of businesses or enhance the market size of businesses, both of which work to raise market share;
 - reduce logistics costs through decreased inventories and lowered transportation costs; and
 - reduce time variability, thereby allowing for optimized schedules and routes of distribution of certain products.

- The enhanced infrastructure will also expand output and earnings in counties located directly on or proximate to the highway; regional production will climb due to the construction of the highway and businesses locating in the area due to the transportation improvements. Output will be expanded due to higher “value capture” within the regions as a result of lower costs outlined above and greater competitiveness on a global basis due to enhanced efficiency.



What the Trans-Texas Corridor is Not

- Many erroneous or exaggerated theories have circulated regarding the TTC initiative. Over the course of this analysis, TPG research led to the following conclusions.
 - MYTH: Business will be taken away from Texas communities.
 - REALITY: The TTC will allow Texas businesses to become more efficient and will stimulate economic growth. The gains from the initiative will offset any observed losses many times over.
 - MYTH: There will be no access to the TTC.
 - REALITY: There will be access to the various TTC routes from towns as well as rural areas. Transportation arteries must be accessible in order to generate the traffic needed to justify private investment and the commitment of public resources.
 - MYTH: The TTC is too expensive.
 - REALITY: The TTC segments will be built over time and by a public/private partnership to minimize the cost to taxpayers. Because of the commitment of private equity funding, segments will only be developed as justified on economic grounds. Moreover, the benefits will far outweigh the costs. If the anticipated returns do not justify the expense, rational private investors will not commit the needed funds.
 - MYTH: Thousands of acres will be removed from the property tax rolls.
 - REALITY: A relatively small portion of rural land will be required and this will result in a minimal loss of property taxes. These amounts will be far more than offset by gains from enhanced business activity. All transportation infrastructure requires right-of-way acquisition.
 - MYTH: Farmers and ranchers will be forced to drive long distances to cross the corridor.
 - REALITY: Routes will be considered that minimize the impact on landowners. Landowners will be fully compensated for any required right-of-way, and the stimulus to agricultural interests will far exceed any production losses.
 - MYTH: The corridor will not solve urban traffic congestion.
 - REALITY: The corridor will add a significant amount of capacity that will relieve much of the congestion due to traffic passing through urban areas. This study indicated substantial additional efficiency, as did a recent “travel time” analysis by Wilbur Smith Associates.
 - MYTH: The Texas Department of Transportation will build service centers that compete with local businesses.
 - REALITY: Customer service centers will not be built by the Texas Department of Transportation, but by private businesses. Competition among private entities will be market based, which works to the benefit of consumers.
 - MYTH: Interstate 35 and other current infrastructure will be abandoned.
 - REALITY: Current interstate highways will not be abandoned; expansion and maintenance will continue as planned. In fact, one of the key principles of the TTC initiative is to leverage private resources to allow the State to have more resources available for infrastructure projects.



Land Acquisition Effects for TTC-35

- The TTC-35 route is approximately 800 miles long with a maximum width of 1,200 feet (about ¼ mile) and will require the **acquisition of at most 116,400 acres of land (primarily rural land)**.
- The conceptual route for TTC-35 would pass through about 24 Texas counties, although this number may vary somewhat based on the final route determined for the corridor.
- The acquisition of the required land for TTC-35 is estimated to **reduce the property tax base by about \$93 million (some 0.04%)** over the multi-county area the conceptual route would pass through. (This estimate is based on typical agricultural use values within the relevant areas. To the extent less “productive” land is used, this amount will be reduced; to the extent non-agricultural land is acquired, it will increase.)
- The acquisition of the required land for TTC-35 is estimated to **reduce annual property taxes by approximately \$2.8 million (close to 0.04%)** over the multi-county area the conceptual route would pass through. (This estimate is based on typical agricultural use values within the relevant areas. To the extent less “productive” land is used, this amount will be reduced; to the extent non-agricultural land is acquired, it will increase.)
- The acquisition of the required land for TTC-35 is estimated to directly **reduce agricultural (farm and ranch) production by about 1.0%** for the multi-county area the conceptual route would pass through, even assuming all of the acquired land is in full production. For the overall study area, the reduction is only about 0.3%. This amount is expected to be more than offset by the stimulus derived from TTC-35.



Land Acquisition Effects for TTC-69

- The TTC-69 route is approximately 1,000 miles long with a maximum width of 1,200 feet (about ¼ mile) and will require the **acquisition of at most 145,500 acres of land (primarily rural land)**.
- The conceptual route for TTC-69 would pass through about 27 Texas counties although this may vary somewhat based on the final route determined for the corridor.
- The acquisition of the required land for TTC-69 is estimated to **reduce the property tax base by about \$58 million (some 0.06%)** over the multi-county area the conceptual route would pass through. (This estimate is based on typical agricultural use values within the relevant areas. To the extent less “productive” land is used, this amount will be reduced; to the extent non-agricultural land is acquired, it will increase.)
- The acquisition of the required land for TTC-69 is estimated to **reduce property taxes by approximately \$1.8 million (close to 0.06%)** over the multi-county area the conceptual route would pass through. (This estimate is based on typical agricultural use values within the relevant areas. To the extent less “productive” land is used, this amount will be reduced; to the extent non-agricultural land is acquired, it will increase.)
- The acquisition of the required land for TTC-69 is estimated to **reduce agricultural (farm and ranch) production by about 1%** for the multi-county area the conceptual route would pass through, even assuming every acre that is acquired is fully productive. For the larger study area, the reduction is only about 0.6%. This amount is expected to be more than offset by the stimulus derived from TTC-69.



A Broader Perspective on Land Acquisition

- The acquisition of land is a necessary part of any infrastructure expansion. It is also, understandably, typically one of the more controversial aspects of the process. As will be demonstrated subsequently in this report, the net increase in economic value will far outweigh the costs with respect to TTC even under very conservative assumptions. These gains extend to the agricultural sector and fiscal revenues, with the benefits to governmental entities being many times as large as foregone tax collections. Due to the importance and concern associated with this issue, it is appropriate to offer a broader perspective.

- Given the congestion situation presently confronting many parts of Texas and projected future traffic patterns, it is imperative that appropriate responses be implemented. The alternative is reduced efficiency, loss of competitiveness, worsened environmental conditions, and a diminished quality of life. Although there are many possible approaches, they can be broadly classified into three categories:
 - expand vertically on existing right-of-way,
 - acquire additional right-of-way adjacent to existing lanes and expand horizontally,
 - acquire right-of-way in new locations and expand in corridors some distance away from existing major roadways.

- Vertical construction is typically approximately three times as expensive as horizontal development. Consequently, it is highly unlikely that tolls or other revenue opportunities will be sufficient to attract significant private capital. Thus, the needed infrastructure would be both considerably more expensive and require diverse public resources. The end result would be substantial delays. Moreover, the number of vehicles contributing to mobile source pollution in major urban centers is not reduced, thus making compliance with air quality standards more difficult and potentially limiting future development. Simply stated, vertical construction in existing right-of-way over vast expanses is simply not economically rational or practical.



A Broader Perspective on Land Acquisition (cont.)

- Similar problems arise with horizontal expansion adjacent to existing major arteries. With projected needs of up to 24 lanes in some areas, the right-of-way would be prohibitively expensive and disruptive to many current high-value land uses (universities, major entertainment venues, commercial buildings, etc.). The costs would be prohibitive for private investors, and public resources would be severely constrained. Delays would be lengthy, and the number of vehicles in urban areas would not be reduced. Once again, such an option is not practical as the overall answer to mobility, environmental, and safety issues.
- The third alternative, to build on new locations, encompasses initiatives such as the TTC. Right-of-way can be acquired at much lower costs, and it is more feasible to create other revenue opportunities. Construction costs are also lower due to greater accessibility and less existing activity to accommodate. As a result, it becomes more viable to attract private capital and to accelerate development. At the same time, this strategy actually diverts substantial traffic (including trucks) from concentrated urban areas and enhances air quality and public safety.
- It should be further noted that an initiative such as the Trans-Texas Corridor creates synergies for further rail expansion (as well as other infrastructure requiring public right-of-way). By reducing land costs and construction outlays associated with building the rail bed, new trackage becomes more feasible. This added capacity can be crucial to meeting long-term transportation needs, improving mobility, and allowing Texas to be more competitive in domestic and international trade.
- Right-of-way acquisition is always a difficult part of infrastructure development. When viewed in the proper context of the existing logistics requirements of the state and the available alternatives, however, the TTC emerges as an innovative approach that has many advantages over other approaches.



CHANNELS OF ECONOMIC IMPACT



Channels of Economic Impact

- Enhancing Texas highway infrastructure brings about many benefits including decreased congestion and increased safety.

- In addition, the enhanced capacity will lead to substantial economic benefits. The four major channels of economic impact analyzed in this study include the effects of
 - construction and development,
 - increased efficiency,
 - improved intracorridor trade, and
 - economic development and expanded trade outside the corridor area.

- Even beyond the benefits measured herein, transportation system improvements can also have notable quality-of-life effects. Traffic congestion is an important factor in the perceived desirability of living in various areas, and enhancing Texas highway infrastructure will better position the state to attract firms with large concentrations of knowledge workers and other desirable forms of economic development.



Construction

■ TTC-35 Planned Construction Details through 2030 (road and rail projects):

- Near-Term Facilities:
 - Construction from 2006 to 2011
 - North Texas to San Antonio
 - Estimated Total Design and Construction Cost of \$9.81 billion
- Mid-Term Facilities:
 - Construction from 2011 to 2026
 - San Antonio / Austin Area Connectors
 - Estimated Total Design and Construction Cost of \$0.45 billion
- Long-Term Facilities:
 - Construction from 2026 to 2030
 - San Antonio to Rio Grande Valley; Fort Worth Connector
 - Estimated Total Design and Construction Cost of \$2.81 billion
- Estimated Total Projected Design and Construction Cost: \$13.07 billion

■ TTC-69 Planned Construction Details:

- The TTC-69 route will generally parallel the proposed Interstate 69 from Laredo/Corpus Christi to Texarkana.
- Currently, construction is projected to begin at some point prior to 2030.
- Building the 1,000-mile route is expected to involve total design and construction costs of \$21.53 billion (road only).

- These construction expenditures generate notable economic impacts, particularly given that most of the funds will be initially obtained from external private sources that would otherwise likely invest elsewhere and ultimately be repaid in an efficiency-enhancing manner.



Increased Efficiency

- By decreasing roadway delays, economic efficiency can be improved. Transportation logistics are enhanced across a broad spectrum of industries, allowing better inventory management, more efficient delivery schedules, lower transportation costs, and related benefits.
- Productivity can be increased when personnel, supplies, and finished products spend less time “stuck in traffic.”
- Traffic congestion delays are exacerbated by bottlenecks in the major urban areas around the proposed TTC-35 and TTC-69. The Trans-Texas Corridor will generate efficiency gains by bypassing the urban areas, thus eliminating much of the pass-through traffic that contributes to urban congestion and providing more overall capacity. Moreover, some of the traffic originating or terminating in urban areas will be diverted to portions of the corridor as the marginal benefit across the entire trip exceeds the marginal cost. As a result, increasing the efficiency of urban infrastructure leads to the enhanced economic output in these areas.
- The cost savings achieved through efficiency gains are typically reinvested in the economy. Such deployment of these additional resources is typically required to enhance shareholder value or profits. Depending on market conditions, this process may take the form of lower prices (which stimulate purchases) or direct purchase of additional resources. In either case, overall production is stimulated.
- It should also be noted that, since alternative routes (such as Interstate 35) will be available, trips will only occur in TTC-35 (and other corridors) to the extent that marginal benefit exceeds marginal cost. Thus, the tolls paid to recoup the initial investment will be based on an efficiency-enhancing decision. A portion of the amounts will be paid by out-of-state interests, while the remainder will be obtained from travelers based in Texas. In either instance, the choice of TTC-35 represents a net benefit, with the risk of inadequate revenues being assumed by private interest. As discussed subsequently, the efficiency calculations more than offset any costs associated with the in-state payment of tolls over time.



Trade Within the Trans-Texas Corridor

- Facilitating the flow of goods and people among the Trans-Texas Corridor communities will lead to greater trade within the region. Reduced travel time and costs within the trade area for consumers makes more resources available for local purchases. Moreover, reduced business costs and delivery times provide expanded opportunities for input purchases within the corridor.
- In essence, the development of local infrastructure provides a comparative advantage to suppliers in and around the corridor with respect to customers in the relevant region. Because there are no substantial production constraints over a long-term time horizon (and even short-term capacity utilization is only about 80%), such increases represent net gains in overall production.
- Capturing a greater proportion of intracorridor activity enhances the integration of the corridor and stimulates all aspects of economic activity (expenditures, output, income, employment, etc.) across a broad spectrum of industries. It also facilitates the creation of “clusters” of related sectors, which promotes overall development.
- In recent years, it has been widely recognized that successful growth initiatives are often centered around the formation of “clusters” of interrelated enterprises that support supplier networks, labor pools, and other integrated resources. Examples in Texas include electronics in Austin, telecommunications in Dallas, and petrochemicals in Houston. In particular, the State of Texas has organized much of its recent efforts around a major cluster initiative (see, for example, *Texas, Our Texas: An Assessment of Economic Development Programs and Prospects in the Lone Star State*, November 2002 by The Perryman Group and the Texas Workforce Commission's *Engines of The N. Texas Economy: The Texas Industry Cluster Initiative* report which was released in 2005). Such concentrations of activity are driven by cost and efficiency factors which are enhanced by infrastructure improvements.



Economic Development/External Trade

- The TTC will improve the competitive position of Texas in the national and international marketplace. Infrastructure to support economic growth is essential to achieving long-term prosperity, and the TTC represents a fundamental new concept that will enhance the position of Texas in both absolute and relative terms. Local firms will achieve a competitive advantage relative to competitors elsewhere, thus stimulating market share gains.
- By reducing the cost and time involved in transporting goods within and through the state and to markets beyond, the TTC can lead to substantial economic development in the Lone Star State. A similar stimulus results from the improved linkage to major external markets, such as Mexico and the northwestern US.
- The TTC also enhances the ability to manage inventories, logistics, and other key cost factors, thus improving the capacity to attract both additional activity for existing firms and new locations. These efficiency factors are becoming increasingly important in a globally competitive environment.



Offsets to the Economic Gains

- The construction and development of the TTC does involve some economic tradeoffs from
 - foregone construction and efficiency benefits from the State funds that are used for TTC construction, and
 - reduced agriculture production as land is removed from agricultural use and used for the roadway.

- TPG estimated the magnitude of these effects and incorporated them into this analysis of the net benefits of the Trans-Texas Corridor. The results indicate notable overall gains to the economy for the implementation of this initiative.

- It should be noted that some observers emphasize that transportation infrastructure is a necessary but not a sufficient condition for growth. While it is certainly true that new facilities such as TTC cannot force producers to increase activity, it does offer the kind of incentives that drive decisions in a competitive market context. Texas ranks at or near the top of the US in a wide variety of indicators of economic development potential and success (business climate, cost of doing business, etc.). Moreover, Texas maintains an aggressive economic development program that has recently been expanded to include the Texas Enterprise Fund, the Texas Emerging Technology Fund, and other major initiatives designed to support long-term success in both emerging high-growth industries and traditional sources of business activity. In other words, Texas achieves the requisite conditions for substantial future expansions, but will be constrained by capacity limits in the absence of infrastructure. Thus, while there is always uncertainty associated with future economic activities, the potential benefits of the TTC presented in this study may be properly viewed as gains for which the added infrastructure is a proximate cause. These benefits will be constrained in the absence of such efficiency gains and, given the other characteristics of the state with regard to growth potential, are likely to occur if they can be supported.



METHODS USED IN THIS ANALYSIS: A BRIEF SYNOPSIS



Methods Used in This Analysis: Impact Assessment System

- The basic modeling technique employed in assessing the economic impact of this initiative is known as dynamic input-output analysis. This methodology essentially uses extensive survey data, industry information, and a variety of corroborative source materials to create a matrix describing the various goods and services (known as resources or inputs) required to produce one unit (a dollar's worth) of output for a given sector. Once the base information is compiled, it can be mathematically simulated to generate evaluations of the magnitude of successive rounds of activity involved in the overall production process.
- There are two essential steps in conducting an input-output analysis once the system is operational. The first major endeavor is to accurately define the levels of direct activity to be evaluated. In this instance, the direct effects were estimated based on projected costs of the various segments of the TTC, as well as extensive analysis by TPG of the potential gains in efficiency, intracorridor trade, and external development. The second step is the simulation of the input-output system to measure overall economic effects.
- Once the direct input values were determined, the present study was conducted within the context of the Texas submodel of the US Multi-Regional Impact Assessment System (USMRIAS) which was developed and is maintained by The Perryman Group. This model has been used in hundreds of diverse applications across the country and has an excellent reputation for accuracy and credibility. In addition, the model has been in operation and continually updated for over two decades and is widely used by State and federal governmental entities. The system used in the current simulations reflects the unique industrial structure of the Texas economy, as well as specific submodels developed for the TTC-35 and TTC-69 corridors.
- The only segments for which these systems were fully implemented were those aspects of the analysis (such as construction, intracorridor trade, and foregone agricultural production) for which "multiplier" effects are appropriate.
- A fiscal impact system within these models is also used to evaluate potential revenues to state and local governments.



Methods Used in This Analysis: Texas Econometric Model

- In order to evaluate overall baseline growth (without the infrastructure investment) in the regional and state economies and to provide context for the proposed development, TPG prepared long-term forecasts of state and regional business activity using the Texas Econometric Model.
- This system, which was developed and has been maintained by TPG for the past 25 years, is designed to project detailed industrial patterns on a state, regional, and local basis. It also allows simulations of performance under alternative economic conditions.
- The model revolves around the simultaneous determination of income (real and nominal), output (real and nominal), and employment by production category, but also projects a variety of additional information (retail sales, population, and other variables). It is designed to allow a wide variety of factors to interact in preparing projections and simulations. It is also stimulated to permit numerous external factors to influence overall projected performance.
- For this analysis, detailed submodels were developed and implemented for the TTC-35 and TTC-69 study areas. Moreover, simulations were prepared over 25 and 50-year timeframes to illustrate the impacts on various corridors of the TTC initiative relative to baseline or “no build” conditions.



Methods Used in the Analysis: Additional Calculations

- Efficiency gains and losses associated with the Trans-Texas Corridor are measured using a model developed by the US Department of Transportation. The system was fully updated and localized to Texas and the TTC-35 and TTC-69 study areas. It was also expanded to incorporate some aspects of direct consumer spending, and adjusted to reflect the nature of TTC facilities and the alternatives likely to have been funded by State revenues. As described in more detail in the accompanying *Technical Analysis*, the approach was structured in a manner which is likely designed to modestly understate the potential benefits (net of in-state tolls). The results of this segment of the investigation were also found to be consistent with those in a "travel time" study performed by Wilbur Smith Associates.
- Gains in intracorridor trade are measured based on the net value of potential trade in each corridor. Calculations are performed to measure both (1) the current and projected demand for domestic production by detailed industrial sector within each area and (2) the corresponding supply capabilities. The interaction of these phenomena define the capacity for trade within the relevant corridor. It was then assumed that the infrastructure enhancement would lead to a 1% increase in internal "value capture" within the impacted region (as a percentage of the total amount available to local producers). As described in the *Technical Analysis*, this amount produces results which suggest it is well below historical experience for significant investments in major transportation routes. The detailed projections from the Texas Econometric Model and its TTC-35 and TTC-69 study area submodels were used in these calculations, as were extensive regional databases from the US Department of Commerce. Computations were allocated across industrial categories based on the Texas Multi-Regional Impact Assessment System, then simulated to measure aggregate effects. The effects were assumed to be realized over a five-year period following the completion of each segment. Given the current pace of the economy in incorporating and responding to changes in technology and other factors, this transition is likely to underestimate overall benefits and appropriately adjust for the dynamic nature of economic effects over time.



