



2016 Texas Rail Plan Update

Chapter 3: Potential Passenger Rail Improvements and Investments

May 2016

3.1 Potential Passenger Rail Improvements and Investments

This section summarizes potential Amtrak and intercity passenger (both higher and high-speed) improvements in the state. It also summarizes some of the issues and trends that are important factors favoring these proposals.

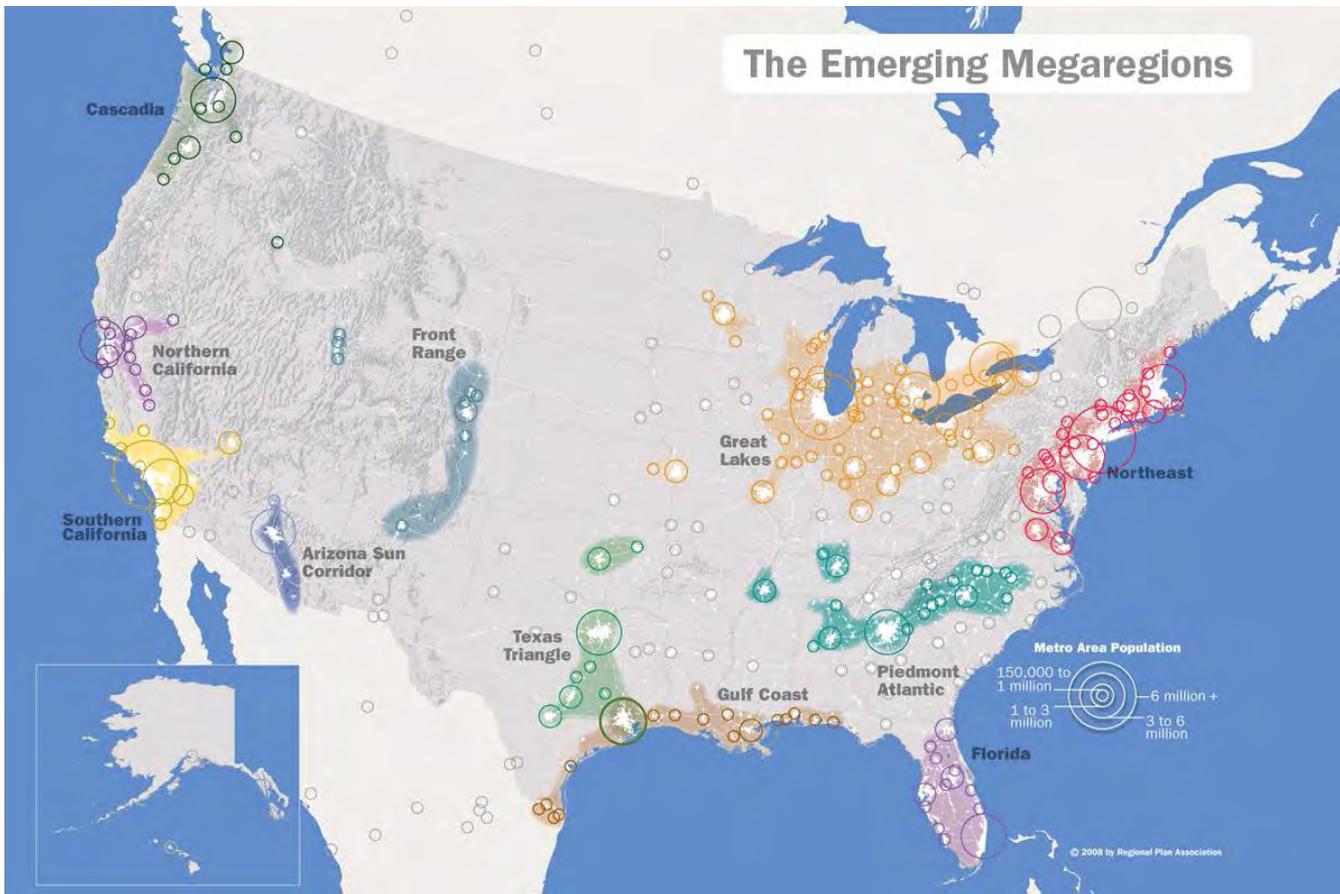
3.1.1 The Market – Population and Economic Growth

As has been outlined in previous Texas State Rail Plans, the state has strong historic population growth to become the second most populous state in the nation. Population is expected to continue to grow, reaching over 30 million by 2035. Seventy percent of the population in 2035 will live in the four metropolitan areas that constitute the Texas Triangle. Strong economic growth, especially international trade, is also expected to continue, continuing the trend of Texas outpacing national growth rates. The growth in economic activity means that transportation demand will increase faster than the rate of population increase. However, Texas's current infrastructure offers few viable alternatives to auto/highway travel, which means this growth will translate into dramatic increases in vehicle miles traveled (VMT). Despite an increase in highway capacity by over 1,000 lane miles over the last decade, congestion is still a major issue in and between the state's urban areas. Fueled by population and economic growth, and by longer trips as a result of dispersed development, VMT is expected to increase 54 percent between 2015 and 2035. This growth, almost totally focused in and around major metropolitan areas, indicates a need to consider investment in higher capacity alternatives.

Much of this increased travel demand is expected to be in daily commute to work trips and in short-distance trips (less than 600 miles). Texas contains two emerging megaregions, the Texas Triangle and Gulf Coast. A megaregion is a network of metropolitan areas linked by geography, settlement patterns, shared environment, infrastructure systems, economics and trade, shared culture and history. The Texas Triangle megaregion stretches from Dallas/Fort Worth on the north to Houston and San Antonio on the south. The Gulf Coast megaregion stretches from Brownsville to Pensacola, FL. These megaregions are shown in **Exhibit 3-1**. Three corridors connecting the cities of Houston, San Antonio and Dallas/Fort Worth link the Texas Triangle megaregion. The Houston – Baton Rouge – New Orleans corridor transits the western end of the Gulf Coast corridor. According to the 2006 *America 2050* report, most of the nation's population and economic expansion is expected to occur in the emerging megaregions. This increased traffic will strain existing infrastructure beyond capacity and require additional capacity and travel options in order to avoid gridlock.

Additional investment in lane miles and further "green field" development raises questions about the diminishing value of that strategy. At the point where new lane miles and new development is 60 – 70 miles from the city and 150 miles from the opposite side of the metro area, routine trips to a medical specialist, for example, take on the characteristics of intercity trips. And the longer trips generate more VMT's and additional traffic.

