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Introduction
The Metroplex Freight Mobility Study (Study) purpose is to conduct a comprehensive analysis of the freight and passenger rail transportation network in the 16-county Dallas-Fort Worth area to identify mutually beneficial mobility solutions. The outcome of the analysis is a proposed program of projects to address mobility needs in the Metroplex. The work includes two phases:

Phase I: Metroplex Freight and Passenger Rail Integration Study
The objective of Phase I is to confirm infrastructure solutions needed to support expanded passenger service on the existing Trinity Railway Express (TRE) route as well as new passenger service on the Madill Subdivision from Irving to Prosper without negatively affecting freight operations. A Railroad Traffic Control (RTC) model and qualitative data provided by the host railroads confirmed the proposed infrastructure solutions would meet these objectives.

The Phase I study area (Figure 1, bold corridors) is a subset of the territory modeled using RTC and is composed of portions of the BNSF Railway (BNSF) Subdivisions including Fort Worth, Creek, Madill, DFW and trackage rights over Union Pacific Railroad (UP), as well as portions of TRE, Dallas Area Rapid Transit (DART) and the TEXRAIL/Silver Line.

Phase II: Metroplex Freight Mobility Study
The objective of Phase II is to identify mutually beneficial mobility solutions needed to support growth on the freight rail and highway networks. The Grade Crossing Mobility Solutions portion of Phase II includes the analysis, screening, and conceptual engineering and cost estimates for solutions at a select number of highway-railroad grade crossings in the Metroplex. The Rail Network Solutions portion of Phase II includes an expanded RTC model to evaluate proposed solutions for improving multimodal train movement across the region and identify opportunities for public-private partnerships to advance solutions.

The Phase II study area (Figure 2) is the complete railroad network in the Metroplex region. Phase II excludes consideration of potential new passenger rail service on freight rail lines.

Stakeholder Engagement
Throughout Phase I and Phase II, the Study team engaged stakeholders through in-person and virtual stakeholder workshops and individual stakeholder meetings. Engagement with stakeholders from local governments, railroad partners, and other public-entity stakeholders included dialog on data, railroad operations, transit service, mobility solutions, and implementation plans.
Figure 1: Phase I Study Area

Source: TranSystems.
Report Outline

The Metroplex Freight Mobility Study report includes:

- Background: This section summarizes the background and purpose for the Metroplex Freight Mobility Study, along with an overview of the study areas.
- Phase I Summary: This section summarizes the Phase I RTC model confirmation of needed infrastructure solutions.
- Phase II Grade Crossing Mobility Solutions Summary: This section summarizes the grade crossing screening and resulting mobility solutions identified.
- Phase II Rail Network Solutions Summary: This section summarizes the railroad solutions that will accommodate anticipated growth for freight rail movements on the Phase II network.
- Execution Strategy: This section outlines opportunities for collaboration in the implementation process.
Background
The regional railroad network in the Dallas-Fort Worth Metroplex experiences congestion due to volume growth that outpaces the growth in capacity. The regional roadway system has similar congestion problems stemming from growing vehicular and truck volumes. TxDOT, along with various stakeholders, has worked over the last two decades to support mutually beneficial infrastructure solutions for freight and passengers.

In 2010, TxDOT completed the Dallas-Fort Worth Region Freight Study to identify infrastructure solutions in the Dallas and Fort Worth Districts with the potential to improve freight movements, mobility, and safety. The Texas Statewide Analysis Model (SAM), Dallas-Fort Worth Regional Travel Model (DFWRTM), and Rail Traffic Controller (RTC) all showed the highest rail congestion occurs at the Tower 55 interlocking near downtown Fort Worth. The study identified at-grade rail improvements associated with Tower 55, which would generate greater public and private benefits than the cost. The study also suggested re-routing two Amtrak trains from Union Pacific's (UP) Dallas Subdivision over the Trinity Railway Express (TRE), necessitating some relatively low-cost infrastructure improvements to TRE lines. The study identified 44 potential grade separations and 37 potential crossing closures in the Metroplex.

The Texas Freight Mobility Plan (2018) ("Plan") supports the view that the Dallas-Fort Worth Metroplex is a critical node on the railroad network in Texas and provides opportunity for public and private entities to collaborate in development of solutions to enhance freight movement. Specifically, the executive summary notes that the Plan “provides the state with a blueprint for facilitating continued economic growth through a comprehensive, multimodal strategy for addressing freight transportation needs and moving goods efficiently and safely throughout the state.” Within this Plan, the Texas Freight Advisory Committee identified several short-term policy and program actions and projects aimed at accomplishing this goal, including “partner with railroads to develop rail solutions to ease highway traffic congestion.”

The Texas State Rail Plan (2019) includes specific projects proposed to increase rail capacity in Texas and improve existing infrastructure. These projects include Class I rail improvement projects on the BNSF and UP for the Metroplex region. The plan also identified support for continued investment in highway-rail grade crossing elimination projects, grade crossing improvements, and sealed rail corridors to reduce traffic delays, improve roadway safety, and enhance transportation mobility and efficiency. This is directly in line with the solutions examined in Phase II of the Study.