Methods Used in the Analysis: Additional Calculations (cont.)

- Gains in economic development and external trade were implemented through the achievement of a 1% additional share of national output over a 25-year period, with appropriate percentages by sector allocated to each corridor. This amount is much less than that observed with other major infrastructure projects (as indicated by the measured effects relative to the interstate highway system) and is well within the bounds of “high growth” forecast simulations and historical performance. The amounts are allocated on a detailed sectoral basis using the allocation mechanisms within the Texas Multi-Regional Impact Assessment System and the baseline growth projections within the Texas Econometric Model. The impact system is simulated to calculate variables other than gross product (expenditures, employment, and income), but no “multiplier” effects are added. It is assumed that the appropriate level of stimulus is realized over a 10-year period following the implementation of each corridor segment. Given the current pace of the economy in implementing and responding to changing technology and other factors, this transition period is likely to underestimate overall benefits.
- The assumptions used in the above analysis obviously involved some degree of uncertainty. Their reasonableness in light of other available information on historical and projected future patterns and prior investments is examined in the *Technical Analysis*. Moreover, a sensitivity analysis, using a lower level of internal and external stimulus, is provided subsequently in this report.

A more detailed discussion of methodology is given in the *Technical Analysis* which accompanies this report.



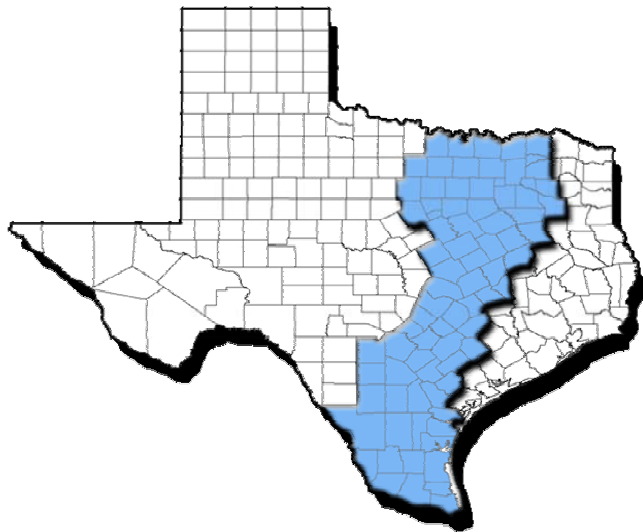
RESULTS OF THE IMPACT ANALYSIS



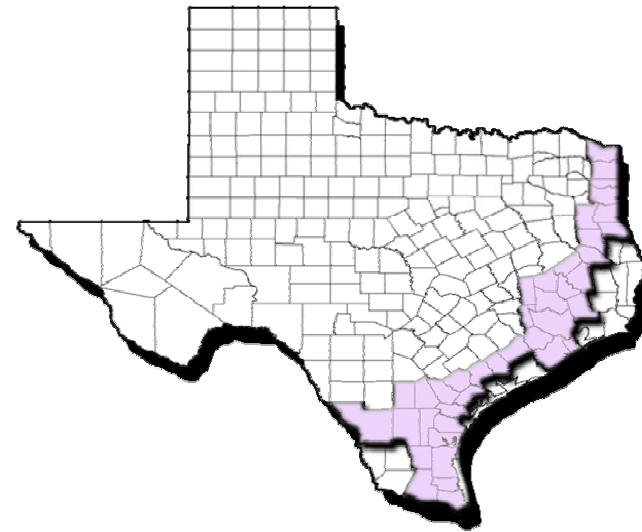
The TTC-35 & TTC-69 Study Areas

- The TTC-35 and TTC-69 study areas are a group of counties defined by the Texas Department of Transportation as proximate to the proposed TTCs. While only a miniscule fraction of the land area in the region will actually be utilized, the study areas are those counties which will be most directly impacted by construction activity, efficiency gains, and economic development effects.

TTC-35 Study Area



TTC-69 Study Area





The TTC-35 Study Area

- The TTC-35 Study Area includes the following counties

Anderson	Duval	Jim Hogg	Nueces
Atascosa	Ellis	Jim Wells	Palo Pinto
Bastrop	Erath	Johnson	Parker
Bee	Falls	Karnes	Rains
Bell	Fannin	Kaufman	Robertson
Bexar	Fayette	Kenedy	Rockwall
Bosque	Freestone	Kleberg	San Patricio
Brazos	Frio	La Salle	Smith
Brooks	Goliad	Lamar	Somervell
Burleson	Gonzales	Lavaca	Starr
Caldwell	Grayson	Lee	Tarrant
Cameron	Guadalupe	Leon	Travis
Collin	Hays	Limestone	Van Zandt
Comal	Henderson	Live Oak	Webb
Cooke	Hidalgo	McLennan	Willacy
Coryell	Hill	McMullen	Williamson
Dallas	Hood	Medina	Wilson
DeWitt	Hopkins	Milam	Wise
Delta	Hunt	Montague	Wood
Denton	Jack	Navarro	Zapata



The TTC-69 Study Area

■ The TTC-69 Study Area includes the following counties

Angelina	Hidalgo	Refugio
Bee	Jackson	Rusk
Bowie	Jim Wells	San Jacinto
Brazoria	Kenedy	San Patricio
Brooks	Kleberg	Shelby
Cameron	Liberty	Trinity
Cass	Live Oak	Victoria
Duval	Marion	Walker
Fort Bend	McMullen	Waller
Galveston	Montgomery	Webb
Goliad	Nacadoches	Wharton
Grimes	Nueces	Willacy
Harris	Panola	
Harrison	Polk	



Results of the Impact Analysis: Key Findings

- The construction and development of the Trans-Texas Corridor stands to fundamentally shift the Texas economy into a more competitive position. Because of the unique and innovative return nature of this concept and its capacity to substantially impact mobility in Texas relative to other areas, the resulting gains in expenditures, output, income, and employment are quite notable.
- Construction and development of TTC-35 leads to cumulative incremental business activity over a 25-year period of more than \$1.4 trillion (in constant 2005 dollars) in gross state product (almost \$850 billion on a net present value basis) and 14.8 million person-years of employment. These numbers, which are derived under very conservative assumptions, tend to escalate over time.
- Construction and development of TTC-69 which occurs later than TTC-35, nonetheless engenders substantial economic gains of an estimated \$780 billion (in constant 2005 dollars) in cumulative gross product (more than \$325 billion on a net present value basis) and 6.2 million person-years of employment through 2040. Its contribution to business activity escalates materially beyond that point.
- The total conceptual TTC plan (including the longer-term development of other corridors, rail infrastructure, and other projects) would contribute *annual* gains of \$1.65 trillion in expenditures, \$665.9 billion in gross state product, \$376.4 billion in personal income, and 3.7 million permanent jobs (all monetary values are given in constant 2005 dollars).
- Clearly, the infrastructure enhancement represented by the TTC would work to stimulate the economic prosperity of Texans for generations to come.



Description of the Impact Results

- TPG measured the effect of construction and development of TTC-35 utilizing several measures of business activity including
 - total expenditures,
 - gross product,
 - personal income, and
 - employment.

These concepts are defined in the Appendix.

- For each measure, the gains stemming from construction and implementation (gains in efficiency, intracorridor trade, and economic development/external trade) are presented, as are the offsets arising from other foregone benefits from other construction projects (with the corresponding losses in efficiency) and the reduction in agricultural production.
- Monetary values are given in constant 2005 dollars. In areas where the net present value (NPV) is presented, a real (inflation-adjusted) rate of 3% is employed. Given expected patterns in future inflation, this rate represents about 6% in nominal terms, which is well above the current rate for long-term revenue bonds issued by the State of Texas. The effects of alternative discount rates are explored subsequently in this report.
- In the following sections, the impact on these measures is described for
 - TTC-35,
 - TTC-69,
 - other priority corridors, and
 - other elements of the TTC conceptual plan as well as the plan in its entirety.

More detailed empirical results and extensive tables are provided in the *Technical Analysis* which accompanies this report.



Results of the Impact Analysis: TTC-35

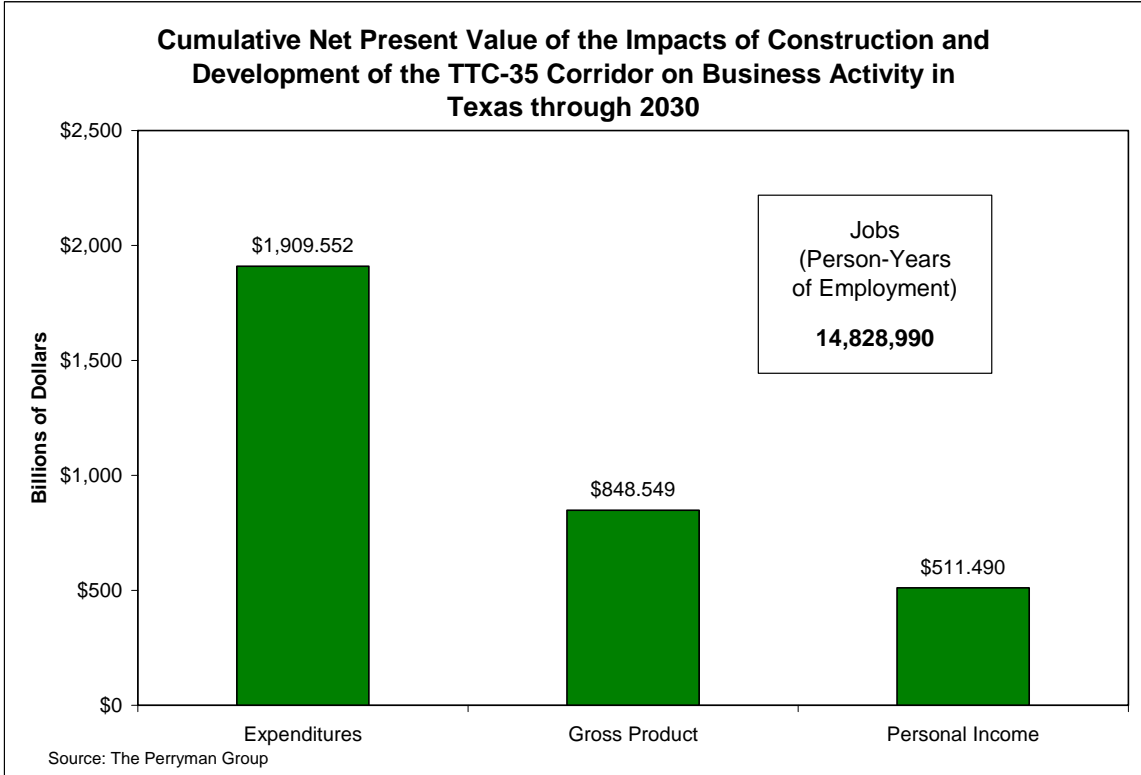


TTC-35 Construction and Development Effects



Impact of Construction and Development of TTC-35

- Through 2030, the cumulative effect of construction and development of TTC-35 involves gains for the TTC-35 Study Area, including some \$1.91 trillion (in constant 2005 dollars on a net present value basis) in expenditures and 14.8 million person-years of employment.





Impact of Construction and Implementation of TTC-35: Expenditures

- Through 2030, TTC-35 generates trillions of dollars in incremental expenditures in the state.

Total Cumulative Texas Expenditures Gains and Offsets Stemming from Construction and Development of the TTC-35 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2010	Through 2020	Through 2030	Through 2055
Construction	\$13.724	\$35.776	\$45.512	\$45.512
Efficiency Benefits	\$0.474	\$26.872	\$63.764	\$181.628
IntraCorridor Trade	\$0.697	\$193.993	\$683.538	\$3,304.507
Economic Dev./External Trade	\$1.435	\$482.098	\$2,435.720	\$13,051.448
Construction Offsets	(\$1.354)	(\$3.529)	(\$4.489)	(\$4.489)
Efficiency Offsets	(\$0.034)	(\$1.948)	(\$4.621)	(\$13.163)
Agriculture Offsets	(\$0.128)	(\$0.887)	(\$1.765)	(\$4.222)
TOTAL NET BENEFITS	\$14.814	\$732.376	\$3,217.660	\$16,561.221
NET PRESENT VALUE	\$13.458	\$524.354	\$1,909.552	\$6,264.888



Impact of Construction and Implementation of TTC-35: Gross Product

- Cumulative incremental gross product by 2030 totals more than \$1.4 trillion (in constant 2005 dollars).

Total Cumulative Texas Gross Product Gains and Offsets Stemming from Construction and Development of the TTC-35 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2010	Through 2020	Through 2030	Through 2055
Construction	\$6.320	\$16.520	\$20.979	\$20.979
Efficiency Benefits	\$0.222	\$12.582	\$29.860	\$85.179
IntraCorridor Trade	\$0.331	\$92.085	\$324.463	\$1,568.589
Economic Dev./External Trade	\$0.624	\$209.501	\$1,058.472	\$5,671.665
Construction Offsets	(\$0.625)	(\$1.629)	(\$2.069)	(\$2.069)
Efficiency Offsets	(\$0.016)	(\$0.918)	(\$2.170)	(\$6.180)
Agriculture Offsets	(\$0.046)	(\$0.322)	(\$0.641)	(\$1.534)
TOTAL NET BENEFITS	\$6.808	\$327.818	\$1,428.893	\$7,336.628
NET PRESENT VALUE	\$6.186	\$234.820	\$848.549	\$2,777.026



Impact of Construction and Implementation of TTC-35: Personal Income

- Incremental cumulative personal income through 2030 is estimated to exceed \$859 billion (in constant 2005 dollars).

Total Cumulative Texas Personal Income Gains and Offsets Stemming from Construction and Development of the TTC-35 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2010	Through 2020	Through 2030	Through 2055
Construction	\$4.265	\$11.154	\$14.160	\$14.160
Efficiency Benefits	\$0.149	\$8.443	\$20.036	\$57.117
IntraCorridor Trade	\$0.197	\$54.882	\$188.743	\$887.638
Economic Dev./External Trade	\$0.385	\$129.712	\$639.460	\$3,318.331
Construction Offsets	(\$0.422)	(\$1.100)	(\$1.397)	(\$1.397)
Efficiency Offsets	(\$0.011)	(\$0.612)	(\$1.452)	(\$4.139)
Agriculture Offsets	(\$0.029)	(\$0.199)	(\$0.397)	(\$0.949)
TOTAL NET BENEFITS	\$4.534	\$202.280	\$859.153	\$4,270.759
NET PRESENT VALUE	\$4.121	\$145.045	\$511.490	\$1,628.439



Impact of Construction and Implementation of TTC-35: Employment

- Through 2030, TTC-35 generates an estimated net gain of 14.8 million person-years of employment. (Note that these values are cumulative person-years over the relevant time frames and do not reflect employment in any single year.)

Total Cumulative Texas Employment Gains and Offsets Stemming from Construction and Development of the TTC-35 Corridor through 2055				
	Through 2010	Through 2020	Through 2030	Through 2055
Construction	84,212	220,243	279,525	279,525
Efficiency Benefits	3,732	211,776	502,602	1,433,674
IntraCorridor Trade	5,926	1,402,994	4,409,565	16,869,997
Economic Dev./External Trade	7,680	2,181,521	9,709,265	41,343,359
Construction Offsets	(8,337)	(21,722)	(27,569)	(27,569)
Efficiency Offsets	(270)	(15,348)	(36,425)	(103,903)
Agriculture Offsets	(576)	(4,006)	(7,973)	(19,076)
TOTAL NET BENEFITS	92,365	3,975,458	14,828,990	59,776,007

*Person-Years



Timing of TTC-35 Gross Construction Impacts

- Segments designated as short-term projects generate the bulk of projected gross construction gains.

Gross Impact of Construction of TTC-35 on the TTC Study Area and Texas through 2030				
	Gross Product (Billions of 2005\$)		Employment (Person-Years)	
	TTC Study Area	Texas	TTC Study Area	Texas
Short-Term Projects* (2006 through 2011)	\$15.219	\$15.806	205,436	210,750
Mid-Term Projects** (2011 through 2026)	\$0.687	\$0.714	9,249	9,494
Long-Term Projects*** (2026 through 2030)	\$4.289	\$4.459	57,753	59,282
TOTAL	\$20.194	\$20.979	272,438	279,525

* Short-term projects include the Dallas South-East Connector, Georgetown to Temple to Dallas segments, the Dallas North-East Connector, San Antonio Southeast Loop, Austin area to Seguin, and Relocation of the Union Pacific Railroad.

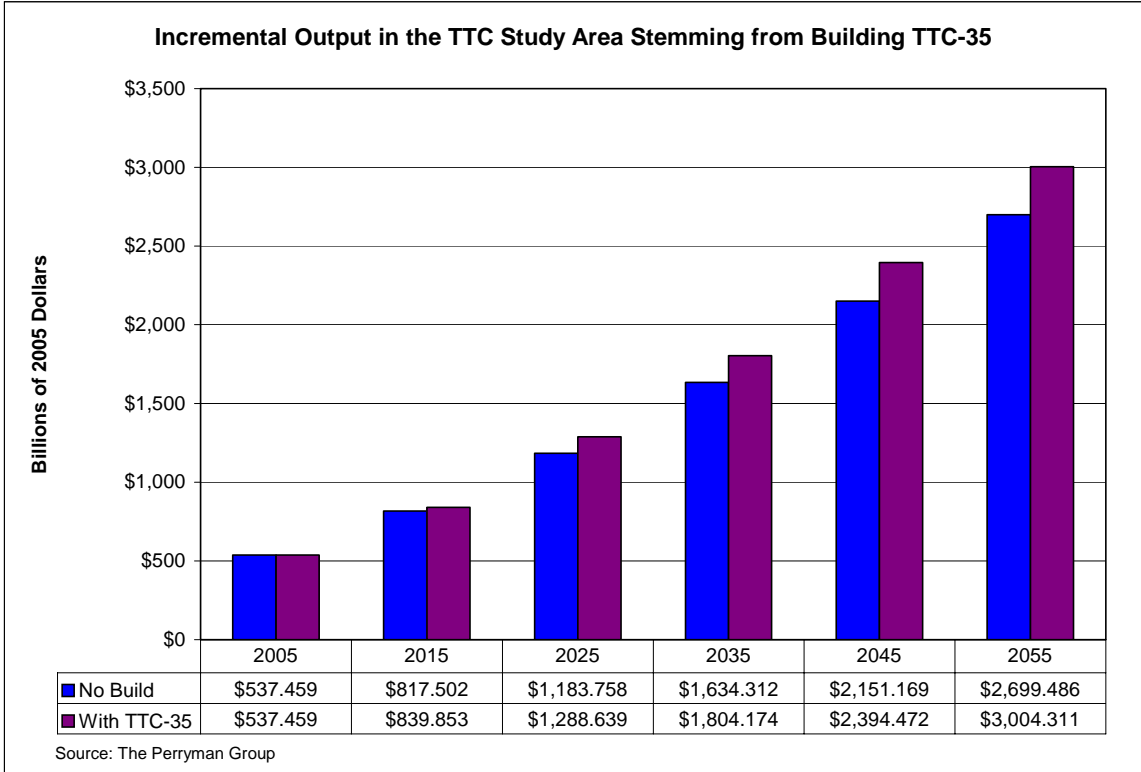
** Mid-term projects include segments from San Antonio to Seguin and Georgetown through Austin area.