Exhibit 3-1: Megaregions of the United States in 2050



Source: America 2050, Regional Plan Association

3.1.2 Transit-Oriented Development

One of the challenges to developing intercity rail networks in Texas is the low density land use patterns which generate dispersed travel origins and destinations. Working to create more efficient development patterns would provide a strong foundation for an expanded high-volume transportation network. Given the stresses of long commutes many cities and private builders have embraced “New Urbanism” and “Transit Oriented Development.” As outlined on the New Urbanism and the Transit Oriented Development websites “New Urbanism and “Transit Oriented Development” can generally be defined as:

- **“New urbanism” or traditional neighborhood development:** Refers to creating pedestrian-friendly walkable neighborhoods radiating away from the train station on an interconnected street grid that includes a mix of development (shops, offices, housing, etc.).
- **Transit-oriented development (TOD):** Refers to higher density, mixed-use, compact development (generally in major cities) that is oriented around rail/transit stations.

The focus of these developments can be city centers, older suburbs and new town developments.

The resulting land use resembles a traditional downtown with mixed-use development featuring a central core of denser development (offices, retail, multi-family housing), radiating out to lower density development with an integrated mobility system and a more pedestrian-friendly

environment. Passenger rail stations provide major opportunities for this focused growth, especially in urban areas or new towns. These stations can function as local connection points for other feeder modes and create transportation hubs for the community. This pedestrian-friendly development pattern enables a higher number of trips to be made by transit and walking, reducing fuel use and air pollution.

Higher density, walkable cityscapes with improved transit links serve to greatly benefit passenger rail ridership and make expanded rail networks more feasible.

3.1.3 Transportation Trends Among the Millennial Generation and Baby Boomers

Several recent studies indicate a substantial change in transportation/lifestyle choices by the Millennial Generation (those born between 1983 and 2000 – today's 14 through 34 year olds). Over the decade this generation is getting their driver's licenses at a much slower pace than previous generations. Many are forgoing a license altogether – in 2011 only 67 percent of 16 to 24 year olds held a driver's license compared to a high of almost 85 percent in 1983. Among Millennials holding driver's licenses, average vehicle miles driven have dropped by 23 percent.

Researchers are not clear as to why this change is occurring; it may be the result of several factors:

1. The cost of driving has increased, both from rising gasoline prices but also from rising insurance rates. Most consumers assume that the recent reduction in gasoline prices is temporary;
2. Between 1996 and 2006 states enacted tougher driver's license requirements with additional behind-the-wheel training as well as restricted first-year driving requirements;
3. The recession, fewer jobs and lower paying jobs for young people are certainly major factors although the trend seems to be continuing even in a stronger economy;
4. Widespread electronic communication is making it easier to go "car-free." Also, socializing electronically allows the new generation to claim its own new lifestyle distinct from their parents;
5. Environmental concerns with Millennials making an effort to reduce the intensity of their carbon emissions;
6. Perhaps because they spent much of their lives being shuttled to and fro in suburban traffic, many of the Millennial Generation are choosing to live in transit-oriented neighborhoods where they can walk to their destinations. Between 2001 and 2009 biking trips have increased 24 percent, walking trips are up 16 percent and transit passenger miles are up 40 percent among Millennials.

Seniors and retirees have always been a major market for intercity rail service. This is generally the result of their more flexible personal schedules and physical issues with driving long-distances and night driving. The impact of this market can be seen in the demographic overview of current Amtrak rail routes outlined in Chapter 2 – Texas' Existing Rail System. The population growth

represented by the increase in the large Baby Boomer retiree market should positively impact future demand for intercity rail services.

These trends and growth of these markets may be driving the recent record levels of intercity motor coach ridership, Amtrak ridership and transit ridership. Continuation of these trends could represent a foundation for expanded passenger rail service.

3.2 Current Service

Current intercity passenger rail is limited both in reach (number of routes), frequencies and travel time compared to auto and air travel. These structural service deficiencies result in reduced ridership, limited revenue growth, higher public subsidies and lower public benefits. Efforts to improve the revenue/cost ratio of the existing service are critical in ensuring that the current passenger rail service in Texas will continue and makes a greater contribution to the quality of life in Texas.

3.2.1 Near-Term Improvements to Current Amtrak Service

Sunset Limited- Daily Service

The *Sunset Limited*, Amtrak's train route between Los Angeles – El Paso – San Antonio – Houston – New Orleans, has always been one of the weakest financial performers. Tri-weekly service and poor on-time performance discourage potential customers and result in inefficient operations, resulting in higher costs and lower ridership and ticket revenue. The *Sunset Limited* is a key link in nationwide matrix of city pairs served by Amtrak, which as a result of the through cars to/from the *Texas Eagle*, makes the initiative important to all of Texas not just for cities on the *Sunset Limited* route. As was noted in Chapter 2 – Texas' Existing Rail System, almost 20 percent (\$5.6 million) of the ticket revenues on the *Texas Eagle* are generated by passengers continuing their journey on the *Sunset Limited*. If the *Sunset Limited* were discontinued this loss in revenue would be immediate, resulting in the *Texas Eagle* become one of Amtrak's worst performing routes.

To address the *Sunset Limited*'s financial shortfall Amtrak undertook a broad-based study of the *Sunset Limited* and options to improve its performance, as part of the Passenger Rail Investment and Improvement Act of 2008 (PRIIA). The conclusion was that the only effective strategy was to address the fundamental cause of the problem, the tri-weekly operation of the train. The recommendation was to restructure the *Sunset Limited* and *Texas Eagle*. This restructuring would address key shortfalls in the current service, shortfalls that were raising costs through operational inefficiencies and reducing revenue by producing a product unattractive for most travelers. The major changes were:

1. Operation of the *Texas Eagle* daily from Chicago – Dallas – Fort Worth – San Antonio – El Paso – Los Angeles;
2. Operation of the *Sunset Limited* daily from New Orleans – Houston – San Antonio with a cross platform connection to the *Texas Eagle* at San Antonio for riders traveling further west.

This restructuring of the service expands the usefulness of the *Texas Eagle/Sunset Limited* network to provide the convenience of daily departures for all city pairs. As was noted in Chapter 2– Texas’ Existing Rail System, the *Sunset Limited* route serves many major cities 300 to 400 miles apart, more than many other long-distance western trains. Daily service matches customer requirements better in these markets than tri-weekly service and is expected to result in higher ridership. Daily service also brings other opportunities for ridership growth from college students, riders traveling on personal business, passengers traveling to connect to cruises, and those traveling for short-stay entertainment/recreation trips.

As a result of this improved service, the restructured *Texas Eagle/Sunset Limited* is forecasted to generate an additional 124,000 riders per year with an additional \$10 million in revenue system-wide. As a result of eliminating the inefficiencies of tri-weekly service, equipment would be used more productively; coach and sleeping car capacity increased, while the number of cars required for the service is reduced. Another indication that the proposed service is more efficient is while train miles increase 76 percent, avoidable costs (the direct costs of operating the service) are expected to only increase by 31 percent.