While solutions to improve railroad network mobility in the Metroplex advance, addressing passenger mobility remains an important focus. Regional planning by the North Central Texas Council of Governments (NCTCOG) and transit agencies, such as Dallas Area Rapid Transit
(DART), recognizes the need to move an increasing number of passengers over existing routes and expansion corridors. NCTCOG’s Mobility 2045 and DART’s 2045 Transit System Plan (in progress), illustrate new and expanded service like TexRail, Silver Line, and the future Irving to Prosper service on the Lower Madill subdivision. A timeline for implementation of future passenger service is undefined but it is prudent to continue comprehensive planning to develop infrastructure solutions, identify funding and required stakeholder agreements, and advance environmental clearances.

The unique features of the rail network in the Metroplex, along with the varied priorities of the public and private entities operating on the railroad network, require a high degree of public and private collaboration to enable expansion of both freight and passenger rail capacity. This Metroplex Freight Mobility Study provides the opportunity for a focused review of the rail network to accommodate future demand for both freight and passenger movement with solutions that benefit all stakeholders.
Phase I Summary
In anticipation of future passenger service from Irving to Prosper and deadhead moves from the overnight storage facility to the Silver Line, BNSF built an RTC model to understand future infrastructure constraints along the Madill subdivision. Several model cases with performance metrics, such as Delay Minutes per 100 Train Miles, were analyzed.

A validation process confirmed appropriate model construction with respect to industry acceptable specifications and assumptions. Therefore, the identified infrastructure solutions required to support freight and passenger rail growth without negatively affecting freight operations are valid.

Identification of Rail Solutions
Figure 3 locates the identified infrastructure solutions required to support freight and passenger rail growth without negatively affecting freight operations on a regional map and Table 1 briefly describes the solutions.

Figure 3: Map of Phase I Infrastructure Improvements

Source: TranSystems.
Table 1: Summary of Infrastructure Solutions Required to Expand Passenger Service

<table>
<thead>
<tr>
<th>Infrastructure Solution</th>
<th>2030 Irving to Prosper Passenger Service</th>
<th>2022/2030 Silver Line Deadhead(^1)</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Track, CTC, Crossovers every 5-6 mile from Irving to Prosper</td>
<td>✓</td>
<td></td>
<td>Other solutions may duplicate double track segments</td>
</tr>
<tr>
<td>CTC from Irving to Carrollton, Irving Wye Speed Increase to 30 mph</td>
<td></td>
<td>✓</td>
<td>May require relocation of MOW facility</td>
</tr>
<tr>
<td>Extension of siding near Irving Depot to 10,000 feet</td>
<td>✓</td>
<td>✓</td>
<td>Combined with Irving Wye for $59.1M</td>
</tr>
<tr>
<td>New 10,000-foot siding at New Gribble</td>
<td>✓</td>
<td>✓</td>
<td>Combined with DART’s project at Elm Fork bridge for $72.7M</td>
</tr>
<tr>
<td>CTC on Madill Subdivision between Prosper, TX and Staley, OK</td>
<td>✓</td>
<td></td>
<td>Private Infrastructure not reviewed</td>
</tr>
<tr>
<td>Double Track 1.4 miles from East Mockingbird (MP 639.3) to Medical Center (MP 640.7)</td>
<td></td>
<td>✓</td>
<td>DART estimate at $23.5M</td>
</tr>
<tr>
<td>Double track 0.45 miles from North Junction (MP 643.9) to Union Station (MP 214.2)</td>
<td>✓</td>
<td>✓</td>
<td>Not yet designed, see CP 217 projects</td>
</tr>
<tr>
<td>Speed Increase from 25 mph to 40 mph on DFW Subdivision from MP 769.3 to MP 770.4</td>
<td></td>
<td></td>
<td>Private Infrastructure not reviewed</td>
</tr>
<tr>
<td>New 10,000-foot siding at Sherman</td>
<td>✓</td>
<td></td>
<td>Private Infrastructure not reviewed</td>
</tr>
<tr>
<td>Extension of siding at Hebron to 10,000 feet</td>
<td>✓</td>
<td></td>
<td>Private Infrastructure not reviewed</td>
</tr>
<tr>
<td>New 10,000-foot siding at Clark, OK</td>
<td>✓</td>
<td></td>
<td>Private Infrastructure not reviewed</td>
</tr>
<tr>
<td>New 10,000-foot siding at Madill, OK</td>
<td>✓</td>
<td>✓</td>
<td>Private Infrastructure not reviewed</td>
</tr>
</tbody>
</table>

Source: BNSF RTC Network and TranSystems.