*** Long-term projects include the Fort Worth Connector and segments from San Antonio to the Rio Grande Valley.



Incremental Output Compared to a “No Build” Scenario: TTC-35 Study Area

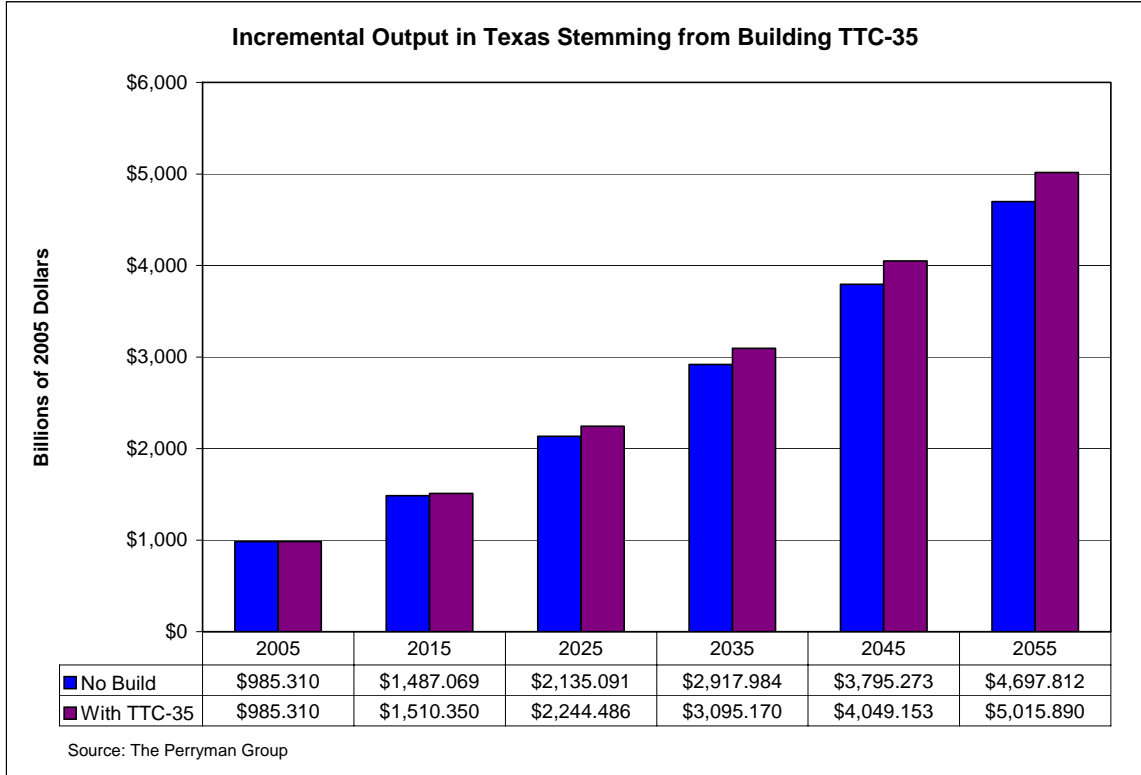
- For the TTC Study Area, annual output (in constant 2005 dollars) is expected to increase by more than \$300 billion by 2055 with TTC-35 in place.





Incremental Output Compared to a “No Build” Scenario: Texas

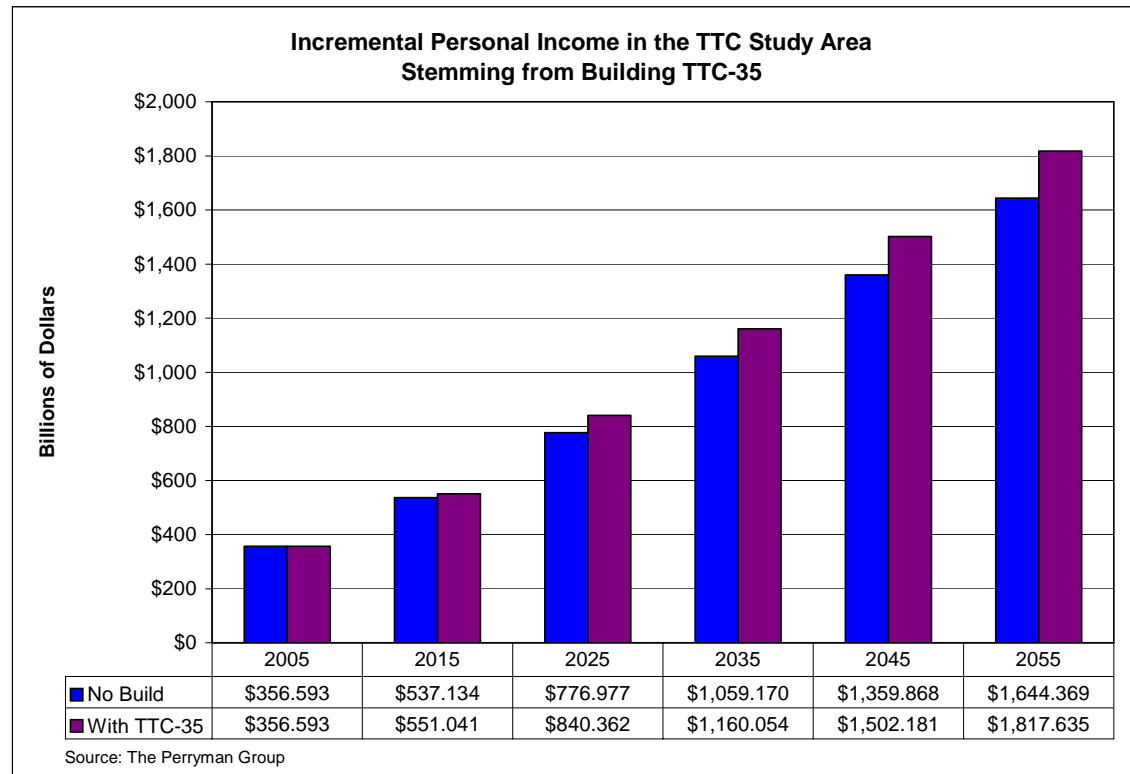
- The implementation of TTC-35 generates anticipated gains in output (Gross State Product) that are notable even given the size of the Texas economy. Nonetheless, these gains are well below those experienced from other major infrastructure projects and are reasonable by several other objective criterion (see *Technical Analysis* for additional discussion).





Incremental Personal Income Compared to a “No Build” Scenario: TTC-35 Study Area

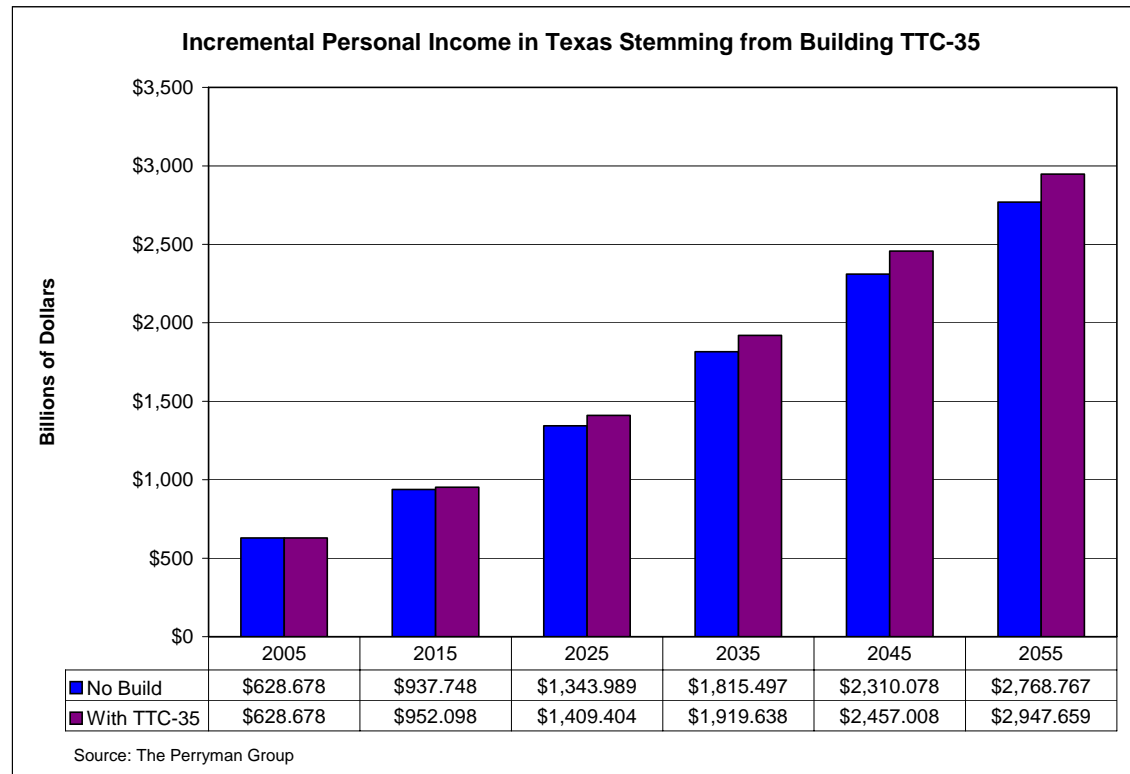
- Implementing TTC-35 leads to expected gains in annual personal income within the study area of more than \$170 billion by 2055 relative to the “No Build” scenario.





Incremental Personal Income Compared to a “No Build” Scenario: Texas

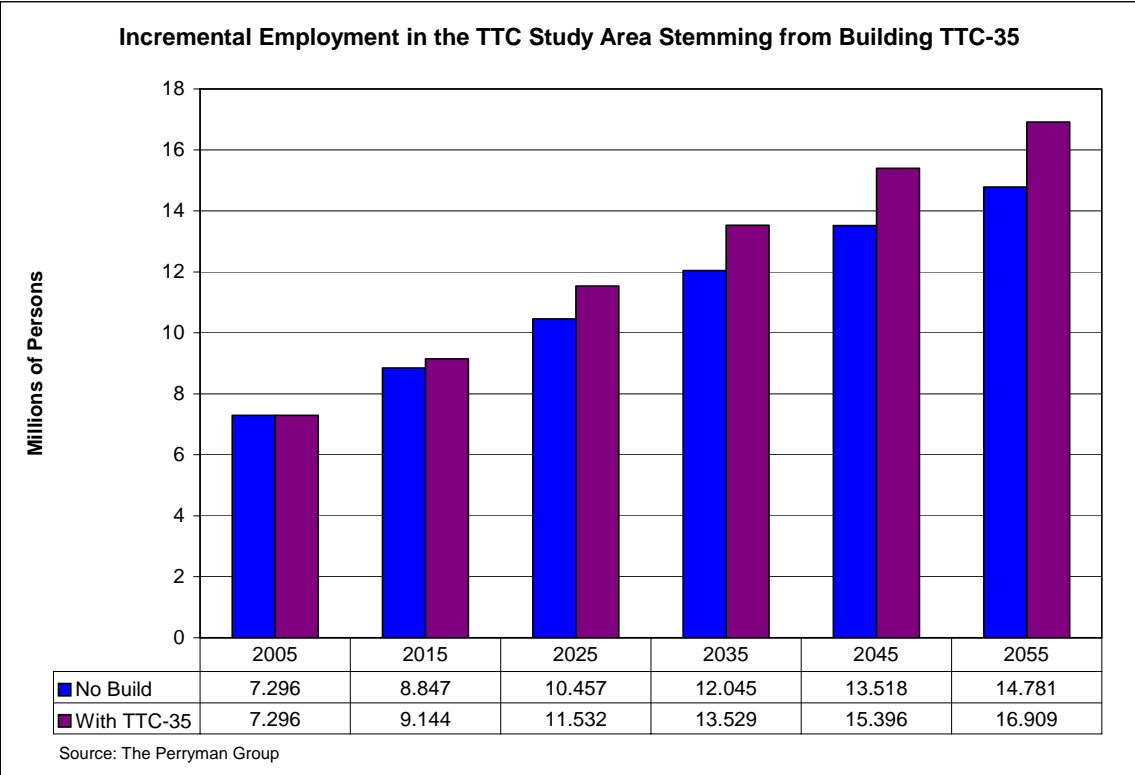
- Personal income in Texas would be significantly higher with the implementation of TTC-35.





Incremental Employment Compared to a “No Build” Scenario: TTC-35 Study Area

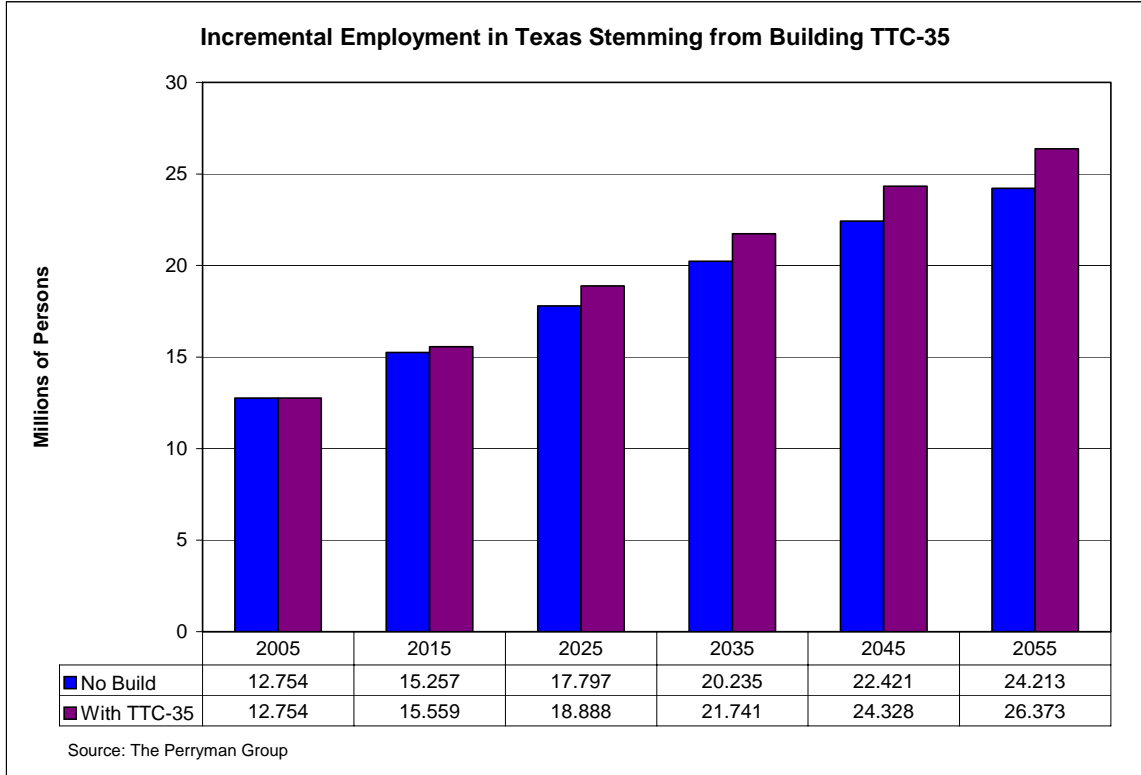
- Approximately 1.5 million additional jobs could be expected to be generated within the TTC Study Area by 2035.





Incremental Employment Compared to a “No Build” Scenario: Texas

- TTC-35 generates projected incremental employment of millions of additional persons in the state in the decades to come.





TTC-35 Sensitivity Analysis



TTC-35 Sensitivity Analysis: State Funding

- If the unique financing mechanisms implicit in the TTC analysis were not available and the private component was replaced by State fiscal resources, significant delays in corridor development could be expected. For purposes of this analysis, TPG assumed a 10-year delay (it would likely be much longer). In addition, offsets for other construction activity foregone increase as additional funds are channeled into TTC projects.

Cumulative Effects through 2055 of Utilizing 100% State Financing for TTC-35 Construction			
	Baseline NPV* Total	100% State Financing NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$4.42 trillion	(\$1.85 trillion)
Gross Product	\$2.78 trillion	\$1.96 trillion	(\$820 billion)
Personal Income	\$1.63 trillion	\$1.16 trillion	(\$470 billion)
Employment	59,776,007 Person-Years	43,424,057 Person-Years	(16,351,951) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: 100% Private Displacement of Currently Anticipated State Funds

- In this scenario, TPG examined the effects if the State contributions to TTC-35 could be completely replaced by private funding. The result is that the foregone construction and efficiency benefits are restored, thus resulting in a modest net benefit. Such a pattern could only occur if the economic returns to private investors were to increase to a level that would justify the additional outlays.

TTC-35 Cumulative Effects through 2055 of 100% Private Displacement of Currently Anticipated State Funds			
	Baseline NPV* Total	100% Private Displacement of State Funds NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$6.27 trillion	\$9 billion
Gross Product	\$2.78 trillion	\$2.78 trillion	\$4 billion
Personal Income	\$1.63 trillion	\$1.63 trillion	\$3 billion
Employment	59,776,007 Person-Years	59,907,480 Person-Years	131,472 Person Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: 50% Private Displacement of Currently Anticipated State Funds

- While complete displacement of state funds is unlikely, some additional investor funding might become available if additional sources of potential private sector earnings could be identified (or the risk associated with current earnings could be reduced). In the current scenario, TPG considers an intermediate case in which 50% of the currently anticipated State funds are replaced. The resulting ability to deploy these funds to other needed projects reduces the offsets for construction and efficiency to some extent, thus fostering a moderate stimulus.

TTC-35 Cumulative Effects through 2055 of 50% Private Displacement of Currently Anticipated State Funds			
	Baseline NPV* Total	50% Private Displacement of State Funds NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$6.27 trillion	\$4.7 billion
Gross Product	\$2.78 trillion	\$2.78 trillion	\$2.2 billion
Personal Income	\$1.63 trillion	\$1.63 trillion	\$1.5 billion
Employment	59,667,007 Person-Years	59,841,744 Person-Years	65,736 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorporate trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Increase in Enhanced Efficiency

- In this scenario, TPG assumed gains in efficiency of 5% greater than those in the baseline projections. Such an outcome would increase the direct efficiency of various sectors, as well as the propensity for increased intracorridor trade.

TTC-35 Cumulative Effects of a 5% Increase in Enhanced Efficiency through 2055			
	Baseline NPV* Total	Enhanced Efficiency Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$6.58 trillion	\$312 billion
Gross Product	\$2.78 trillion	\$2.92 trillion	\$138 billion
Personal Income	\$1.63 trillion	\$1.71 trillion	\$81 billion
Employment	59,776,007 Person-Years	62,758,359 Person-Years	2,982,352 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Decrease in Enhanced Efficiency

- This scenario assumes that the efficiency gains are 5% less than those anticipated in the baseline projections. This lower level of increase reduces the efficiency improvements across various sectors and decreases the magnitude of the stimulus to intracorridor trade.