One reason for the likely improvement in equipment utilization is that services aboard each train will match the requirements of the passengers. The *Texas Eagle* would offer coaches, sleeping cars, a full diner and full lounge car Chicago – Los Angeles, while the daylight *Sunset Limited* would be a coach-only train with a combined diner-lounge New Orleans – Houston – San Antonio for food and beverage service. Currently both the *Texas Eagle* and *Sunset Limited* offer diners and lounges which are underutilized on the Fort Worth – San Antonio and New Orleans – San Antonio segments.

Exhibit 3-2 *Texas Eagle/Sunset Limited* Restructuring Metrics provides a summary of the expected changes that would occur as a result of this restructuring. Ridership and revenue show substantial increases and as was noted above avoidable costs (the direct costs of operating the service) rise less than the increase in train-miles and less than the increase in revenue. The revenue/cost ratio also shows positive improvement.

Exhibit 3-2: Texas Eagle/Sunset Limited Restructuring Metrics

| Route | FY 2009 Ridership | FY09 Total Rev (Mil) | FY09 Avoidable Costs (Mil) | Revenue/Avoidable Cost Ratio |
|---------------------------|-------------------|----------------------|----------------------------|------------------------------|
| Baseline Sunset/Eagle | 339,200 | \$31.1 | \$58.3 | 53.3% |
| Restructured Sunset/Eagle | 442,300 | \$38.80 | \$70.50 | 55.0% |
| % Change | 30.4% | 24.8% | 20.9% | 3.2% |

Source: PRIIA Section 210, FY10 Performance Improvement Plan Sunset Ltd/Texas Eagle, September 2009, 2010 Amtrak Monthly Performance Report, Sept 2009, 2110 Amtrak Train Earnings

When approached with the proposal to change the *Sunset Limited's* frequency, Union Pacific Railroad (UP) was reluctant to approve the operation given the level of freight traffic on the train's route and the ongoing double-track project between El Paso and Colton, CA. UP also indicated that daily operation of the *Sunset Limited* would require \$750 million in capital investment. Currently the double-track project between El Paso and Colton is near completion; at this point another request for a daily *Sunset Limited* may be in order.

Heartland Flyer- Improved Connectivity and Cost Savings

The *Heartland Flyer* primarily serves travel from Oklahoma and Gainesville, TX to Fort Worth, TX. However, the large Dallas market could add additional riders with improved connections. Currently the only option available on Amtrak.com for travel from Oklahoma and Gainesville points to Dallas is a connection to the *Texas Eagle*. This connection has a long layover, especially for northbound travelers (four hours) and introduces reliability issues, especially burdensome for a short-distance trip. Utilizing existing Trinity Rail Express (TRE) trains reduces this layover and would improve the reliability of the connection. But to most travelers this superior connection is invisible. A Thruway ticketing agreement would allow connecting TRE schedules to be displayed on Amtrak.com and through fares purchased. *Heartland Flyer* conductors could scan the Dallas - Fort Worth boarding passes for revenue collection for payment to TRE. The Dallas - Fort Worth boarding pass for the specific TRE train and date of travel would be the proof of payment for travel on TRE. On Sundays, when TRE does not operate, a chartered motor coach can be operated Fort Worth - Dallas to facilitate the connection.

Another service that can be offered to *Heartland Flyer* riders is a transit transfer. With this program conductors have special transfers valid on participating transit agencies for travel by the train rider beyond the train station. The *Capitol Corridor*, which pioneered this program by working closely with local transit operators, has agreements with eleven Northern California transit agencies. Transit agencies view their logos and internet links on the *Capitol Corridor* website and mention in the timetable as a marketing program, creating awareness and trial usage among a new group of potential riders.

Caltrans Division of Rail has helped to support initiatives such as Thruway ticketing programs and other ticket honoring agreements by facilitating negotiations between operators and assuming the revenue risk if there are problems with the implementation of the service.

As was noted in Chapter 2– Texas’ Existing Rail System, effective with FY 2014 (October 2013), there were changes in cost methodology. PRIIA mandated that states bear a higher percentage of operating costs for passenger rail routes of less than 750 miles. This resulted in a substantial increase in costs for operating the *Heartland Flyer*. While the requirements of the freight railroads over which the train operates limit the operating crew to Amtrak, several other states have reduced their operating costs by purchasing their own equipment. A capital grant would be required, but there is often more flexibility in obtaining one-time capital grants compared to yearly operating grants. California and Washington purchased new equipment, while North Carolina has had great success with used equipment rebuilt to its specifications. Indiana leases equipment from a private rail operator who also maintains the equipment. Equipment owned by Washington State and North Carolina are maintained by private-sector contractors. Maine and Indiana have reduced costs for on-board food and beverage service by contracting with the private sector for on-board service. Equipment owned by Oklahoma and Texas could also create some potential synergy between the *Heartland Flyer* and TRE. With another set of rebuilt or new equipment the *Heartland Flyer* could be extended to Dallas and maintained at the TRE maintenance facility. Between Fort Worth and Dallas the *Heartland Flyer* would be operated with TRE crews, honor TRE tickets and operate as a limited stop TRE Express between the two cities.

Station Improvements

As was noted in Chapter 2– Texas’ Existing Rail System, many local communities, local developers and rail supporters have obtained funding for new or refurbished stations in Texas. However, other stations have state-of-good repair needs and are not fully compliant with the Americans with Disabilities Act (ADA) requirements. While Amtrak is focusing on addressing ADA requirements, its budget is not sufficient to address these accessibility requirements in a timely manner. TxDOT should encourage and help facilitate local communities in applying for federal, state, local and private funding to address state-of-good repairs and ADA needs at their stations.

Promotion and Support of Current Service

Texas can also help coordinate or assist in efforts to improve customer satisfaction and revenue performance by enhancing the quality of existing passenger rail services. Any initiative that generates ridership and revenue improves the financial performance of the rail service and aids in sustaining and expanding rail passenger service in Texas.

For example, the promotion of existing rail service is the first step in building awareness and usage of the rail mode. Noting the availability of Amtrak service and offering a link to the Amtrak website on state and local travel websites is a key first step in promoting rail service. Joint promotions can be developed that link with Amtrak, local transit carriers, hotels and attractions. All of the participants in this program work together to provide detailed information on how to visit and enjoy Texas cities by rail. An example of such a coordinated program is Santa Barbara, CA’s “Car-Free” tour program. The program developed an information and tour package that coordinates hotels,

attractions, ground transportation, and key transit routes, all designed to allow customers to utilize the train for a relaxing visit to Santa Barbara without the need for an automobile when they arrive. Several other cities served by California's state-supported rail network have also adopted The "Car-Free" promotion concept.

As has been done in North Carolina and California, Texas could help coordinate the development of a station volunteer program. These station volunteers, working at both staffed and unstaffed stations, offer personalized service and information as travelers make their journeys. They can also assist passengers and provide information about passenger services, the train route, ground transportation and area attractions. While some Texas stations have caretakers at unstaffed stations that open and close the station, the station volunteer program provides organization and training for an expanded and more formal level-of-service. North Carolina's program, which also includes on-train hosts, is part of a multi-faceted effort to offer a welcoming, informational and reassuring presence when boarding or riding its trains.