TTC-35 Cumulative Effects of a 5% Decrease in Enhanced Efficiency through 2055			
	Baseline NPV* Total	Reduced Efficiency Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$5.95 trillion	(\$312 billion)
Gross Product	\$2.78 trillion	\$2.64 trillion	(\$138 billion)
Personal Income	\$1.63 trillion	\$1.55 trillion	(\$81 billion)
Employment	59,776,007 Person-Years	56,793,656 Person-Years	(2,982,352) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: More Rapid Population Growth

- This scenario examines the net change assuming a migration rate to the state equal to that experienced over the 1990-2000 timeframe; this rate is somewhat higher than current estimates of future in-migration (66.58% of the level in the 1990s under baseline conditions). Greater population growth enhances the need for the various projects and stimulates additional intracorridor trade.

TTC-35 Cumulative Effects of More Rapid Population Growth through 2055 (100% of 1990-2000 Migration Level)			
	Baseline NPV* Total	More Rapid Population Growth Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$6.52 trillion	\$255 billion
Gross Product	\$2.78 trillion	\$2.90 trillion	\$120 billion
Personal Income	\$1.63 trillion	\$1.70 trillion	\$68 billion
Employment	59,776,007 Person-Years	63,304,356 Person-Years	3,528,348 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Slower Population Growth

- In this scenario, TPG examines the consequences of somewhat lower population growth. In particular, it is assumed that migration to Texas occurred at a rate of only 50% of the 1990-2000 level (vs. 66.58% in the Baseline case). Lower population growth reduces the opportunities to expand intracorridor trade.

TTC-35 Cumulative Effects of Slower Population Growth through 2055 (50% of 1990-2000 Migration Level)			
	Baseline NPV* Total	Slower Population Growth Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$6.14 trillion	(\$127 billion)
Gross Product	\$2.78 trillion	\$2.72 trillion	(\$60 billion)
Personal Income	\$1.63 trillion	\$1.59 trillion	(\$34 billion)
Employment	59,776,007 Person-Years	58,011,808 Person-Years	(1,764,199) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Lower Level of Intracorridor Trade and External Trade/Economic Development

- As noted earlier, the assumptions regarding intracorridor trade and external trade/economic development are based on reasonable and conservative premises and produce impacts which are consistent with expectations based on past experience and other indicia (see the *Technical Analysis* for a more extensive discussion). Nonetheless, future outcomes are subject to significant uncertainty and ultimate outcomes could be substantially different in either direction. This scenario illustrates the consequences of achieving only 50% of the levels of internal and external “value capture” reflected in the Baseline case.

TTC-35 Cumulative Effects of a Lower “Value Capture” on Internal and External Activity (50% of Baseline Level)			
	Baseline NPV* Total	Lower “Value Capture” Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$3.19 trillion	(\$3.08 trillion)
Gross Product	\$2.78 trillion	\$1.41 trillion	(\$1.37 trillion)
Personal Income	\$1.63 trillion	\$830 billion	(\$798 billion)
Employment	59,667,007 Person-Years	30,669,330 Person-Years	(29,106,678) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Lower Real Discount Rate

- The baseline projections are presented using a 3% real (inflation-adjusted) discount rate. This rate is indicative of a nominal rate which is above the current financing rates for revenue bonds of comparable type and maturity. Market conditions, inflation, and other factors can impact the ultimate level of risk associated with the initiative. This scenario examines the consequences for long-term returns of using a lower, 2% real discount rate.

TTC-35 Cumulative Effects of Using a Lower Real (Inflation-Adjusted) Discount Rate (2%) through 2055			
	Baseline NPV* Total	2% Discount Rate Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$8.54 trillion	\$2.27 trillion
Gross Product	\$2.78 trillion	\$3.78 trillion	\$1.01 trillion
Personal Income	\$1.63 trillion	\$2.21 trillion	\$584 billion
Employment	59,776,007 Person-Years	59,776,007 Person-Years	0 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-35 Sensitivity Analysis: Higher Real Discount Rate

- This scenario examines the consequences for long-term effects if risk is increased, as reflected in a real (inflation-adjusted) discount rate of 4% (relative to a 3% baseline rate).

TTC-35 Cumulative Effects of Using a Higher Real (Inflation-Adjusted) Discount Rate (4%) through 2055			
	Baseline NPV* Total	4% Discount Rate Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$6.26 trillion	\$4.67 trillion	(\$1.60 trillion)
Gross Product	\$2.78 trillion	\$2.07 trillion	(\$708 billion)
Personal Income	\$1.63 trillion	\$1.22 trillion	(\$412 billion)
Employment	59,776,007 Person-Years	59,776,007 Person-Years	0 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



Results of the Impact Analysis: TTC-69

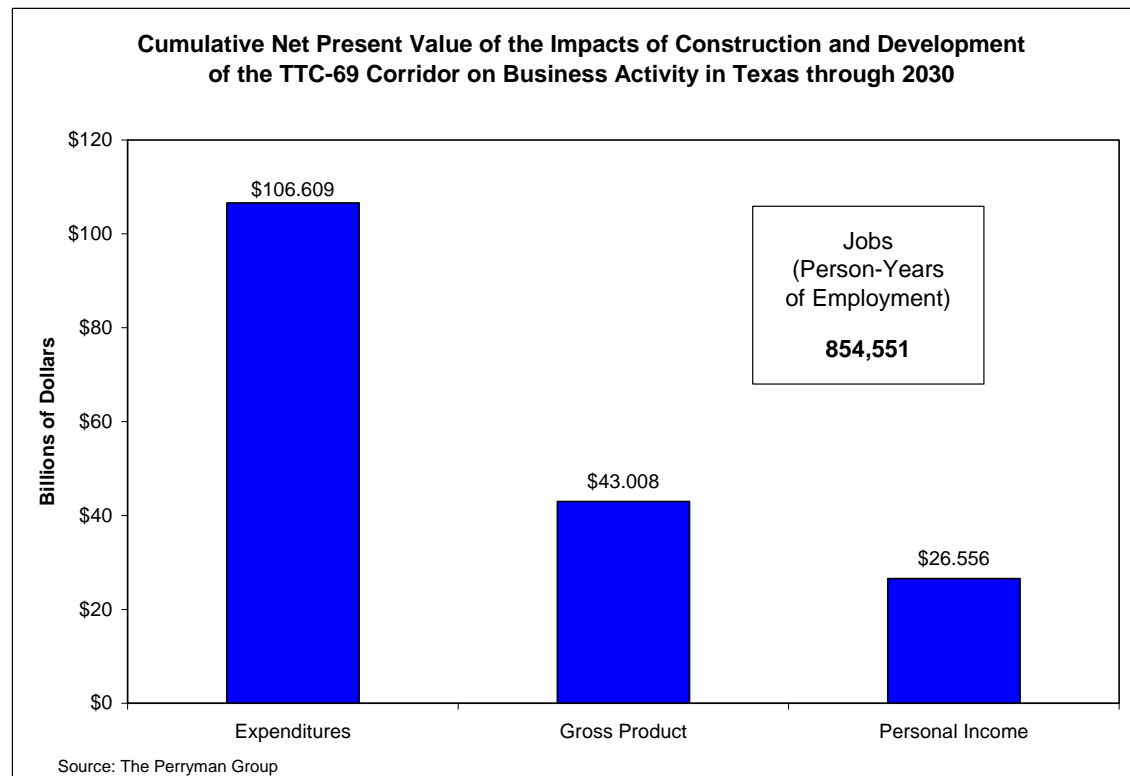


TTC-69 Construction and Development Effects



Impact of Construction and Development of TTC-69

- Construction of TTC-69 is currently scheduled to begin at some point prior to 2030; the corridor will lead to the addition of trillions of dollars in economic activity. Because the exact schedule and segments are not known, TPG assumed that (1) construction (road only) would begin in 2021 and continue through 2035, and (2) segments would be completed and begin to generate various types of non-construction benefits in 3 equal phases at five-year investments (2026, 2031, and 2036). Alternative patterns would affect the timing of the reported impact. Obviously, much of the benefit from this initiative occurs after 2030.





Impact of Construction and Implementation of TTC-69: Expenditures

- Through 2055, construction and development of TTC-69 leads to cumulative net gains in expenditures of more than \$8.3 trillion (in constant 2005 dollars). On a net present value basis, the cumulative outlays exceed \$2.6 trillion.

Total Cumulative Texas Expenditures Gains and Offsets Stemming from Construction and Development of the TTC-69 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2030	Through 2040	Through 2050	Through 2055
Construction	\$50.153	\$75.230	\$75.230	\$75.230
Efficiency Benefits	\$13.224	\$79.341	\$158.682	\$198.353
IntraCorridor Trade	\$39.299	\$381.316	\$990.564	\$1,343.465
Economic Dev./External Trade	\$108.318	\$1,554.051	\$4,809.028	\$6,754.382
Construction Offsets	(\$4.947)	(\$7.420)	(\$7.420)	(\$7.420)
Efficiency Offsets	(\$0.958)	(\$5.750)	(\$11.500)	(\$14.375)
Agriculture Offsets	(\$1.373)	(\$2.746)	(\$4.119)	(\$4.805)
TOTAL NET BENEFITS	\$203.716	\$2,074.022	\$6,010.465	\$8,344.829
NET PRESENT VALUE	\$106.609	\$865.801	\$2,085.045	\$2,666.817



Impact of Construction and Implementation of TTC-69: Gross Product

- In terms of gross product, cumulative gains stemming from TTC-69 are estimated to total almost \$3.1 trillion (in constant 2005 dollars) through 2055 (almost \$1 trillion on a net present value basis).

Total Cumulative Texas Gross Product Gains and Offsets Stemming from Construction and Development of the TTC-69 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2030	Through 2040	Through 2050	Through 2055
Construction	\$23.054	\$34.581	\$34.581	\$34.581
Efficiency Benefits	\$6.253	\$37.518	\$75.036	\$93.794
IntraCorridor Trade	\$18.374	\$178.279	\$463.124	\$628.117
Economic Dev./External Trade	\$37.443	\$537.198	\$1,662.364	\$2,334.825
Construction Offsets	(\$2.274)	(\$3.411)	(\$3.411)	(\$3.411)
Efficiency Offsets	(\$0.453)	(\$2.719)	(\$5.438)	(\$6.798)
Agriculture Offsets	(\$0.499)	(\$0.997)	(\$1.496)	(\$1.745)
TOTAL NET BENEFITS	\$81.898	\$780.448	\$2,224.760	\$3,079.364
NET PRESENT VALUE	\$43.008	\$326.799	\$774.238	\$987.224



Impact of Construction and Implementation of TTC-69: Personal Income

- TTC-69 construction and development lead to an estimated \$1.8 trillion (in constant 2005 dollars) cumulative increment to personal income in Texas through 2055.

Total Cumulative Texas Personal Income Gains and Offsets Stemming from Construction and Development of the TTC-69 Corridor through 2055 (in Billions of 2005 Dollars)				
	Through 2030	Through 2040	Through 2050	Through 2055
Construction	\$15.559	\$23.338	\$23.338	\$23.338
Efficiency Benefits	\$4.177	\$25.063	\$50.126	\$62.657
IntraCorridor Trade	\$10.945	\$105.693	\$272.562	\$367.971
Economic Dev./External Trade	\$21.904	\$312.643	\$959.837	\$1,341.713
Construction Offsets	(\$1.535)	(\$2.302)	(\$2.302)	(\$2.302)
Efficiency Offsets	(\$0.303)	(\$1.816)	(\$3.633)	(\$4.541)
Agriculture Offsets	(\$0.309)	(\$0.617)	(\$0.926)	(\$1.080)
TOTAL NET BENEFITS	\$50.440	\$462.002	\$1,299.003	\$1,787.757
NET PRESENT VALUE	\$26.556	\$193.849	\$453.249	\$575.072



Impact of Construction and Implementation of TTC-69: Employment

- Through 2055, construction and development of TTC-69 generates an estimated 20.4 million person-years of employment in the state.

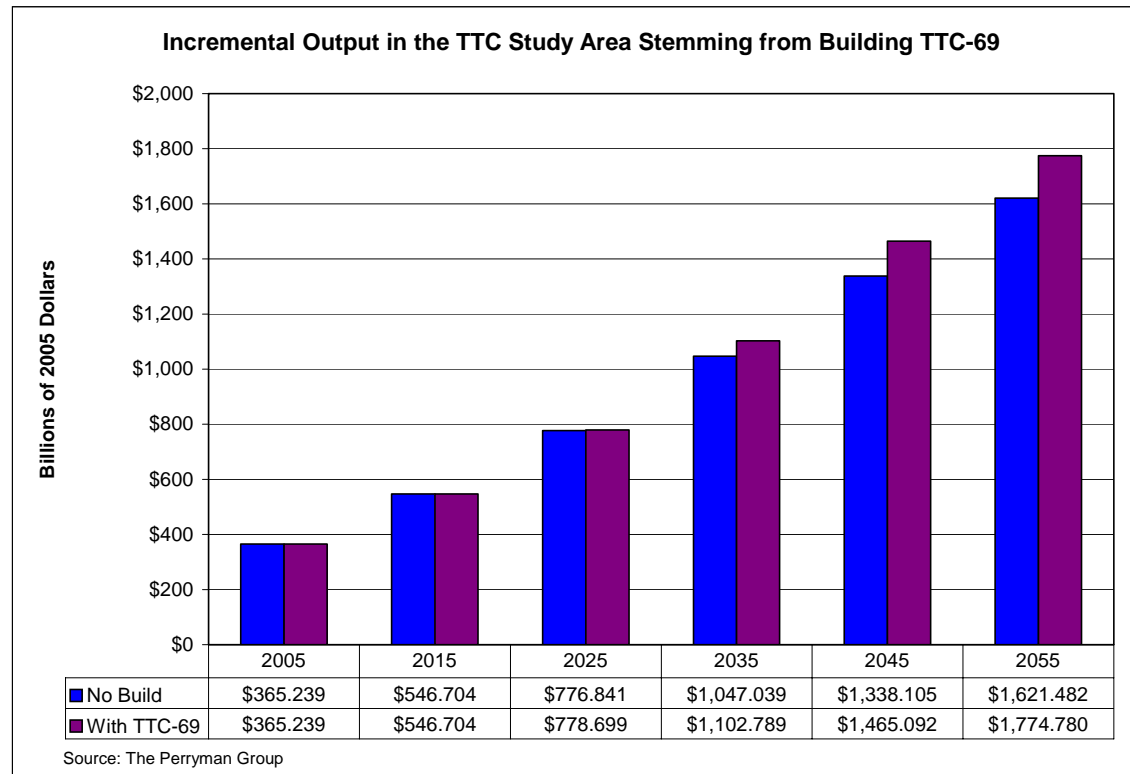
Total Cumulative Texas Employment Gains and Offsets Stemming from Construction and Development of the TTC-69 Corridor through 2055				
	Through 2030	Through 2040	Through 2050	Through 2055
Construction	307,317	460,976	460,976	460,976
Efficiency Benefits	105,233	631,395	1,262,791	1,578,489
IntraCorridor Trade	223,328	1,925,484	4,567,922	5,959,883
Economic Dev./External Trade	262,844	3,323,310	9,341,763	12,618,277
Construction Offsets	(30,311)	(45,466)	(45,466)	(45,466)
Efficiency Offsets	(7,627)	(45,759)	(91,519)	(114,398)
Agriculture Offsets	(6,233)	(12,467)	(18,700)	(21,817)
TOTAL NET BENEFITS	854,551	6,237,473	15,477,767	20,435,944

*Person-Years



Incremental Output Compared to a “No Build” Scenario: TTC-69 Study Area

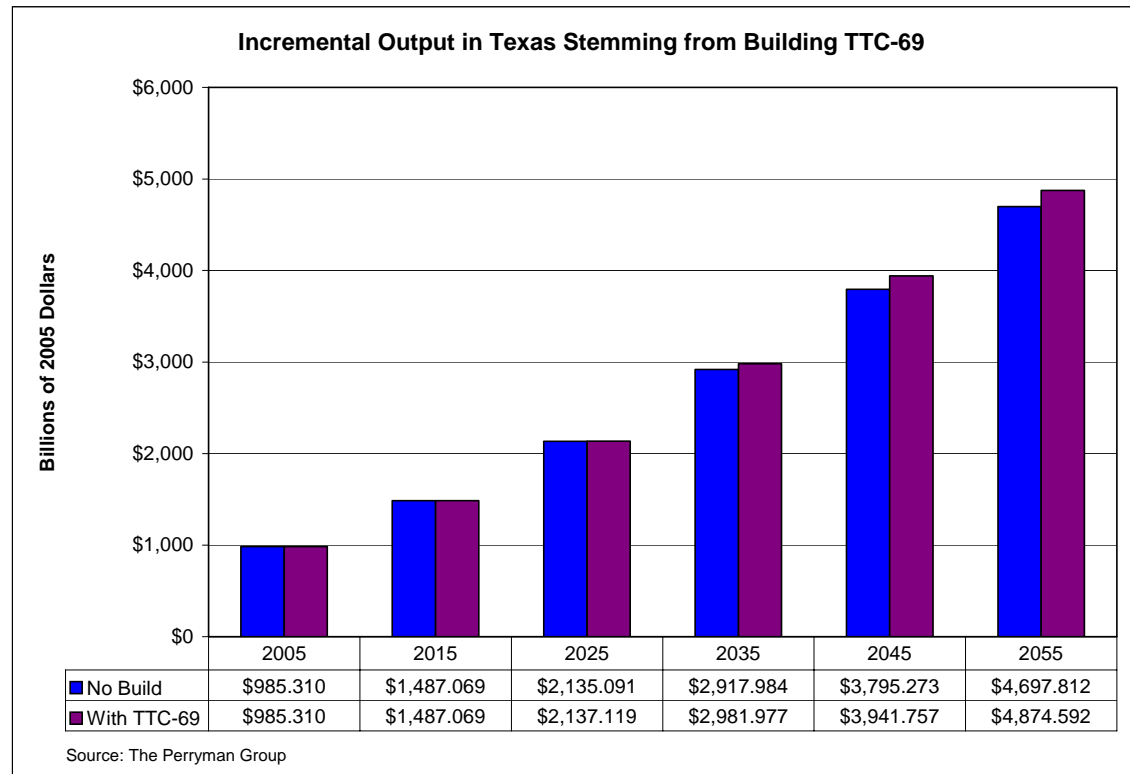
- For the TTC Study Area, annual output (in constant 2005 dollars) increases by more than \$150 billion in 2055 with TTC-69 in place.





Incremental Output Compared to a “No Build” Scenario: Texas

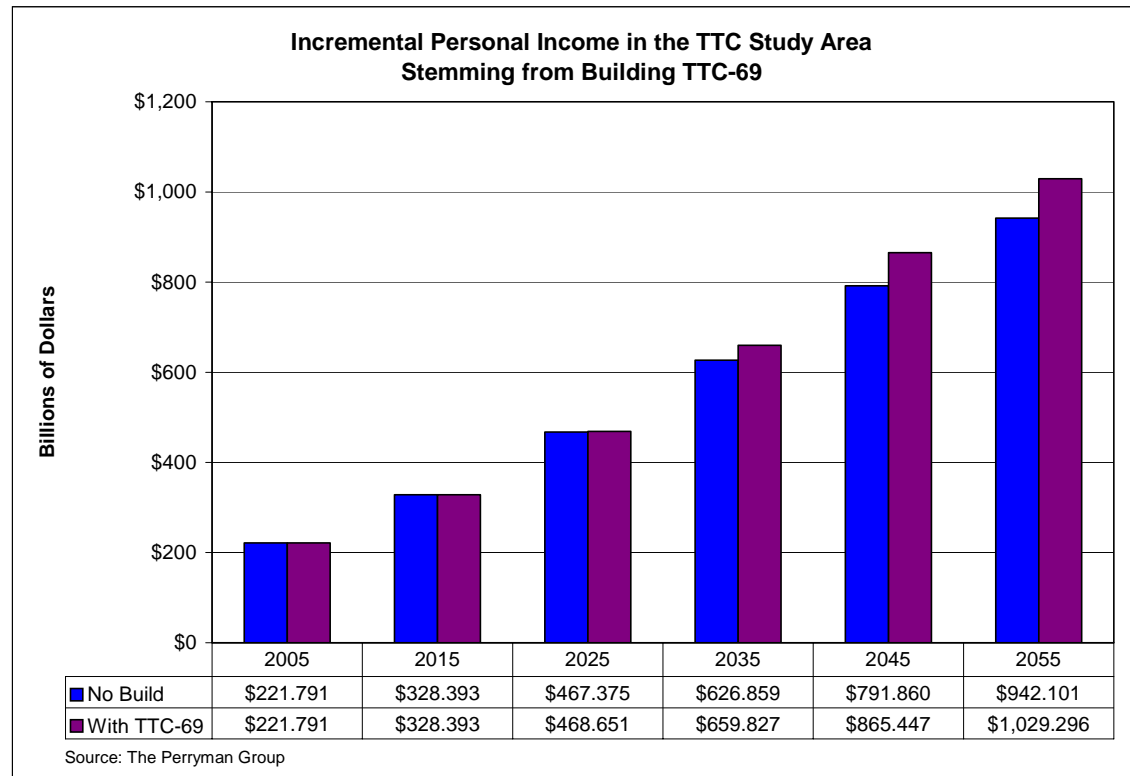
- Construction of TTC-69 generates gains in output (Gross State Product) in 2055 of about \$177 billion (in constant 2005 dollars); these effects would rise markedly over time.





Incremental Personal Income Compared to a “No Build” Scenario: TTC-69 Study Area

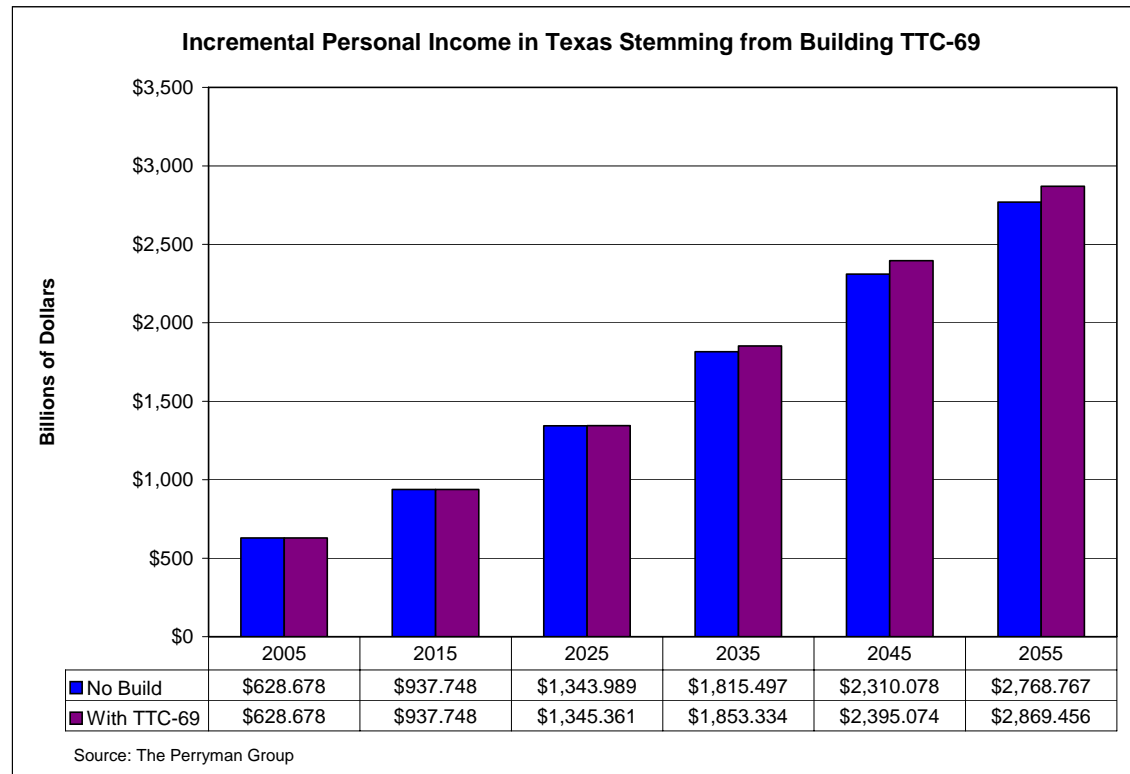
- Building TTC-69 leads to projected gains in personal income of about \$87 billion (in constant 2005 dollars) within the study area over the “No Build” scenario by 2055.





Incremental Personal Income Compared to a “No Build” Scenario: Texas

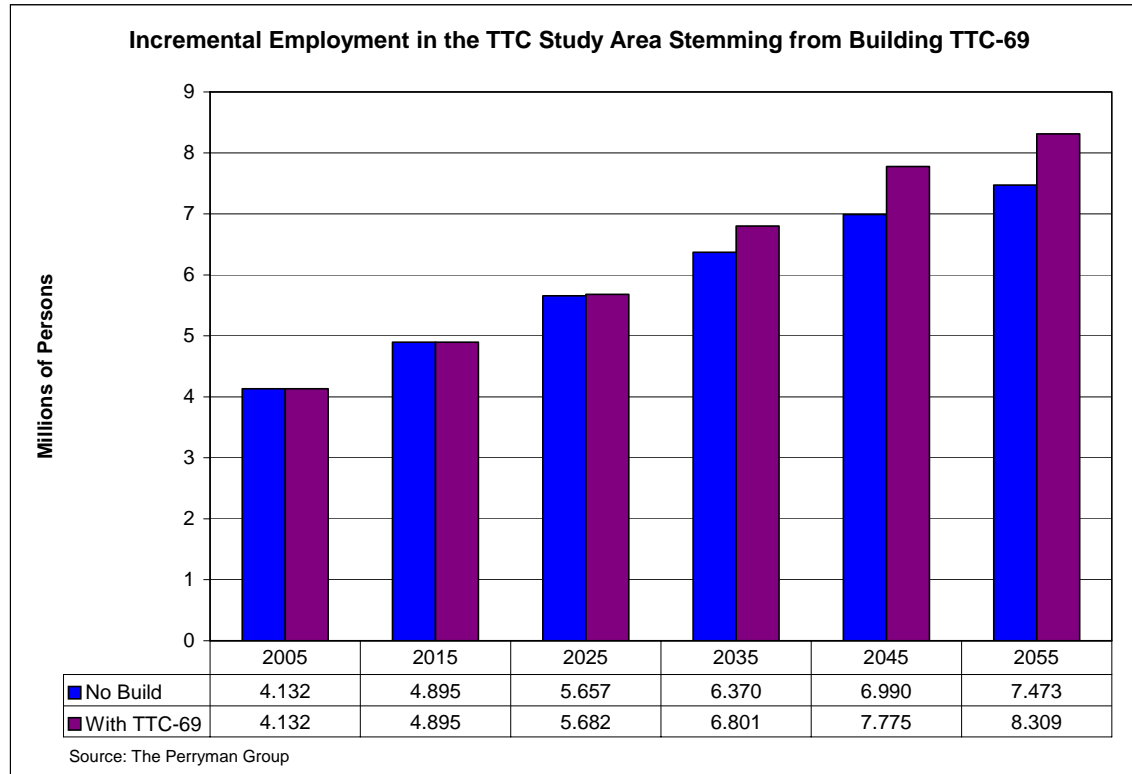
- Personal Income in Texas would be significantly higher due to TTC-69 by 2055, with the increment growing beyond that point.





Incremental Employment Compared to a “No Build” Scenario: TTC-69 Study Area

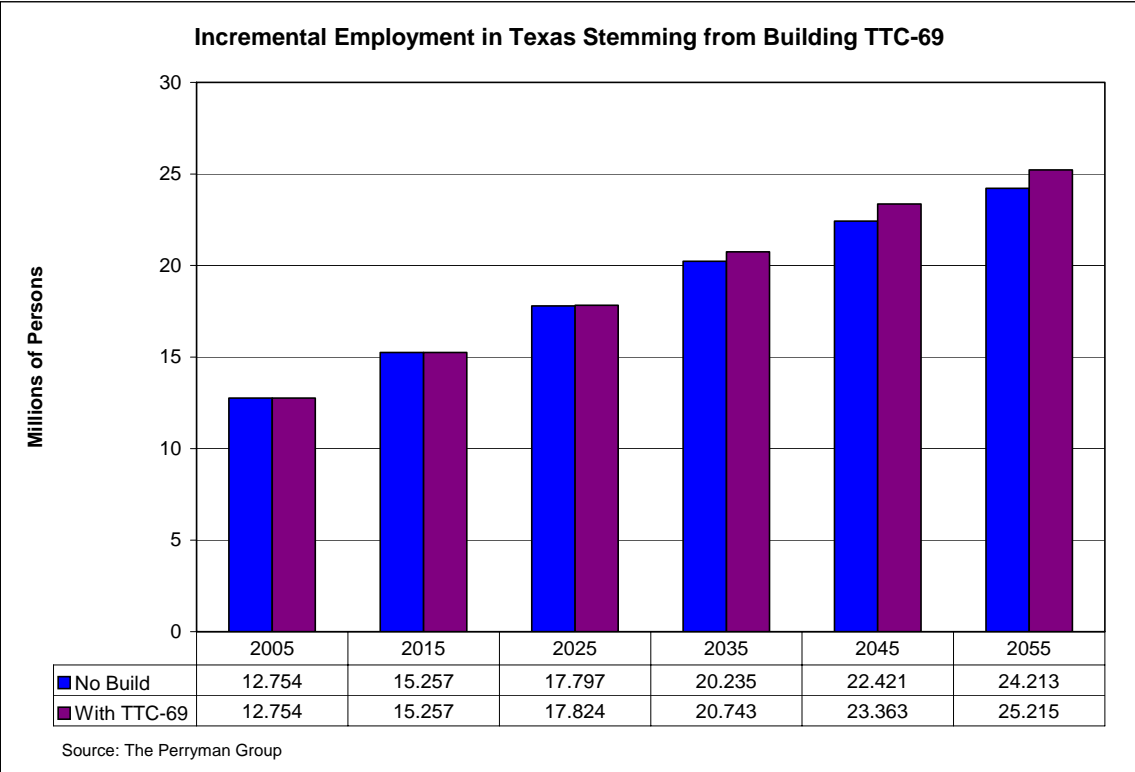
- About 836,000 additional jobs could be expected to be generated with the TTC-69 Study Area by 2055 relative to a “No Build” scenario.





Incremental Employment Compared to a “No Build” Scenario: Texas

■ Texas employment could be expected to be about 1 million higher by 2055 with TTC-69 in place.





TTC-69 Sensitivity Analysis



TTC-69 Sensitivity Analysis: State Funding

- If the unique financing mechanisms implicit in the TTC analysis were not available and the private component was replaced by State fiscal resources, significant delays in corridor development could be expected. For purposes of this analysis, TPG assumed a 10-year delay (it would likely be much longer). In addition, offsets for other construction activity foregone increase as additional funds are channeled into TTC projects.

TTC-69 Cumulative Effects through 2055 of Utilizing 100% State Financing for TTC-69 Construction			
	Baseline NPV* Total	100% State Financing NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$1.36 trillion	(\$1.31 trillion)
Gross Product	\$987 billion	\$502 billion	(\$485 billion)
Personal Income	\$575 billion	\$293 billion	(\$282 billion)
Employment	20,435,944 Person-Years	10,888,227 Person-Years	(9,547,718) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: 100% Private Displacement of Currently Anticipated State Funds

- In this scenario, TPG examined the effects if the State contributions to TTC-69 could be completely replaced by private funding. The result is that the foregone construction and efficiency benefits are restored, thus resulting in a modest net benefit. Such a pattern could only occur if the economic returns to private investors increased to a level that would justify the additional outlays.

TTC-69 Cumulative Effects through 2055 of 100% Private Displacement of Currently Anticipated State Funds			
	Baseline NPV* Total	100% Private Displacement of State Funds NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$2.68 trillion	\$9 billion
Gross Product	\$987 billion	\$991 billion	\$4 billion
Personal Income	\$575 billion	\$578 billion	\$3 billion
Employment	20,435,944 Person-Years	20,595,808 Person-Years	159,864 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorporate trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: 50% Private Displacement of Currently Anticipated State Funds

- While complete displacement of state funds is unlikely, some additional investor funding might become available if additional sources of potential private sector earnings could be identified (or the risk associated with current earnings could be reduced). In the current scenario, TPG considers an intermediate case in which 50% of the currently anticipated State funds are replaced. The resulting ability to deploy these funds to other needed projects reduces the offsets for construction and efficiency to some extent, thus fostering a moderate stimulus.

TTC-69 Cumulative Effects through 2055 of 50% Private Displacement of Currently Anticipated State Funds			
	Baseline NPV* Total	50% Private Displacement of State Funds NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$2.67 trillion	\$4.45 billion
Gross Product	\$987 billion	\$989 billion	\$2.08 billion
Personal Income	\$575 billion	\$576 billion	\$1.39 billion
Employment	20,435,944 Person-Years	20,515,876 Person-Years	79,932 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorporate trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Increase in Enhanced Efficiency

- In this scenario, TPG assumed gains in efficiency of 5% greater than those in the baseline projections. Such an outcome would increase the direct efficiency of various sectors, as well as the propensity for increased intracorridor trade.

TTC-69 Cumulative Effects of a 5% Increase in Enhanced Efficiency through 2055			
	Baseline NPV* Total	Enhanced Efficiency Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$2.80 trillion	\$132 billion
Gross Product	\$987 billion	\$1.04 trillion	\$49 billion
Personal Income	\$575 billion	\$603 billion	\$28 billion
Employment	20,435,944 Person-Years	21,443,777 Person-Years	1,007,832 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Decrease in Enhanced Efficiency

- This scenario assumes that the efficiency gains are 5% less than those anticipated in the baseline projections. This lower level of increase reduces the efficiency improvements across various sectors and decreases the magnitude of the stimulus to intracorridor trade.

TTC-69 Cumulative Effects of a 5% Decrease in Enhanced Efficiency through 2055			
	Baseline NPV* Total	Reduced Efficiency Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67trillion	\$2.53 trillion	(\$132 billion)
Gross Product	\$987 billion	\$938 billion	(\$48.7 billion)
Personal Income	\$575 billion	\$547 billion	(\$28.3 billion)
Employment	20,435,944 Person-Years	19,428,112 Person-Years	(1,007,832) Person-Years



TTC-69 Sensitivity Analysis: More Rapid Population Growth

- This scenario examines the net change assuming a migration rate to the state equal to that experienced over the 1990-2000 timeframe; this rate is somewhat higher than current estimates of future in-migration (66.58% of the level in the 1990s under baseline conditions). Greater population growth enhances the need for the various projects and stimulates additional intracorridor trade.

TTC-69 Cumulative Effects of More Rapid Population Growth through 2055 (100% of 1990-2000 Migration Level)			
	Baseline NPV* Total	More Rapid Population Growth Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$2.77 trillion	\$101 billion
Gross Product	\$987 billion	\$1.03 trillion	\$47 billion
Personal Income	\$575 billion	\$603 billion	\$28 billion
Employment	20,435,944 Person-Years	21,836,641 Person-Years	1,400,696 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Slower Population Growth

- In this scenario, TPG examines the consequences of somewhat lower population growth. In particular, it is assumed that migration to Texas occurred at a rate of only 50% of the 1990-2000 level (vs. 66.58% in the Baseline case). Lower population growth reduces the opportunities to expand intracorridor trade.

TTC-69 Cumulative Effects of Slower Population Growth through 2055 (50% of 1990-2000 Migration Level)			
	Baseline NPV* Total	Slower Population Growth Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$2.62 trillion	(\$50.8 billion)
Gross Product	\$987.2 billion	\$963.5 billion	(\$23.7 billion)
Personal Income	\$575.1 billion	\$561.2 billion	(\$13.9 billion)
Employment	20,435,944 Person-Years	19,734,316 Person-Years	(701,628) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Lower Level of Intracorridor Trade and External Trade/Economic Development

- As noted earlier, the assumptions regarding intracorridor trade and external trade/economic development are based on reasonable and conservative premises and produce impacts which are consistent with expectations based on past experience and other indicia (see the *Technical Analysis* for a more extensive discussion). Nonetheless, future outcomes are subject to significant uncertainty and ultimate outcomes could be substantially different in either direction. This scenario illustrates the consequences of achieving only 50% of the levels of internal and external “value capture” reflected in the Baseline case.

TTC-69 Cumulative Effects of a Lower “Value Capture” on Internal and External Activity (50% of Baseline Level)			
	Baseline NPV* Total	Lower “Value Capture” Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$1.38 trillion	(\$1.28 trillion)
Gross Product	\$987.2 billion	\$516.6 billion	(\$470.7 billion)
Personal Income	\$575.1 billion	\$302.9 billion	(\$272.1 billion)
Employment	20,435,944 Person-Years	11,146,864 Person-Years	(9,289,080) Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Lower Real Discount Rate

- The baseline projections are presented using a 3% real (inflation-adjusted) discount rate. This rate is indicative of a nominal rate which is above the current financing rates for revenue bonds of comparable type and maturity. Market conditions, inflation, and other factors can impact the ultimate level of risk associated with the initiative. This scenario examines the consequences for long-term returns of using a lower, 2% real discount rate.

TTC-69 Cumulative Effects of Using a Lower Real (Inflation-Adjusted) Discount Rate (2%) through 2055			
	Baseline NPV* Total	2% Discount Rate Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$3.87 trillion	\$1.20 trillion
Gross Product	\$987.2 billion	\$1.43 billion	\$441.7 billion
Personal Income	\$575.1 billion	\$832.0 billion	\$256.2 billion
Employment	20,435,944 Person-Years	20,435,944 Person-Years	0 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



TTC-69 Sensitivity Analysis: Higher Real Discount Rate

- This scenario examines the consequences for long-term effects if risk is increased, as reflected in a real (inflation-adjusted) discount rate of 4% (relative to a 3% baseline rate).