The Texas Eagle Marketing and Performance Organization (TEMPO) is an example of a grassroots, community-based effort designed to improve the ridership, revenue and operating performance of a transportation service. Stakeholders representing local elected officials, downtown business, community leaders, Amtrak employees, train riders and rail advocates focused on and in fact saved the *Texas Eagle* from discontinuance. The *Sunset Limited* could clearly benefit from such a grassroots community effort on its behalf, especially in the effort to improve its performance with daily operation.

Three passenger rail routes that pass through Texas offer programs as part of the National Park Service's Rails and Trails program. This program has been adopted as a major public outreach program by the National Park Service (NPS). Utilizing NPS ranger staff for oversight, training and management, NPS volunteer docents on the trains provide programs on 10 Amtrak long-distance train routes. These programs provide Amtrak passengers with information and discussions about the scenery and historical sites that the long-distance trains pass, which help transform a long-distance train trip into a "Land Cruise." TxDOT can look for strategies to assist the NPS in maintaining this program and increasing the frequency of the presentations.

Thruway Bus Service

Thruway bus connections offer coordinated schedules, through fares and guaranteed connections to/from trains. Thruway connecting bus routes add additional cities to the passenger rail network and provide vital service to transit-dependent residents in rural areas. They have proven successful in generating incremental ridership and revenue and can build traffic for future rail service. While routes with the highest traffic have dedicated charter motor coaches, successful Thruway bus services also utilize regularly scheduled motor coaches, carrying both rail and bus passengers "mixed mode." There are several Thruway bus and interline bus routes serving Texas. TxDOT should facilitate partnerships between the motor coach industry and Amtrak to create additional intercity transportation routes for rural Texas communities, some of which lost intercity motor coach and airline service with the market-based restructuring of the airline and intercity motor coach

industries. A broad based study with input from rail service stakeholders plus discussions with motor coach operators could be a first step in this effort.

3.2.2 Potential Conventional Intercity Passenger Rail Service Expansion

There are a number of route proposals, with studies completed or ongoing for enhanced intercity passenger rail service in Texas. Given Texas' diverse economy and strategic position, these forward-looking actions are designed to lay the foundation for additional rail service to accommodate future economic and population growth.

Heartland Flyer Route Extensions

While not dealing with rail service within Texas, the state would be impacted by proposals being studied by Oklahoma and Kansas on northward extensions and additional frequencies along the *Heartland Flyer* route. A route extension would make additional destinations available to Texas residents, while additional frequencies would make train travel more convenient. The proposed extensions/additional frequencies under consideration are:

1. Extension of the *Heartland Flyer* to Newton, KS, connecting to the *Southwest Chief* for travel east or west;
2. Add a daylight frequency Fort Worth to Kansas City which, combined with the *Heartland Flyer*, would provide two daily frequencies between Fort Worth and Oklahoma City;
3. Instead of a daylight frequency the new frequency would be an overnight between Fort Worth and Kansas City. The *Heartland Flyer* would continue to operate unchanged;
4. A separate frequency between Kansas City and Oklahoma City.

No action has taken place regarding these proposals.

Potential or Possible Additional Routes Considered

Dallas/Fort Worth to Shreveport/Bossier, LA

Championed by passenger rail advocates in East Texas, TxDOT, working with Amtrak, analyzed the ridership and ticket revenue of a proposed rail service between Fort Worth and Shreveport/Bossier, LA (190 miles). The proposed service would use conventional passenger trains with a maximum speed of 79 mph. Two daily round-trips would be operated, making up to seven intermediate stops. Estimated order-of-magnitude capital requirements and operating costs were developed by Amtrak while UP provided rail line capacity modeling. The study determined that it was not cost-effective to provide rail service solely between Dallas and Shreveport at this time.

Dallas/Fort Worth to Meridian, Mississippi

As part of an effort to strengthen southwest and southern rail links to the Northeast and also to begin the creation of a hub in the Dallas/Fort Worth Metroplex, Amtrak analyzed the potential of operating a leg of Amtrak's New York – New Orleans *Crescent* from Meridian to Fort Worth. This service would greatly improve passenger rail accessibility from Dallas/Fort Worth to other urban centers in the southeastern U.S. such as Atlanta and also to East Coast destinations such as

Washington, D.C. TxDOT also worked with Amtrak to develop a portion of this route, which was being promoted by passenger rail advocates in East Texas, who wanted to see a route developed between Dallas and Shreveport, Louisiana (190 miles). While the ridership and ticket revenue of the proposed Meridian – Fort Worth leg of the Crescent was found to be very positive, the initiation of service would require substantial rail capacity expansion. As a result it was determined that providing service was not currently cost-effective.

Fort Worth to Denver, Colorado

Several West Texas communities have expressed support in the past for passenger rail service in the Panhandle of Texas. The potential service, currently dubbed the “Caprock Express,” would operate from Fort Worth through the cities of Abilene, Lubbock, and Amarillo in-route to La Junta, Colorado Springs, and Denver, Colorado. The 840-mile distance of this route would make this a long-distance service. This route is a major BNSF Railway (BNSF) coal corridor with substantial freight traffic; as a result rail line capacity would be a major issue.

San Antonio to Laredo to Monterrey, Mexico

As part of their Network Growth Strategy published in 2000, Amtrak considered adding passenger rail service between San Antonio and Monterrey, a route of approximately 375 miles. Amtrak had previously held discussions with Mexican authorities concerning alignment and right-of-way issues. Monterrey is a leading industrial and corporate center in Mexico with strong historic, economic, and social ties to Texas. No further action has been taken by Amtrak regarding this proposal. However, TxDOT is currently considering various levels of passenger rail service along this route as part of its Texas-Oklahoma Passenger Rail Study.

Southwest Chief Re-Route through Amarillo

The proposed re-route of the *Southwest Chief* via Amarillo looks unlikely. Cities along the route in Kansas, Colorado and New Mexico have undertaken a strong grassroots effort to keep the *Southwest Chief* on its current route. This grassroots coalition successfully applied for and has been awarded two TIGER Grants totaling \$27.5 million which was matched with almost \$19 million in local and railroad funds. These funds are for repairing and upgrading 94 miles of the 158 miles of jointed rail that are life-expired and need to be replaced. Efforts to obtain additional capital grants for other sections of life-expired infrastructure continue. BNSF, perhaps with a new appreciation of the value of redundant mainline capacity after last year’s service problems between Minneapolis, MN and Spokane, WA, has been active in maintaining non-life-expired assets and replacing life-expired infrastructure needed for its freight service. They have also provided commitments of capital funds to match Federal grants. A re-route via Amarillo would likely require capacity investments equal to or exceeding the amount needed to keep the existing rail line via Raton Pass in service as a passenger line. Also, all the funding would be needed and construction completed before the re-route could take place. Given that the BNSF is still maintaining the line for freight service, the Raton Line upgrades can be done incrementally over several years.

3.3 Expansion Related Infrastructure Issues

A critical factor in all the above proposals is rail line capacity. Rail line capacity is also the underlying cause of the slow average speeds and unreliable nature of current intercity service.

These slow average speeds, for the most part, are not caused by poor track conditions or restricted alignments, but are a reflection of a capacity constrained network with frequent meet delays and delays due to train congestion. Additional rail line capacity will need to be constructed for both the growing rail freight market as well as for any additional passenger rail service. In some cases former mainlines may need to be upgraded as bypass routes or new bypass routes are constructed. Key highway/rail crossings need to be separated with parallel crossings closed in order to create a more reliable, more fluid rail line that can be operated without concerns regarding the blocking of highway crossings.

In planning any passenger rail expansion, provision for rail freight growth must also be included. The corridor improvement strategy must not only improve and add capacity for the proposed rail passenger service, but also identify how freight service is maintained and freight capacity improved as part of the investment. An additional issue for the freight railroads is that passenger investment undertaken to allow the expansion of passenger rail service may consume valuable right-of-way that results in future privately funded freight capacity investment being dramatically more expensive.

3.4 Enhanced Intercity Passenger Rail Service

Texas, and the Texas Triangle in particular, are at the nexus of two federally designated high-speed rail corridors: the Gulf Coast Corridor (Houston - New Orleans- Mobile), and the South Central Corridor (Tulsa – Oklahoma City – Dallas/Fort Worth – Austin – San Antonio and Little Rock – Texarkana – Dallas), as shown in **Exhibit 3-3**.

Exhibit 3-3: Federally Designated High Speed Corridors



Source: Federal Railroad Administration, 2010

Given the strong population and economic growth in Texas, higher and high-speed rail are being considered to provide the increase in transportation capacity needed to accommodate future growth (see next page for definitions). High-speed passenger trains that run frequently are competitive with air travel between urban regions 200 to 500 miles distant from each other. The motivation and projected need that prompted the state of Texas to study high-speed rail (HSR) in the 1980's and 1990's still exists. Higher speeds, and passenger amenities unavailable to auto and air passengers, differentiate HSR from existing intercity passenger service. High-speed rail expands travel options because it is faster than auto travel and more convenient than flying.

Improved rail service generates significant consumer benefits. Travelers reap direct benefits through reduced travel time and expense, reduced stress, the ability to work while traveling, increased mobility and an additional transportation choice. Indirect benefits to the general public as a whole include freeing up capacity for more efficient air and highway systems, improved energy efficiency, and reduced emissions. It also shifts auto drivers to a significantly safer travel mode, thus reducing accident medical costs. The reduced travel times associated with improved rail service can increase economic activity by creating larger regional markets. In addition to these benefits, enhanced rail service can act as a catalyst for development and can transform the urban landscape.

3.4.1 *Enhanced Intercity Passenger Rail Service Definitions*

The National HSIPR Strategic Plan published by the U.S. Department of Transportation and FRA contains strategy, definitions, and guidelines for development of passenger rail corridors across the country. In the near term, this plan proposes investment in infrastructure, equipment, and intermodal connections that will lay the foundation for an efficient high-speed passenger rail network of corridors 100 to 600 miles in length.

The plan offers the following definitions used in identifying corridors:

- **HSIPR – Core Express:** Frequent, express service between major population centers 200–600 miles apart, with few intermediate stops. Top speed of at least 150 mph on completely grade-separated, dedicated rights-of-way (with the possible exception of some shared track in terminal areas). Intended to relieve air and highway capacity constraints.
- **HSIPR – Regional:** Relatively frequent service between major and moderate population centers 100–500 miles apart, with some intermediate stops. Top speeds of 110–150 mph, grade-separated, with some dedicated and some shared track (using positive train control technology). Intended to relieve highway and, to some extent, air capacity constraints.
- **HSIPR – Emerging:** Developing corridors of 100–500 miles, with strong potential for future HSIPR regional and/or express service. Top speeds of up to 90–110 mph on primarily shared track (eventually using positive train control technology), with advanced grade crossing protection or separation. Intended to develop the passenger rail market and provide some relief to other modes.
- **Conventional Rail:** Traditional intercity passenger rail services of more than 100 miles with as little as one to as many as 7–12 daily frequencies; may or may not have strong potential for future high-speed rail service. Top speeds of up to 90 mph, generally on shared track. It is intended to provide travel options and develop the passenger rail market for further development.

3.4.2 *National and State Macro Planning Activities*

In an analysis of the designated high-speed rail corridors (“High-Speed Rail in America - America 2050”) by the Regional Plan Association in 2011 using factors such as population, employment composition and concentrations, transit accessibility and the air travel market, each corridor was scored according to its potential. Corridors were ranked on an additive scale using the factors noted above. **Exhibit 3-4** compares the scores of Texas corridors and those in the Northeast and California.

Exhibit 3-4: Ranking*
Speed Rail Corridors

of Potential U.S. High-

| Corridor | Additive Score |
|-----------------------------|----------------|
| New York - Washington | 20.2 |
| New York - Boston | 19.9 |
| San Francisco - Los Angeles | 18.0 |
| Dallas - Houston | 16.1 |
| Dallas - Austin | 14.9 |
| Dallas - San Antonio | 14.8 |
| Dallas - Oklahoma City | 14.4 |
| Houston - San Antonio | 13.9 |
| Houston - Austin | 13.8 |
| Houston - New Orleans | 11.3 |
| Dallas - Little Rock | 10.7 |

* Additive Scale

Source: High-Speed Rail in America – America 2050

Lower scores for Houston – New Orleans and Dallas – Little Rock suggest that near-term development may not be a priority. One factor limiting the scores of the Texas corridors compared to other corridors, despite significant population and employment, is Texas’s decentralized pattern of development and a limited transit network. Continued expansion of transit networks combined with Transit Oriented Development would lay the foundation for the success of high-speed rail.

To help evaluate potential corridors, the Texas Transportation Institute (TTI) at Texas A&M University and the Center for Transportation Research (CTR) at the University of Texas at Austin developed a set of criteria to evaluate high-speed passenger rail investment in the state.

The TTI’s May 2009 report titled “Potential Development of an Intercity Passenger Transit System in Texas” used 15 criteria to evaluate potential city-pair corridors for prioritizing rail investments in Texas. The evaluation criteria in the report considered the population and demographics, travel demand, and the transportation capacity of the 18 potential corridors. From those criteria, TTI ranked the corridors using different evaluation methods. In both methods, the Dallas/ Fort Worth to Houston and Dallas/Fort Worth to Austin/San Antonio corridors were deemed preferred corridors. The TTI report also discussed the need to determine the best routes.