TTC-69 Cumulative Effects of Using a Higher Real (Inflation-Adjusted) Discount Rate (4%) through 2055			
	Baseline NPV* Total	4% Discount Rate Scenario NPV* Total	Net Change NPV* Total
Expenditures	\$2.67 trillion	\$1.85 trillion	(\$810.2 billion)
Gross Product	\$987.2 billion	\$687.4 billion	(\$298.9 billion)
Personal Income	\$575.1 billion	\$400.9 billion	(\$173.5 billion)
Employment	20,435,944 Person-Years	20,435,944 Person-Years	0 Person-Years

* NPV Total is the Net Present Value Total including (1) the positive effects from construction impacts, efficiency benefits, intracorridor trade, and economic development/external trade, as well as (2) offsets for foregone potential construction and efficiency gains from other projects and lost agricultural production.



Results of the Impact Analysis: Total “Conceptual” TTC Plan



The “Conceptual” TTC Plan

- In addition to segments of TTC-35 and TTC-69 which are presently in various stages of development and have been analyzed in preceding sections, the “conceptual” plan for the Trans-Texas Corridor as originally outlined involves numerous additional elements. These initiatives include
 - additional lanes and rail facilities associated with TTC-35,
 - freight and passenger rail lines associated with TTC-69,
 - two additional “priority” corridors essentially paralleling the existing Interstate 45 and Interstate 10, and
 - several additional corridors in other parts of the state.

- It was recognized from the outset that (1) the timeframes on these initiatives might be quite extended, and (2) they would only be developed as justified by demand in a manner consistent with attracting requisite levels of private investment.

- While no attempt was made to assess the timing of these endeavors, TPG did prepare basic estimates of their overall economic impact. These results include (1) separate (gross and net) construction impacts (in constant 2005 dollars), (2) separate “efficiency” benefits and offsets (in constant 2005 dollars), and (3) aggregate measures across all sectors for offsetting losses in agricultural production, benefits from enhanced intrastate trade, and gain from the stimulus to economic development and global competition. As in the prior analysis, all such gains are based on conservative “1% capture” scenarios. Moreover, all aggregate benefits were measured “as if” they were completed in 2030. Although most projects will be implemented well after that time, this benchmark is useful in that (1) complete industrial forecast data are available at a highly detailed level from the Texas Econometric Model, (2) actual benefits will be substantially higher once the projects are fully implemented, and (3) a common date is useful for “apples-to-apples” comparisons.

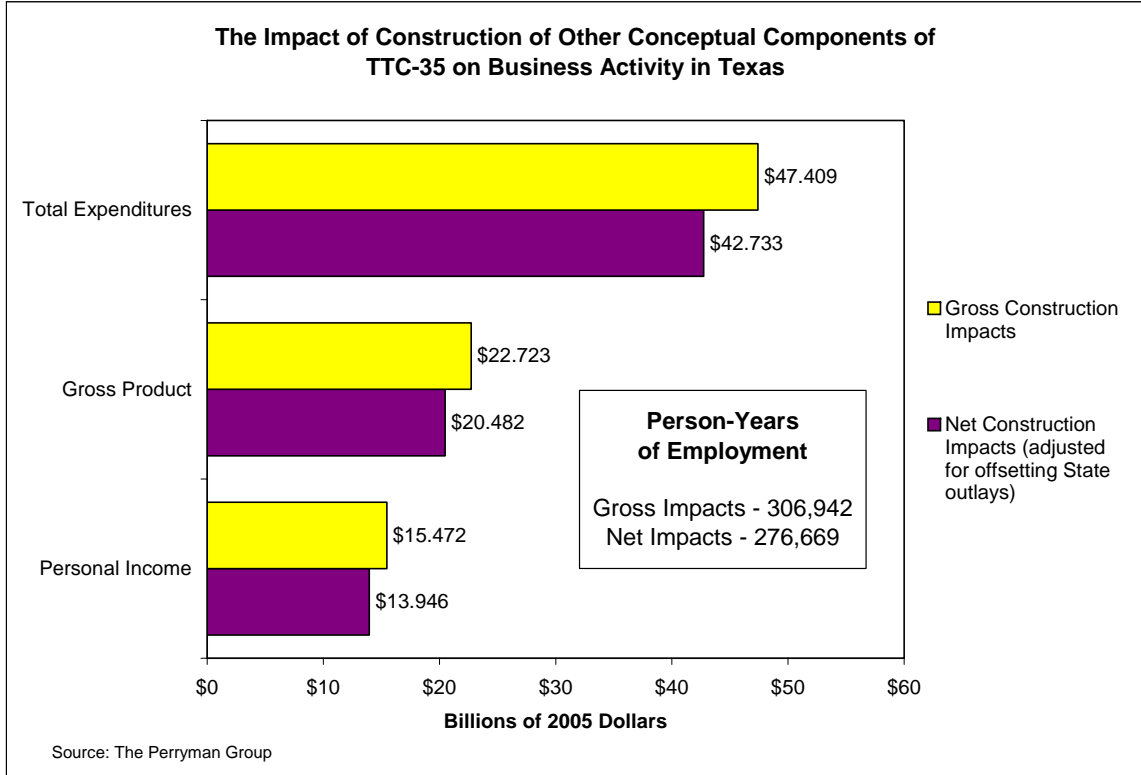


Construction Impacts—“Conceptual” TTC Plan



Impact of Construction of Other Conceptual Components of TTC-35

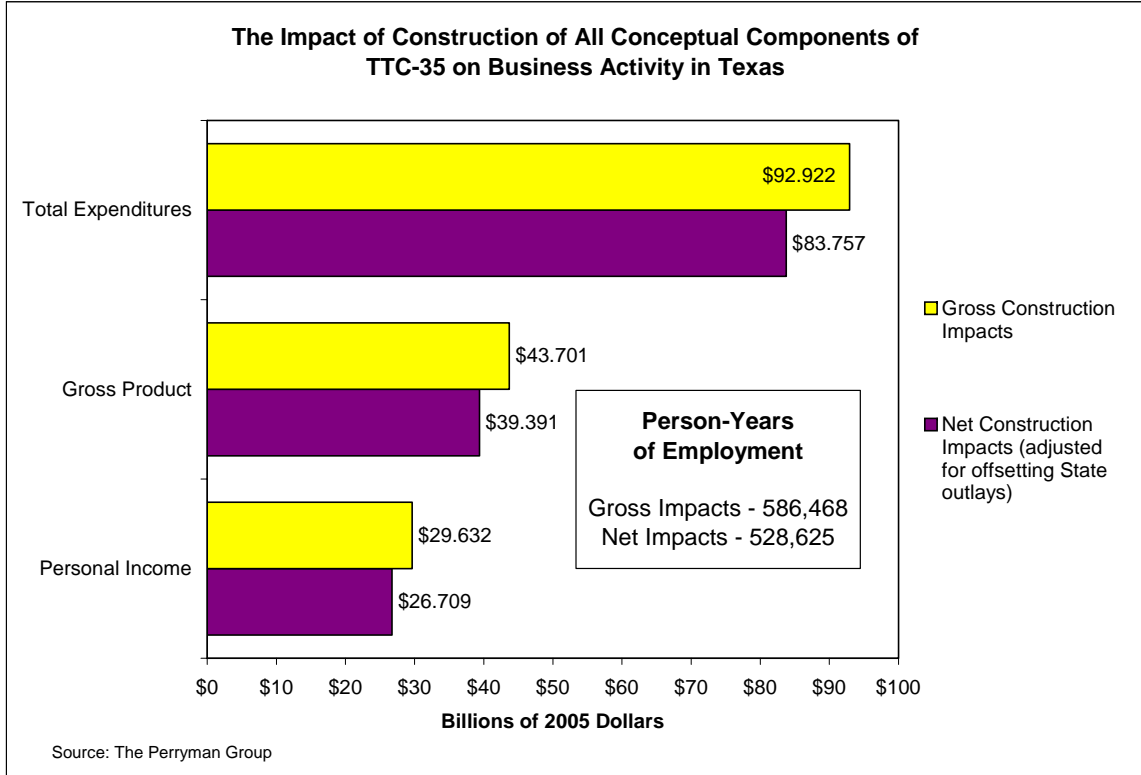
- If other conceptual components of the TTC-35 corridor (such as additional lanes and rail linkages) are ultimately constructed, the state will see additional net benefits as the project moves forward.





Impact of Construction of All Conceptual Components of TTC-35

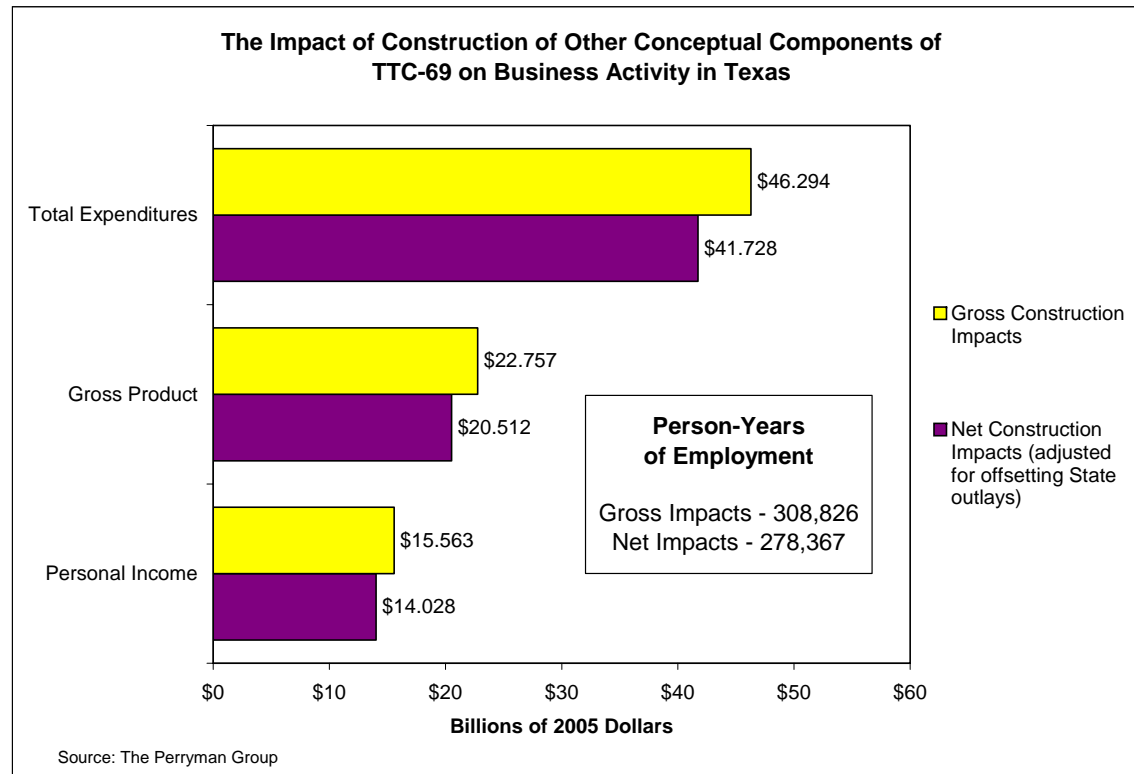
- With construction of all conceptual components of TTC-35 (including those currently in development), incremental business activity on a "net" basis is almost \$40 billion (in constant 2005 dollars) in gross product and more than 500,000 person-years of employment.





Impact of Construction of Other Conceptual Components of TTC-69

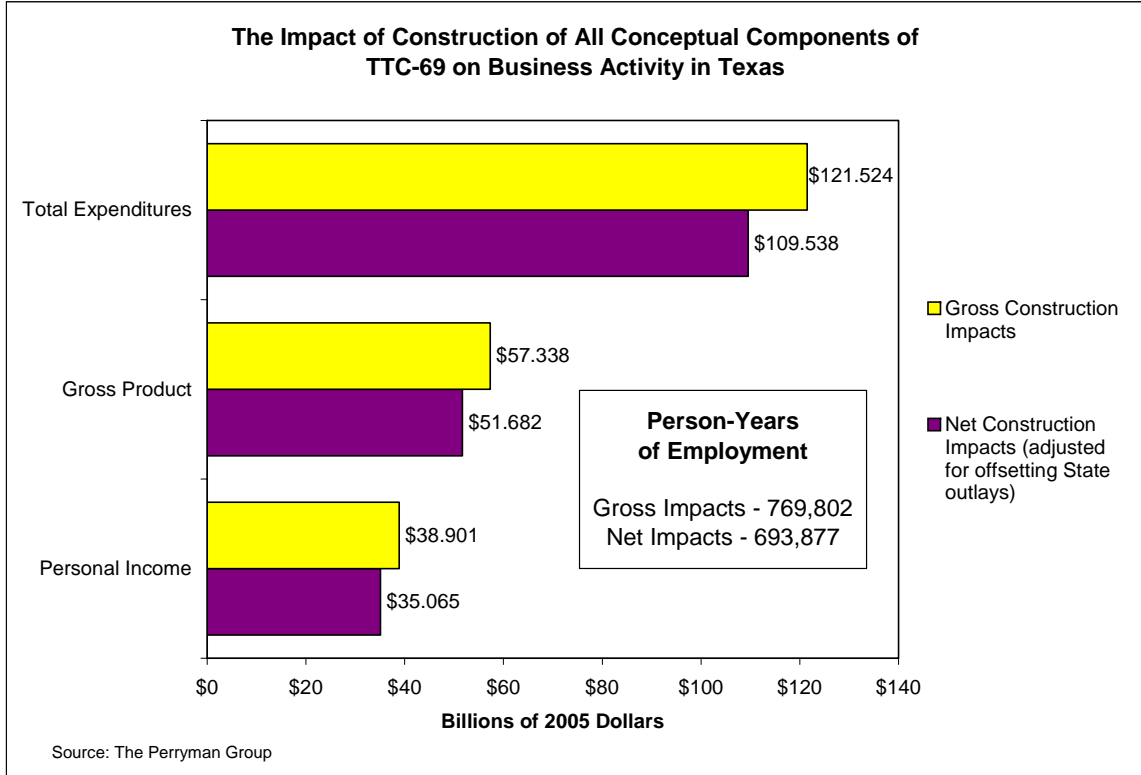
- In addition to the TTC-69 segments currently under consideration, conceptual plans call for a comprehensive freight and passenger rail system. The construction of these projects would involve a significant increment to business activity.





Impact of Construction of All Conceptual Components of TTC-69

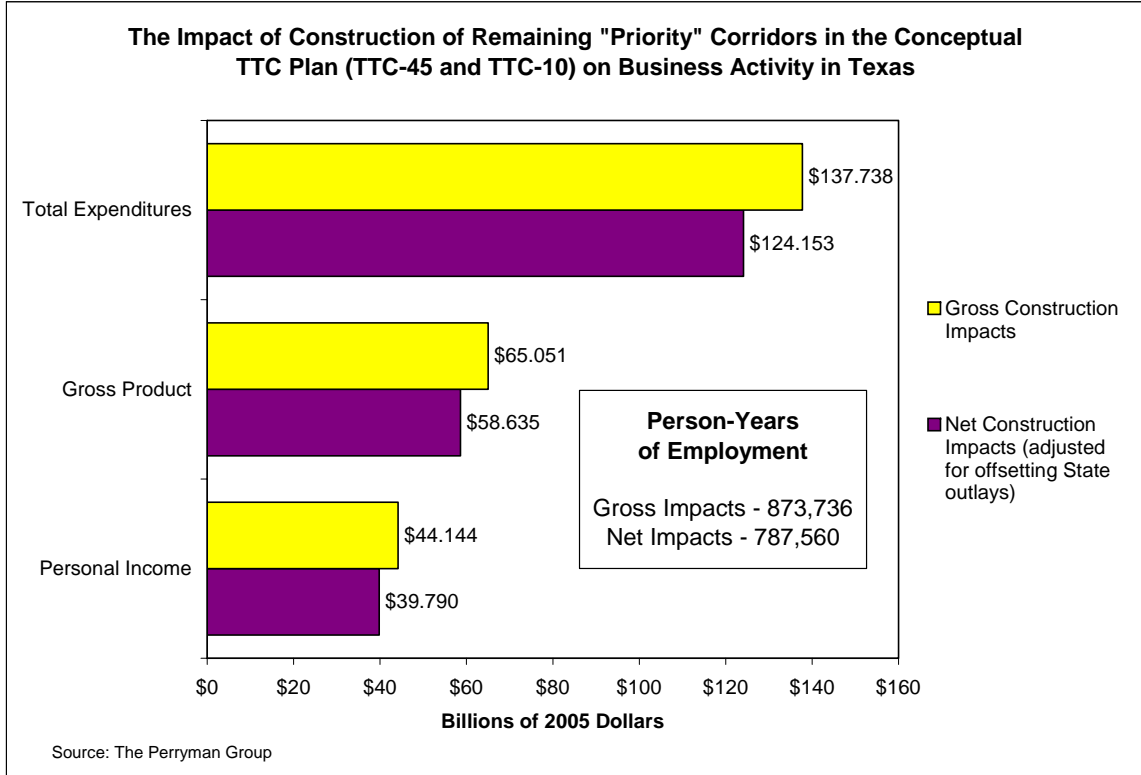
- By aggregating the impacts of the TTC-69 projects (including all highway and rail segments in the conceptual plan), a total measure of the impact of corridor construction can be obtained.





Impact of Construction of Remaining “Priority” Corridors in the Conceptual TTC Plan

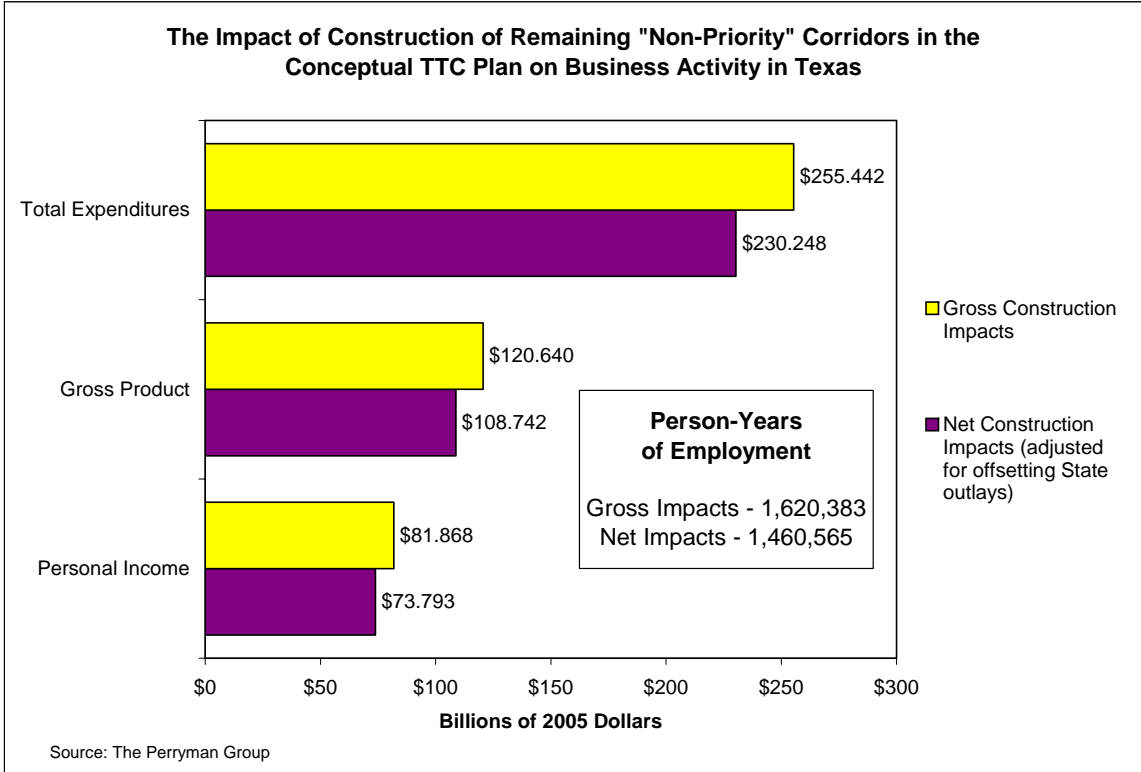
■ In addition to TTC-35 and TTC-69, two other priority corridors have been designated. These routes, TTC-45 and TTC-10, connect major population and production centers within the state and would substantially enhance efficiency, development, and trade opportunities. The impact of constructing these facilities is summarized below.