The Dallas/Fort Worth–Houston city-pair is currently not a designated high-speed-rail (HSR) corridor, whereas the Dallas/Fort Worth–San Antonio city-pair forms the southern part of the South Central designated HSR corridor. The TTI report also noted the need for further study to determine the most efficient routes.

The Center for Transportation Research’s evaluation criteria focuses more on examining how potential city-pair corridors meet the goals and optimize the benefits of providing passenger train service in Texas. CTR’s guidance to planners focuses on travel demand, transportation capacity (all

modes), travel time, intermodal connections, routing that optimizes rail technology and the market segment, integration into metropolitan and statewide transportation planning, creation of transportation options, environmental benefits and land-use.

Research conducted by private entities and the state and federal government the last 30 years predicted that a system of faster trains serving the state's largest cities would support significant passenger volumes. In 1989, the Texas Legislature created the Texas High Speed Rail Authority (THSRA) as a separate state agency to determine whether high-speed rail in Texas was feasible. THSRA was to determine the best-qualified applicant for award of a franchise to design, build, and operate a high-speed rail service in the state. THSRA awarded a franchise to the Texas TGV Corporation, but the company was unable to secure financial backing. The THSRA was abolished in 1995.

Four additional proposals/studies targeted at key segments of the Texas Triangle have been authored since the Texas TGV effort. All the proposed routes studied serve the Texas Triangle cities of Austin, Dallas/Fort Worth, Houston and San Antonio. The studies indicated that operating revenues would exceed operating expenses.

3.4.3 Current Situation and Issues of Public Costs/Benefits

The strong market potential in Texas combined with favorable terrain has resulted in renewed interest by the private sector in developing high-speed rail in Texas. Adding to the momentum is the intense competition between vendor consortiums to build high-speed rail in the United States. However, while this private sector interest may seem to simplify the process for public stakeholders, new issues arise that will need to be addressed. Some of the issues revolve around finance, some around public benefits, while others around the type of network to be built. Public stakeholders should work with the private sector to define these issues and determine how public stakeholders should address these issues early in the high-speed rail development process.

High-speed rail is more than just a system of tracks and new equipment. Maximizing public benefits is a key facet of most publicly funded transportation systems, but a challenge with a privately funded system. Public benefits are often diffuse (i.e., reduced traffic congestion, less air pollution, increased economic activity, increase property values, etc.); making it impossible for the private sector train operator to capture revenue from these benefits. This may be especially critical and challenging in terms of station location. The last few miles to downtown will be expensive, time consuming, and may involve tunneling and contentious property acquisition. A developer will likely prefer a large, lower cost brown field site, near downtown, with good auto access and potential for long-term development.

However, stakeholders who advocate multimodalism see high-speed rail as a key facet of the larger transportation system that creates an alternative to driving. These stakeholders see transit hubs offering multimodal connectivity as the best station locations. Other stakeholders who advocate TOD look at key criteria such as population and economic activity within one-half mile of the train station and the potential of TOD. These stakeholders see high-speed rail as a catalyst to foster TOD. City centers generally offer this potential.

With the challenge of maximizing public benefits while also assuring an economically viable private high-speed rail enterprise, local stakeholders could seek creative public-private partnerships or value-capture funding to extend the high-speed line to the city center transit hub. Alternatively, connections can be minimized by extending major transit/commuter lines to the new high-speed rail station to create a major transit hub. This strategy, a brownfield station site, near downtown with seamless transit connections and TOD, is common in rail systems (i.e., Back Bay Station in Boston).

Another factor is railroad freight capacity. Several of the improvements in other states have been higher speed intercity passenger rail with the incremental improvement of a joint passenger/freight line. However, unlike states in the Northeast or Midwest which benefited from a legacy right-of-way infrastructure built for an era of multiple passenger, mail and express frequencies, Texas freight railroads are generally single-track lines straining under the huge growth in freight traffic. As a result, in order to operate a three or four passenger frequency corridor, the freight railroads may require the construction of many miles of second or third track. So at a huge public cost the traveling public receives three or four frequencies operating at 79 mph and sharing the track with long heavy freight trains. It should be noted that all freight corridors are different and all passenger markets are different, so there is also the possibility of a viable higher speed passenger service on a particular mixed-traffic corridor, but for other corridors with higher potential the amount of capital required for an incremental upgrade would, if invested in a private/public partnership, allow the corridor to see high-speed rail largely built by the private sector.

3.4.4 Current HSIPR Initiatives

TxDOT prepared and submitted planning fund applications for three corridors: Dallas/Fort Worth to Houston; Oklahoma City to South Texas; and Austin to Houston. TxDOT is currently in the process of advancing two potential HSIPR corridors within Texas: Oklahoma City to South Texas and Dallas to Fort Worth. Dallas to Fort Worth was once part of a single study, Fort Worth to Houston, but the study was split into two separate studies—Dallas to Fort Worth Core Express, being conducted by TxDOT, and Dallas to Houston High-Speed Rail EIS which is being funded by Texas Central Railway (TCR). These studies are being coordinated with local governments, MPO's and local transportation districts.

Dallas to Houston

TCR proposes an entirely privately funded high-speed passenger rail service between Dallas and Houston with no state or federal funds for the EIS study, the development, construction or operation of the service. The FRA is preparing the EIS in accordance with the requirements of the National Environmental Policy Act (NEPA). The NEPA process will establish the purpose and need for the service and evaluate potential social, economic, and environmental impacts of the preferred alternatives.

The proposed Dallas – Houston high-speed rail corridor generally parallels I-45 to the west of the interstate. The rail line would be a privately constructed double-track electrified rail line approximately 240 miles long from Dallas to Houston. With operating speeds between 180 and

205 mph, the rail line would, by regulation and necessity, be fully sealed and grade separated from any intersecting roads or railroad. Equipment used would be N700-1 Tokaido Shinkansen, the latest variant of Japanese high-speed rail technology. Travel times between Dallas and Houston would be 90 minutes, with at least hourly service and additional frequencies during the peak period. Service would increase as traffic increases. One intermediate station is being studied. In Dallas, station locations have been narrowed to two downtown options, both of which could be connected with the Dallas to Fort Worth high-speed rail project. In addition, TCR has signed an agreement with a local real estate developer on the station area development. At this point the preferred location for the Houston station is still under study. Ridership and revenue estimates are considered proprietary at this time.