Impact of Construction of “Non-Priority” Corridors in the Conceptual TTC Plan

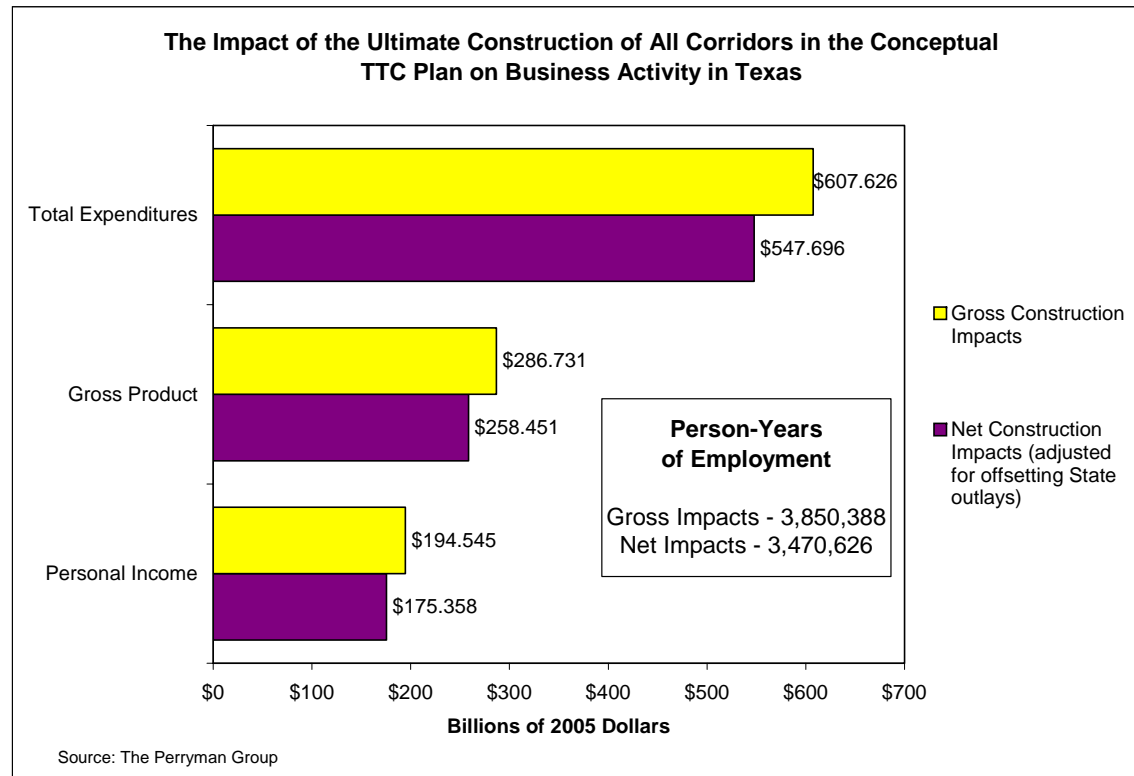
- The conceptual TTC plan also includes numerous other segments linking key areas. Although these corridors will not be developed in the absence of adequate economic justification, their ultimate construction would further enhance the competitiveness of Texas in the world business environment.





Impact of Constructing All Corridors in the Conceptual TTC Plan

- If all conceptual components of the TTC plan were ultimately constructed, the additional stimulus to business activity in Texas would be substantial, with the bulk of the funding derived from private sources.



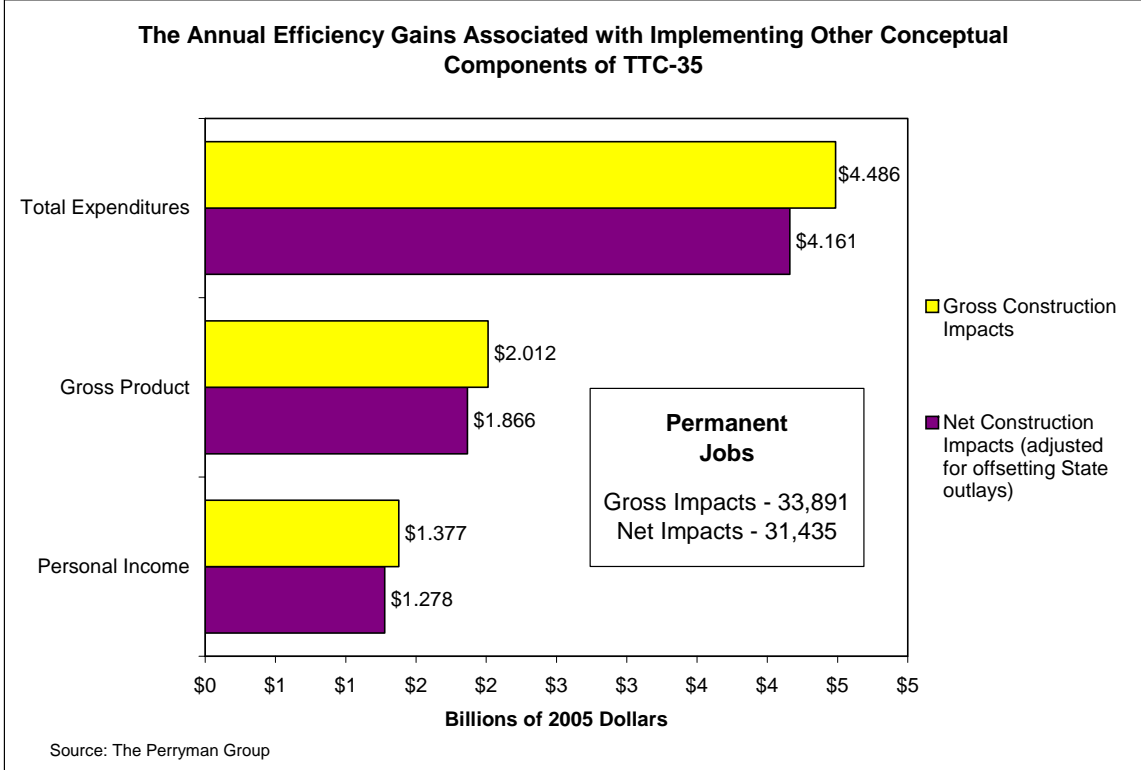


Efficiency Impacts—“Conceptual” TTC Plan



Efficiency Gains from Implementing Other Conceptual Components of TTC-35

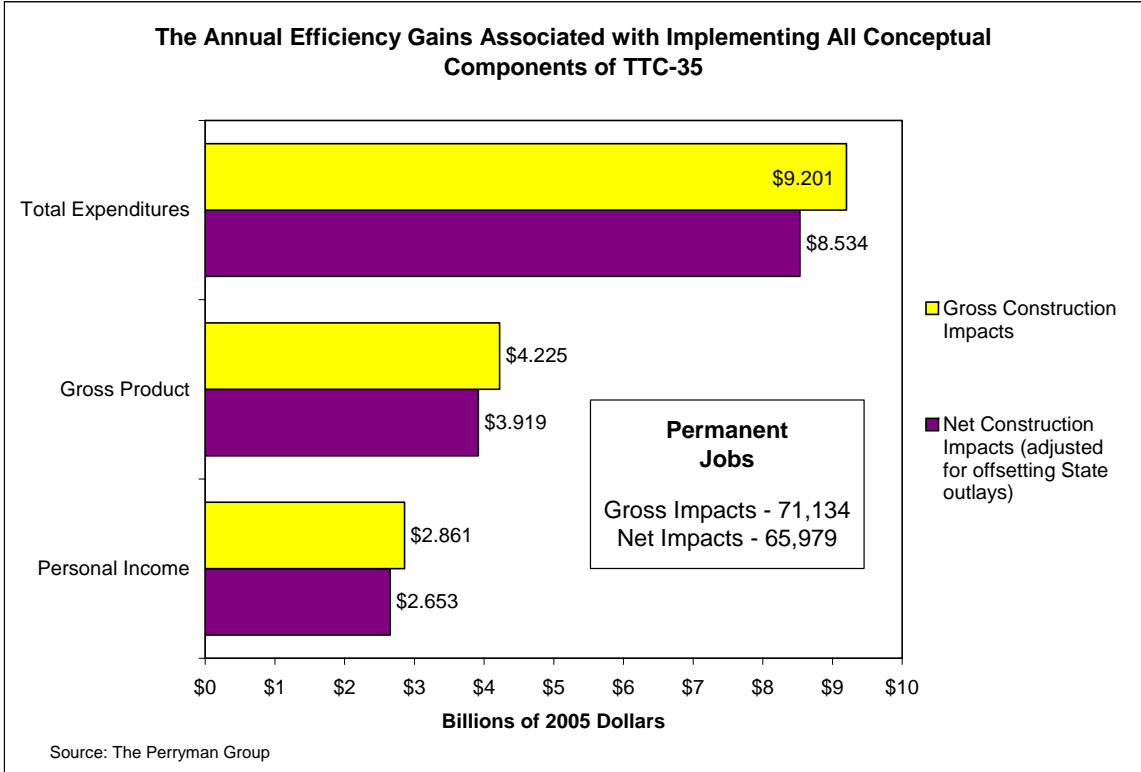
- If the remaining components of the conceptual TTC-35 plan are ultimately implemented, the increased accessibility will further enhance economic efficiency.





Efficiency Gains from Implementing All Conceptual Components of TTC-35

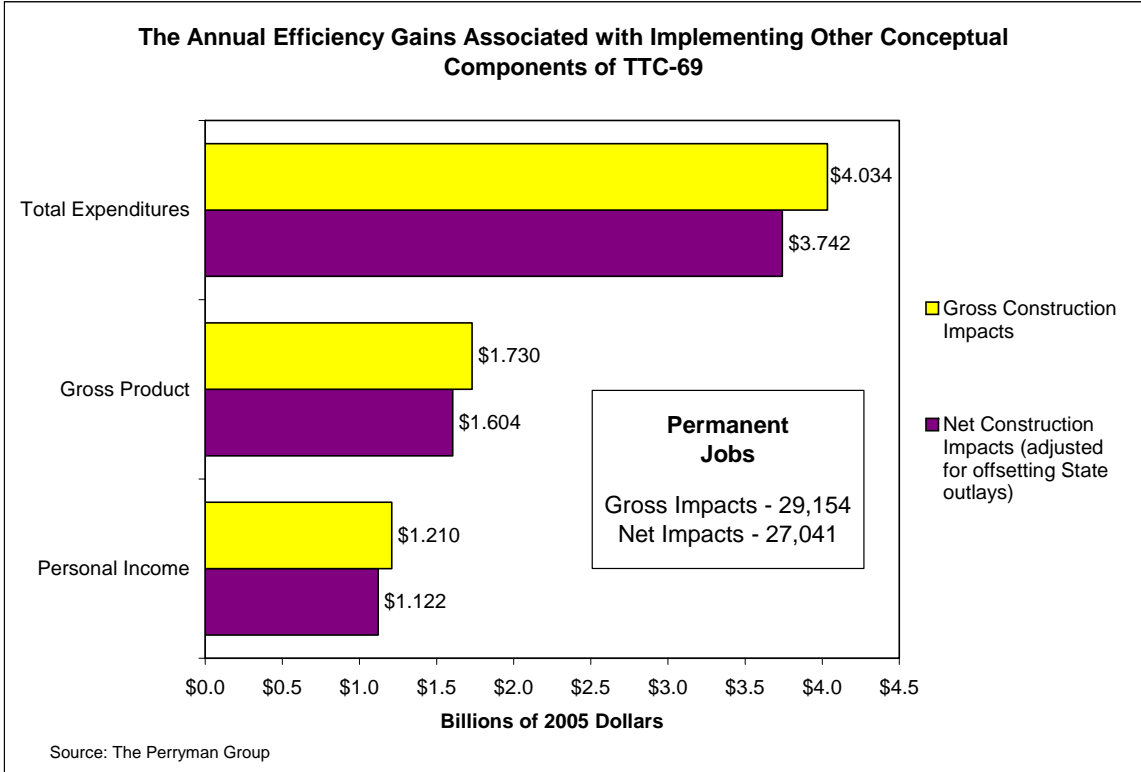
- The full development of all aspects of the conceptual TTC-35 initiative would result in net gains of more than \$8.5 billion in annual expenditures (in constant 2005 dollars) and almost 66,000 permanent jobs as a result of the efficiency gains.





Efficiency Gains from Implementing Other Conceptual Components of TTC-69

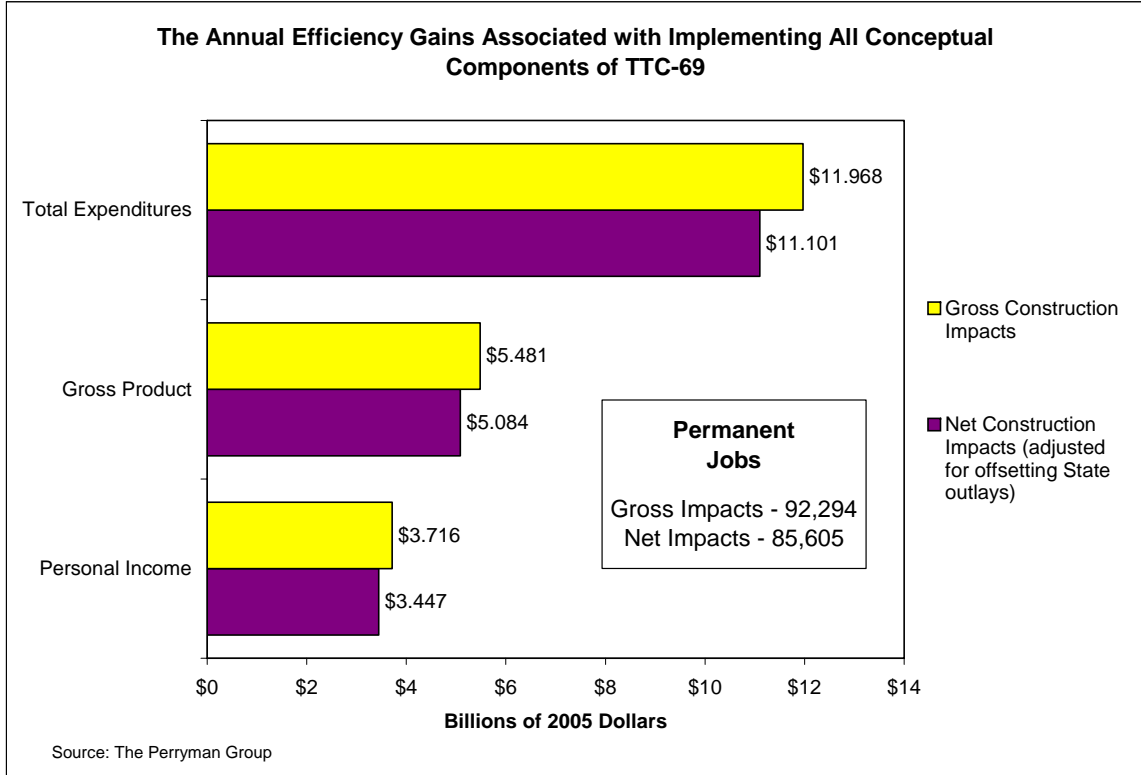
- The development of the remaining conceptual elements of TTC-69 would ultimately lead to notable gains in economic efficiency on an ongoing basis.





Efficiency Gains from Implementing All Conceptual Components of TTC-69

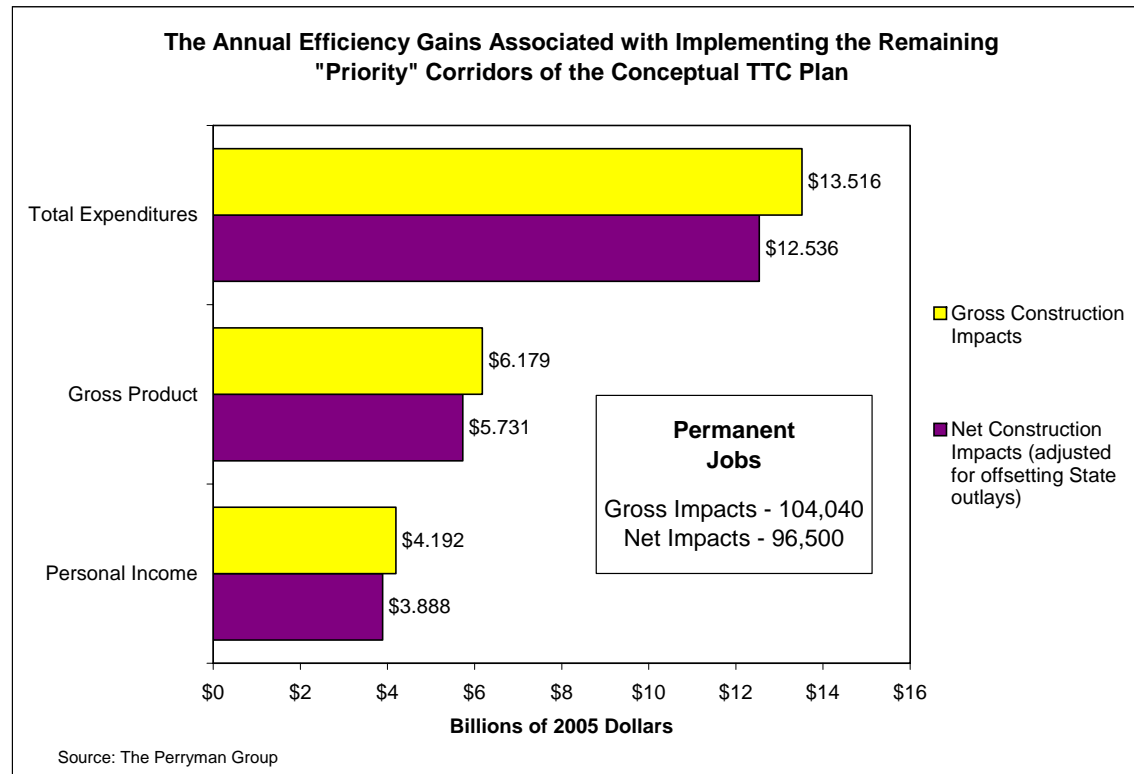
- The ultimate development of all of the components of TTC-69 as originally conceived would lead to an ongoing net stimulus of more than \$11.1 billion per year in aggregate outlays (in constant 2005 dollars) and in excess of 85,000 permanent jobs as a consequence of the anticipated efficiency enhancements.