Over the past three years TCR developed a set of alternative routes with the following goals: safety; connectivity; minimization of dislocation of existing facilities and to limit right-of-way requirements; minimize construction impacts and environmental impacts; minimize construction costs; and develop an alignment that maximizes operating speed and meets travel time goals. These alternatives became the baseline for FRA's Corridor Alternatives Analysis (issued August 10, 2015). The alternatives analysis studied various transportation alternatives to high-speed rail and the proposed routes for the Dallas – Houston high-speed rail. This was done to determine which route option met the TCR's requirements and resulted in the least impact on the environment and existing facilities. The FRA found that the Utility Corridor, an alignment parallel to high-voltage utility lines for most of its route (approximately 70 percent), would meet all of TCR's purpose and technical requirements and should be carried forward as part of the EIS process. Also planned is a mid-route Brazos Valley station located between Huntsville and Bryan/College Station serving Grimes County. Other alignments, BNSF, UP RR and I-45 Greenfield corridors, would be retained to provide key segments where the utility corridor is not available. The next step is the more detailed route identification within the Utility Corridor in the alignments screening process. Completion of the EIS will result in a Record of Decision (ROD) for the preferred alternatives for the service between Dallas and Houston. A recent study funded by TCR and conducted by Insight Research estimated that the proposed high-speed rail system construction and operation would generate approximately \$36 billion in ancillary benefits to the Texas economy. These benefits would come from additional jobs, tax revenue and additional private development as a result of the project. In October 2015 TCR entered into an agreement for engineering and pre-construction work. Construction is expected to commence in 2017.

Dallas to Fort Worth Core Express

As was noted above, the Dallas to Fort Worth segment of the Fort Worth to Houston HSIPR grant was split off so that the Dallas – Houston EIS could be carried forward as a private venture. Since the project was split into two projects, North Texas stakeholders have been strong advocates of Dallas – Fort Worth Core Express to link the entire Dallas/Fort Worth region with the high-speed system at Dallas.

In May 2011, TxDOT was awarded a \$15 million American Recovery and Reinvestment Act of 2009 grant from the FRA for the Preliminary Engineering and NEPA work for new core express service

(high-speed rail) in the 35-mile Dallas-Fort Worth corridor. In September 2014 USDOT issued a grant to TxDOT to facilitate the preparation of an EIS by FRA for the Dallas – Fort Worth Core Express. In an added effort to maintain momentum for the project, the Regional Transportation Council-North Central Council of Governments has allocated \$1.5 million over the next three years (\$4.5 million total) for additional planning, data gathering and engineering design. The proposed Dallas – Fort Worth Core Express ties together two other proposed high-speed rail lines: Dallas – Houston and Oklahoma City – Fort Worth – San Antonio.

One of the key priorities for North Texas advocates and the North Central Council of Governments is that Dallas – Fort Worth Core Express utilize the same Dallas station as TCR's Houston service in order to maximize connectivity. Ideally a pooling agreement could be negotiated allowing through TCR service to Fort Worth offering a one-seat ride Fort Worth to Houston.

The state and the FRA are considering two corridor options: one following the TRE rail line, and a second paralleling I-30 from Fort Worth to Arlington and then joining the TRE right-of-way. Completion of the EIS study should result in a ROD for the preferred alternatives for the service between Dallas and Fort Worth. This study is anticipated to be completed by the end of 2017.

Oklahoma City to South Texas

TxDOT, in cooperation with the Oklahoma Department of Transportation, is evaluating a range of passenger rail service options in an 850 mile corridor from Oklahoma City to South Texas in the Texas-Oklahoma Passenger Rail Study (TOPRS). This study is being undertaken as follow-on to several studies outlining the congestion and growth along the I-35 corridor (VMT growth +71 percent 2005 - 2035). One segment of the corridor, Dallas/Fort Worth to San Antonio, is the most densely populated and fastest-growing corridor in Texas. In addition, I-35 is one of the main truck routes from the US to Mexico. Also many I-35 residents have indicated a strong dissatisfaction with congestion and traffic at key points on the road.

The study is funded through an FRA grant (\$5.6 million) and by TxDOT (\$1.4 million), for the preparation of an Investment Plan consisting of a Service Development Plan and Service Level (Tier 1) Draft EIS for the Oklahoma City to South Texas corridor, extending through Dallas/Fort Worth, Austin and San Antonio.

The purpose of the study is to evaluate alternatives to provide higher speed passenger rail service to meet future intercity travel demand and to improve rail facilities, reduce journey times and improve connections with other public transit services.

The TOPRS Draft EIS process commenced in 2012 and is expected to be completed by the end of 2015. It will document the costs, benefits, and impacts of rail service alternatives compared to a no-build alternative in a service-level EIS. TxDOT and the study team conducted public and agency scoping meetings in March and April 2013 and have compiled all comments into a scoping report. The Draft EIS will be complete and available for review and comments by the end of 2015. Once a preferred alternative is identified, TxDOT will prepare a Final EIS that responds to all comments received, mitigation measures and a service development plan.

Austin to Houston

This corridor lies roughly parallel to US 290 and incorporates the intermediate cities of Bryan/College Station, Giddings, Brenham, and Hempstead. The Austin to Houston Passenger Rail Study, completed in December 2011, analyzed the feasibility of implementing passenger rail service between Austin and Houston, including possible service to Bryan/College Station. This analysis consisted of identifying the characteristics of existing rail infrastructure and operations in the studied corridors, analyzing potential alternative alignments for passenger rail operations and determining required infrastructure and impacts for potential passenger rail service in the area.

Potential alignments included routes between Austin and Hempstead (direct), Austin and Hempstead via Bryan/College Station, Austin and Hempstead via Giddings and Bryan/College Station, and Austin and Hempstead via Brenham and Bryan/College Station. A connection to the proposed Gulf Coast Rail District's commuter rail line undergoing independent analysis at Hempstead was assumed for the end limits of the alignments.

The alignment alternatives were analyzed for environmental fatal flaws and the flaws in the passenger rail alignments. These were identified in exhibits and used to determine an alignment to be carried forward for railroad operations modeling. Lastly, a list of corridor requirements, based on the alternative and additional infrastructure defined through RTC modeling was prepared for passenger rail implementation.

The intercity passenger routes modeled include stops at rail stations in Austin, Elgin, Giddings, Brenham, Hempstead and College Station. In the absence of a ridership analysis study, station locations were determined to be the areas with the greatest population along each corridor.

San Antonio – Monterrey

This segment is proposed to serve the growing market between Texas and Mexico. This leg is part of the overall Oklahoma City to San Antonio I-35 study. Currently, TxDOT is considering the possibility of coordinating with the Mexican government to provide passenger rail service between the two countries. Two Oklahoma City – San Antonio route alternatives (S4 and S6) have the option of being extended to Monterrey. One of the challenges is the lack of protocols for trans-border rail passenger service.

Extension of South Central Corridor from Little Rock to Memphis

As part of efforts to modify and extend the current Federally Designated High-Speed Rail Corridors, it has been proposed that the South Central Corridor be extended from Little Rock to Memphis. Given the population of Memphis (1.3 million), this proposed extension would seem to have merit once the core network is constructed and the leg to Memphis can leverage the large number of destinations served by the core South Central Corridor network.

Houston – Beaumont – Baton Rouge – New Orleans

This route is the western leg of the Gulf Coast High-Speed Rail network. The route would originate at New Orleans Union Passenger Terminal and have intermediate stops at Kenner (New Orleans International Airport), South Baton Rouge, Baton Rouge, Opelousas or Lafayette, Beaumont and

end in Houston. HSIPR – Emerging is envisioned with up to six daily round-trips at speeds up to 90 mph. The route would primarily operate on upgraded freight lines with additional capacity added.

As part of the *Gulf Coast High-Speed Rail Corridor Plan, Lake Charles to Meridian Corridor Development Plan* (sponsored by the Southern Rail Commission), ridership and ticket revenue forecasts for the New Orleans-Baton Rouge-Lake Charles-Houston corridor were estimated by AECOM Consult. Forecast assumptions included improved running times and up to six daily frequencies. The forecast also included ridership and ticket revenues for additional commuter schedules between Baton Rouge and New Orleans. These commuter-oriented trains make additional stops between Baton Rouge – New Orleans.

Based on the study forecasts it appeared that there would be demand for a more frequent higher speed rail service in the New Orleans – Baton Rouge – Lake Charles – Houston corridor.

Lone Star Rail District

Delays from traffic congestion caused by high single-occupant automobile use and unpredictability from accidents and weather, coupled with a lack of competitive transportation alternatives and injuries and deaths along the Austin-San Antonio I-35 corridor, point to a need for a more efficient and safer form of transportation. VMT totals on this corridor are predicted to rise substantially through 2035, further exacerbating these problems.

The Austin–San Antonio Intermunicipal Commuter Rail District (ASA-ICRD) was formed in November 2002, charged with providing a safer, more efficient alternative. The district formally changed its name to Lone Star Rail District (LSRD) in October 2009 and named the future rail service LSTAR. The Board includes 21 members representing eight local cities, four counties, six transit agencies and MPO's one college and two members of the general public (appointed by the Texas Transportation Commission).

The locally preferred alternative (adopted by the San Antonio and Austin MPOs in 2005) is a 117-mile regional passenger rail system located in the existing UP rail corridor for most of its length. Fifteen stations are proposed along the route, which is anchored by the Austin and San Antonio metropolitan areas with potential additional stations in Schertz, New Braunfels, San Marcos, Kyle/Buda, Round Rock, and Georgetown (**Exhibit 3-5**). A sixteenth additional station in south San Antonio will be studied in the environmental clearance process.

Proposed service includes both local and express trains. Overall trip time for the express trains between downtown Austin to downtown San Antonio, with stops in San Marcos and New Braunfels, is planned at 75 minutes. Planned service also includes up to 32 trains per day, and the service will operate at up to 90 mph in some places at some point in the future. LSRD has estimated that the rail line would carry between 1.4 and 5.0 million passengers a year by 2030.

Significant technical work has been completed on the proposed passenger rail project, including conceptual engineering, alternatives analysis, station location studies, station economic impact analyses, capital and operations-and-maintenance cost estimates, service plans, joint operations

planning, ridership studies, and financial and economic benefit studies. Environmental studies are continuing with the Final Public and Agency Scoping Report released in June 2015.

Cooperation with UP is critical, because the route uses the existing UP corridor which has significant freight traffic. Because of the level of freight traffic a freight bypass is a critical part of this proposal. LSRD executed agreements with UP for initial feasibility studies on the freight bypass in 2009 and entered into a Memorandum of Understanding in October 2010 further refining the studies and potential terms and conditions. In 2012, LSRD completed alternative alignments analysis on the freight bypass and will advance three alignments in the federal environmental review process. LSRD is combining the passenger rail system and the freight bypass in one Environmental Impact Statement (EIS) that began in October 2014. Completion of the EIS is expected by October 2017. The passenger rail route and the freight bypass corridor (Purple shading) are shown in **Exhibit 3-5**.

Exhibit 3-5: Proposed Route and Stations for LSTAR



Source: Lone Star Rail District

The project received \$8.7 million in general revenue for FY 2010–2011. The project has been awarded federal metropolitan mobility funds from Capital Area Metropolitan Planning Organization (CAMPO) in the amounts of \$5 million in both FY 2009 and FY 2010, and \$10 million over FY 2013, FY 2014 and FY 2015. The CAMPO funds are being used to conduct the federal environmental process. The environmental study, funded by TxDOT and CAMPO, began in October 2014 and is expected to be completed by October 2017.

LSTAR's implementation is expected to benefit the economy, users of I-35, residents of the Austin/San Antonio metro area, and faculty, staff, and students of the corridor's many universities (such as the University of Texas at San Antonio, Texas State University in San Marcos, St. Edward's University, Huston-Tillotson University, and The University of Texas at Austin).

Dallas-Fort Worth Hub

As part of a strategic study in 1999, Amtrak developed the concept of a hub at Fort Worth. As part of this proposal, the *Sunset Limited* was to be rerouted to Dallas, traveling west to El Paso via Abilene and Midland-Odessa. Trains connecting at Fort Worth would be the *Sunset Limited*, the *Crescent Star* from Meridian, MS, the *Texas Eagle*, *Heartland Flyer*, and the proposed service from Shreveport.

As the high-speed rail network develops in Texas, the South Central Corridor, Dallas – Fort Worth Core Express, Dallas - Houston TCR, combined with existing and proposed conventional rail service, the Dallas/Fort Worth Metroplex appears to be a potential hub. Hub cities with convenient connections between multiple routes create a large matrix of city-pairs resulting in substantial ridership potential. It should be noted that stand-alone single corridor only ridership and revenue forecasts generally do not account for the synergy of future rail network additions in their forecasts.

Future Tasks

Planning studies and analysis need to continue to gather further information that would help TxDOT, public officials and citizens to make informed decisions about passenger rail:

- Detailed ridership forecasts that apply travel demand models to clarify the most promising corridors and outline the revenue implications of shorter trip times made possible by higher speed train services, and allow station locations and service frequencies to be determined.
- Engineering studies (including train operation models) and environmental analyses could specify intercity corridors capable of accommodating higher speed train services, both along current freight rail corridors or within separate green field alignments.
- Cost estimates for capital and operating costs of passenger rail alternatives (different technologies and equipment operating at different speeds on specific corridors) could allow comparisons among alternatives.
- Risk analyses could examine passenger rail alternatives and outline risks for project implementation, list escalation factors for cost elements, and test revenue alternatives.

With this information, Texans will be clearly informed about the trade-offs among passenger rail alternatives and make decisions about passenger rail investments. This kind of deliberate study has distinguished states that have received more funding from the FRA for HSIPR projects, and such studies would be required if TxDOT seeks project funding from the federal government for passenger rail improvements.

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