Efficiency Gains from Implementing the Remaining “Priority” Corridors of the Conceptual TTC Plan

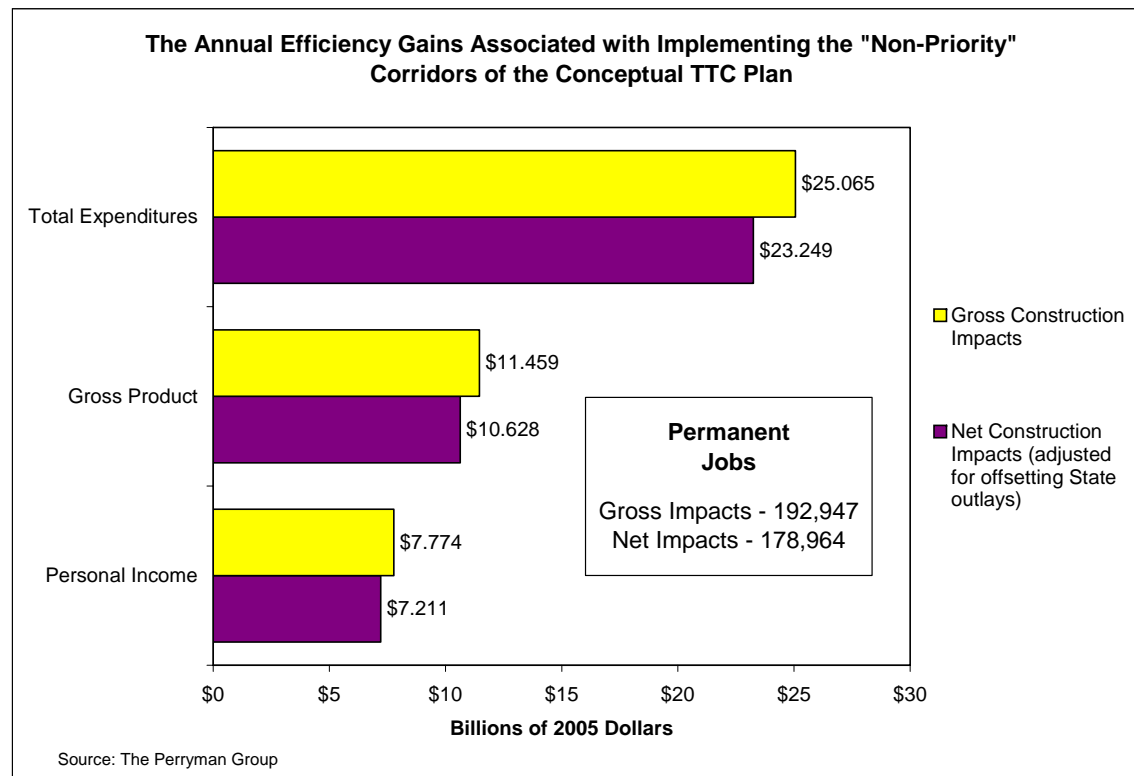
- As it becomes economically appropriate to implement the TTC-45 and TTC-10 plans, a substantial annual stimulus will be realized as a result of efficiency enhancements. These gains are estimated to include net yearly increases of \$12.5 billion in spending (in constant 2005 dollars) and 96,500 permanent jobs.





Efficiency Gains from Implementing the “Non-Priority” Corridors in the Conceptual TTC Plan

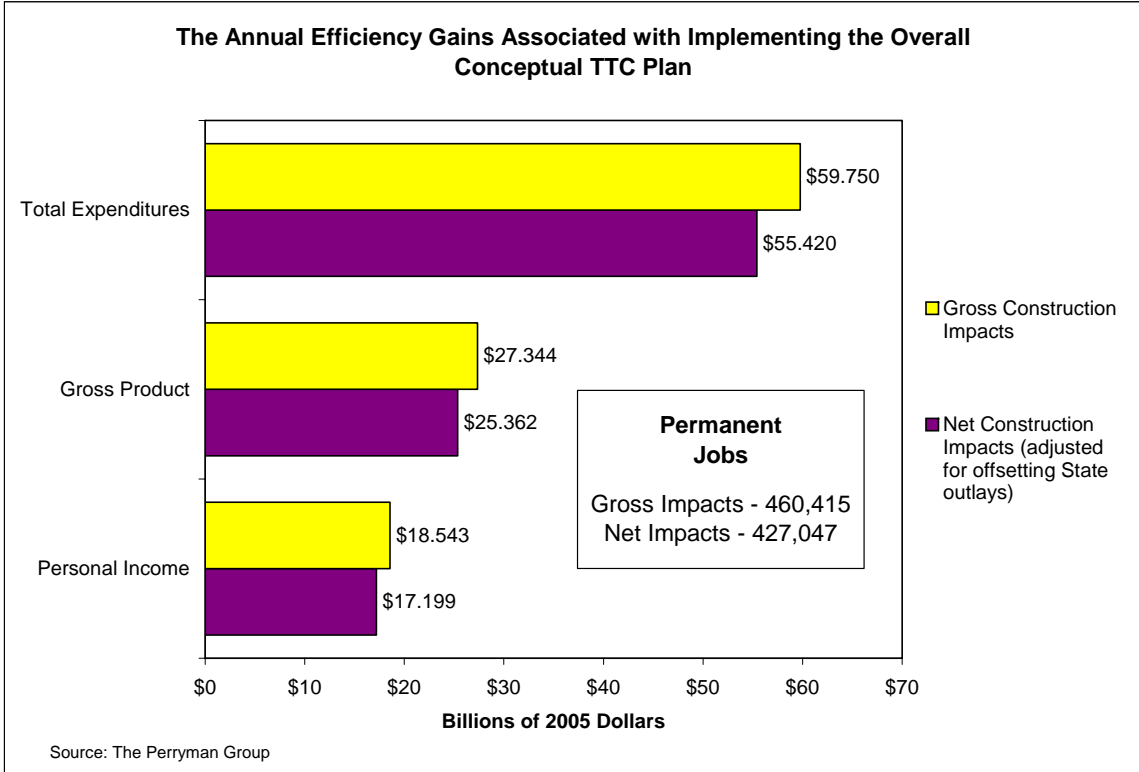
- If economic growth ultimately engenders sufficient demand to support substantial private sector investment in the “non-priority” TTC segments, overall efficiency within the state will rise. If all of these routes were implemented, net annual spending of \$23.2 billion (in constant 2005 dollars) and a gain of almost 179,000 permanent jobs would be observed for the projected efficiency improvements.





Efficiency Gains from Implementing the Overall Conceptual TTC Plan

- If the entire TTC plan as originally conceived were implemented at some point in the future, the annual net impacts would include \$55.4 billion in spending, \$25.4 billion in gross state product, and \$17.2 billion in personal income (in constant 2005 dollars). More than 425,000 permanent jobs would be generated solely as a result of the efficiency enhancements.



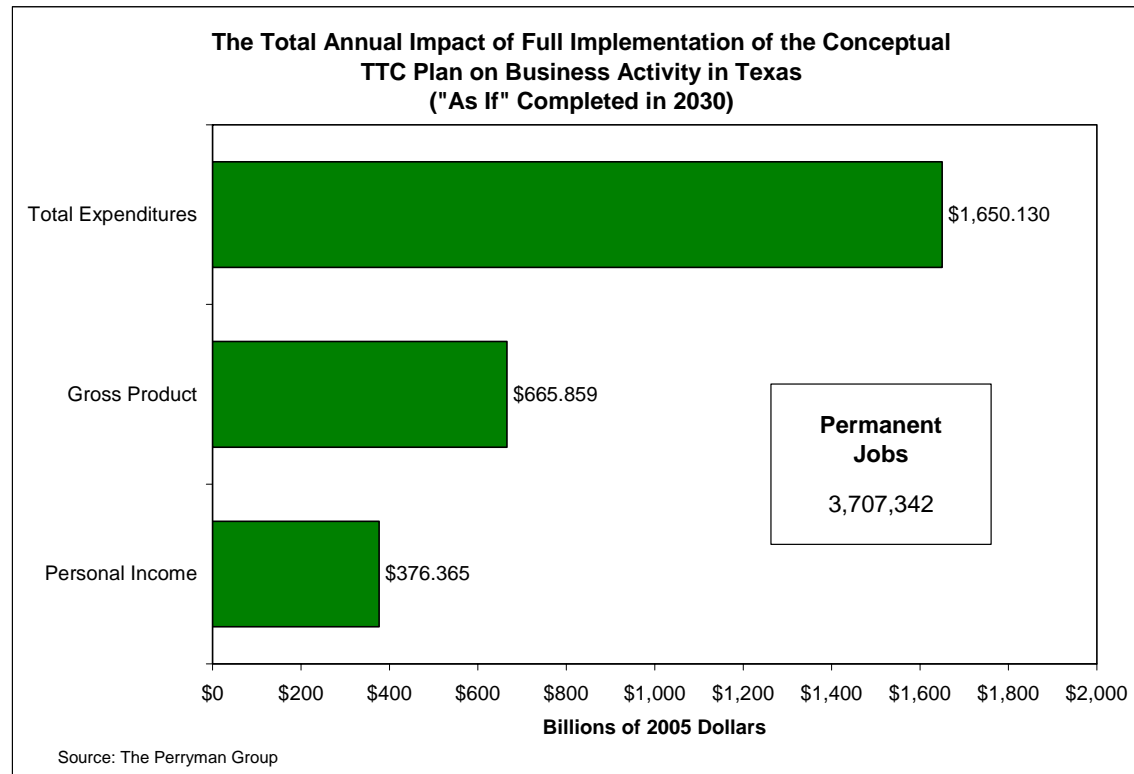


Total Annual Impacts—“Conceptual” TTC Plan



Ongoing Annual Impacts of the Entire Conceptual TTC Plan

- In order to illustrate the potential of the TTC conceptual plan, TPG simulated the complete net impact of the program (including net efficiency, intrastate trade, and economic development/external trade) on an annual basis "as if" the full implementation was completed in 2030. (In reality, the completion will ultimately occur much later (if ever), thus generating even greater benefits due to a larger economic base.)





CONSTITUENCY PERSPECTIVES



Industrial Perspective

- The TTC would enhance efficiency, improve logistics, and reduce transportation time and costs. These factors serve to increase competitiveness and profitability across a broad spectrum of industrial sectors.
- The TTC would reduce commuting time, improve safety, and contribute to environmental quality, all of which enhance the ability to attract and retain employees.
- The TTC would increase the opportunities to obtain additional sales from within the relevant corridors, both to other firms and consumers.
- The TTC would increase the capacity of firms along the completed segments to sell into external markets.
- The various segments scheduled for development in the coming years stimulate hundreds of billions of dollars in additional sales each year, greatly benefiting producers relatively proximate to the enhanced infrastructure.



Business Development Perspective

- The TTC would reduce costs, increase accessibility, and improve linkages to external markets. All of these factors increase the competitiveness of Texas as a site for corporate locations and expansions.
- The enhanced efficiency and unique use of private resources to facilitate transportation provide effective marketing tools to demonstrate the viability and desirability of locations in Texas.
- The TTC promotes several types of enhancements to quality-of-life, including reduced travel time and congestion, greater public safety, and lower emissions in urban centers. These characteristics are increasingly important in attracting knowledge-based workers and firms in high-growth sectors.
- Even under very conservative assumptions, the economic development benefits of the TTC initiative are quite substantial.



Municipality and Other Local Government Perspectives

- The enhanced activity generated by the TTC provides investment, job opportunities, and increased tax revenues throughout the relevant areas.
- The net taxable value of agricultural land along the TTC-35 Corridor is expected to rise by a minimum of 8.1% based on aggregate receipts (net of land removed for right-of-way). To the extent that areas are converted to non-agricultural uses, such as commercial or industrial, values will increase to an even greater extent. Moreover, at project maturity, local government revenues from other sources (such as sales and occupancy taxes) will increase by about \$1.39 billion per year (in constant 2005 dollars). These amounts can be used to make enhancements in public services and other infrastructure to accommodate the higher levels of business activity and prosperity.
- With respect to the TTC-69 Corridor, the total net taxable value of agricultural land (fully accounting for the maximum amount of land to be reused for construction) will increase by at least 4.8% at maturity. The conversion of some parcels to other uses will result in substantial additional revenues. Other taxes for local governmental entities will rise by at least \$637.8 million per annum, thus providing resources to expand public services and infrastructure.



Agricultural Perspective

- As with all infrastructure projects requiring right-of-way, some land is removed from its prior use. In all cases, owners will be fully compensated at fair market value (which is typically well above “productive” value).
- Even using maximum reductions in agricultural production, the annual benefits to farmers and ranchers from enhanced efficiency and development exceed the losses by a ratio of 39.4 to 1 in the TTC-35 Study Area and 15.9 to 1 in the TTC-69 Study Area.
- Under the conservative value capture scenarios for intracorridor and external trade, the agricultural sector enjoys a net gain of \$1.67 billion per year (in constant 2005 dollars at maturity) and 10,927 jobs along the TTC-35 route. The corresponding values for TTC-69 are \$980.8 million and 7,190, respectively.
- Even in the absence of intracorridor and external trade gains, the net impact on the agricultural sector remains positive in both corridors.



Other Stakeholder Perspectives

- Individuals within the corridor areas would enjoy reduced travel times, more cost-effective purchasing options, and increased job opportunities.
- Local residents also benefit from lower levels of congestion, greater public safety, and improved environmental conditions.
- By leveraging private resources, the State is able to increase overall competitiveness and the business climate. At maturity, the activity generated with TTC-35 brings an annual increment to State revenue of approximately \$6.9 billion per annum (in constant 2005 dollars), while TTC-69 offers a yearly revenue enhancement to the State of about \$3.2 billion. These funds provide resources to meet the public sector needs of a more robust economy.



CONCLUSION



Conclusion

- Economic and population growth have strained many aspects of Texas' transportation infrastructure, particularly in urban areas. Congestion not only decreases safety, it also reduces economic efficiency, raises costs, and otherwise hampers the competitiveness of the state economy. The TTC will significantly increase transportation capacity and relieve some of the current traffic congestion across Texas. It represents an innovative mechanism to leverage scarce resources in an optimal manner. Although it involves substantial costs, these will be spread over time and will involve both public and private entities.
- TTC development will stimulate business activity and investment in the areas along the corridor routes. Because the TTC enhances efficiency, improves logistics, and reduces transportation time and costs, it increases the ability of companies within the region to expand intrastate trade and operations, and, thus, increase market size and market share on a global basis. These factors improve competitiveness and profitability across a broad spectrum of industrial sectors, and the strategic position of Texas as a site for corporate locations and expansions is enhanced.
- The economic stimulus associated with development of the TTC system is quite substantial; The Perryman Group quantified these gains under a conservative set of assumptions. Over the next 25 years, the cumulative overall benefits of TTC-35 (a corridor that essentially parallels the current Interstate 35) are estimated to include \$1.429 trillion (in constant 2005 dollars) in gross state product (\$845.5 billion on a net present value basis) and 14.829 million person-years of employment. Over a 50-year horizon, the benefits are even larger. Other corridors, such as the proposed TTC-69, also offer notable benefits.



Conclusion (cont.)

- The enhanced activity generated by the TTC benefits businesses, individuals, communities, and other constituencies. It provides investment, job opportunities, and increased tax revenues throughout the area. Using land in this manner will cause only a minimal reduction in the property tax base and property taxes, but stands to bring gains to areas proximate to the routes and surrounding regions which far outweigh any such losses. Individuals and businesses able to utilize the improved highway infrastructure will also benefit, and the competitiveness of the state will be substantially enhanced. The net taxable values of land along the corridors are expected to rise significantly, and local government revenues from other sources (such as sales and occupancy taxes) will increase notably.
- By leveraging private resources, the State is able to increase overall competitiveness and the business climate. At maturity, the activity generated with TTC-35 brings an annual increment to State revenue of approximately \$6.9 billion per annum (in constant 2005 dollars), while TTC-69 offers a yearly revenue enhancement to the State of about \$3.2 billion.
- With the growing population and expanding economy of Texas, transportation constraints and congestion will only worsen over the coming years. The TTC will improve the transportation capacity to meet the long-term growth needs of the Lone Star State. The enhanced system of transportation will increase productivity and earnings of companies operating within the state, and strengthen the attractiveness of Texas as a location for other businesses. With decreasing congestion and the resulting positive impact on quality of life, the state also becomes more attractive as a location for knowledge-based firms and other desirable sectors for economic development. Developing the state's transportation network is vital to future prosperity. The TTC is an important mechanism to achieve that objective.



APPENDIX



Definitions of Key Concepts

- The USMRIAS generates estimates of the effect on several measures of business activity. The most comprehensive measure of economic activity used in this study is **Total Expenditures**. This measure incorporates every dollar that changes hands in any transaction. For example, suppose a farmer sells wheat to a miller for \$0.50; the miller then sells flour to a baker for \$0.75; the baker, in turn, sells bread to a customer for \$1.25. The Total Expenditures recorded in this instance would be \$2.50, that is, $\$0.50 + \$0.75 + \$1.25$. This measure is quite broad, but is useful in that (1) it reflects the overall interplay of all industries in the economy, and (2) some key fiscal variables such as sales taxes are linked to aggregate spending.
- A second measure of business activity frequently employed in this analysis is that of **Gross Product**. This indicator represents the regional equivalent of Gross Domestic Product, the most commonly reported statistic regarding national economic performance. In other words, the Gross Product of, say, Amarillo is the amount of US output that is produced in that area. It is defined as the value of all final goods produced in a given region for a specific period of time. Stated differently, it captures the amount of value-added (gross area product) over intermediate goods and services at each stage of the production process, that is, it eliminates the double counting in the Total Expenditures concept. Using the example above, the Gross Product is \$1.25 (the value of the bread) rather than \$2.50. Alternatively, it may be viewed as the sum of the value-added by the farmer, \$0.50; the miller, \$0.25 ($\$0.75 - \0.50); and the baker, \$0.50 ($\$1.25 - \0.75). The total value-added is, therefore, \$1.25, which is equivalent to the final value of the bread. In many industries, the primary component of value-added is the wage and salary payments to employees.



Definitions of Key Concepts (cont.)

- The third gauge of economic activity used in this evaluation is **Personal Income**. As the name implies, Personal Income is simply the income received by individuals, whether in the form of wages, salaries, interest, dividends, proprietors' profits, or other sources. It may thus be viewed as the segment of overall impacts which flows directly to the citizenry.
- The final aggregates used are **Permanent Jobs** and **Person-Years of Employment**. These measures reveal the full-time equivalent jobs generated by an activity, excluding those which are temporary in nature. It should be noted that, unlike the dollar values described above, Permanent Jobs is a "stock" rather than a "flow." In other words, if an area produces \$1 million in output in 1999 and \$1 million in 2000, it is appropriate to say that \$2 million was achieved in the 1999-2000 period. If the same area has 100 people working in 1999 and 100 in 2000, it only has 100 Permanent Jobs. When a flow of jobs is measured, such as in a construction project or a cumulative assessment over multiple years, it is appropriate to measure employment in Person-Years (a person working for a year). This concept is distinct from Permanent Jobs, which anticipates that the relevant positions will be maintained on a continuing basis.