\(^1\) Subsequent operational planning for DART’s Silver Line have located its future Equipment Maintenance Facility at DCTA’s Operation and Maintenance Facility in Lewisville, Texas. Therefore, Phase I project timing will be tied to future passenger service on the Madill Subdivision.
The required infrastructure solutions analysis determined implementation priorities and technical feasibility. During the design review process, several projects changed from the original configuration identified through modeling. These modifications resulted from input from BNSF engineering and operations staff, right-of-way constraints, and topography. The modifications would not likely change model results substantially. Several of the rail improvements identified are on BNSF-owned freight-only subdivisions. The Study team did not review design, technical feasibility, nor cost estimates for projects on the privately owned network.

As an outcome of Phase I, the North Central Texas Council of Governments received a BUILD grant for the NT MOVES (North Texas Multimodal Operations, Velocity, Efficiency and Safety) Program. The grant funds two track infrastructure projects on the TRE and Regional Rail Information System (RRIS) technology to exchange timely information on train movements to improve rail throughput, safety and on-time performance in this congested urban rail corridor. NCTCOG anticipates RRIS technology will reduce delays associated with dispatching handoffs in the region.
Phase II Grade Crossing Mobility Solutions Summary

There are over 2,000 highway-railroad grade crossings in the Metroplex Phase II study area. Around 500 of the crossings are grade separated. In order to develop mobility solutions for the region, the Phase II screening methodology prioritized locations where roadway or railroad mobility challenges currently occur or will likely occur in the future. The screening methodology focused on primary and secondary screening factors using various data and corridor features.

Grade Crossing Screening

TxDOT tracks information at each highway-rail grade crossing in the Texas Railroad Information Management System (TRIMS) database. Data includes average daily traffic, train volumes, train speed, number of tracks, crash history, and other relevant information on each crossing. TxDOT uses this data to calculate a priority index (PI), which prioritizes crossings for improvements on a statewide basis.

The primary screening factors include the PI along with information on previous concepts considered and stakeholder input. Secondary factors include blocked crossing reports, future regional growth areas, and corridors with high potential for train volume growth. The screening process identified and stakeholders confirmed several corridors as important geographies demanding focused attention on mobility solutions, as follows:

- Madill Subdivision (Phase I)
- North Fort Worth Corridor (Alliance and I-35 area)
- South Fort Worth Corridor
- West Fort Worth Corridor (UP Davidson Yard area)
- West Dallas Corridor
- Mesquite Corridor (UP Mesquite Yard area)
- Wylie Corridor (Kansas City Southern (KCS) Wylie Yard area)

At the time data was processed, there were 105 crossings in the study area with a PI value greater than 20. Of those 105 crossings, 35 also have average daily traffic of 10,000 or more vehicles.

Grade Crossing Mobility Concepts

Using the primary and secondary screening factors, the Study team identified crossings for consideration of various mobility solutions, including grade separations, crossing closures, and other modifications to the surrounding transportation network. A separate document for each county in the study area details information on the crossings and solutions identified. Figure 4 maps and Table 2 presents a summary of the crossings selected for development of grade separation concepts, including the economic feasibility of many of the concepts, as determined by benefit-cost analyses (BCA).
**Figure 4: Map of Grade Separation Concept Locations**

Source: TranSystems.
# Table 2: Summary of Information on Grade Separation Concepts ($ in Millions)

<table>
<thead>
<tr>
<th>DOT #</th>
<th>Street</th>
<th>Railroad/Subdivision</th>
<th>2022 Trains/Day</th>
<th>2022 AADT</th>
<th>Cost</th>
<th>BCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>021635L</td>
<td>Coit Road</td>
<td>KCS Alliance</td>
<td>9</td>
<td>45,077</td>
<td>$29.5</td>
<td>◔</td>
</tr>
<tr>
<td>789653H</td>
<td>FM 2514</td>
<td>KCS Greenville</td>
<td>14</td>
<td>12,000</td>
<td>$20.7</td>
<td>-</td>
</tr>
<tr>
<td>414717F</td>
<td>Bus SH 121</td>
<td>DCTA</td>
<td>64</td>
<td>41,000</td>
<td>$29.0</td>
<td>-</td>
</tr>
<tr>
<td>597747C</td>
<td>Nursery Drive</td>
<td>TRE DFW</td>
<td>71</td>
<td>13,612</td>
<td>$19.7</td>
<td>◔</td>
</tr>
<tr>
<td>597759W</td>
<td>Market Center Blvd</td>
<td>TRE DFW</td>
<td>78</td>
<td>15,500</td>
<td>$41.5</td>
<td>-</td>
</tr>
<tr>
<td>672161A</td>
<td>Royal Lane</td>
<td>DART Madill</td>
<td>20</td>
<td>25,016</td>
<td>$23.5</td>
<td>◔</td>
</tr>
<tr>
<td>672171F</td>
<td>Pioneer Drive</td>
<td>DART Madill</td>
<td>8</td>
<td>6,200</td>
<td>$27.3</td>
<td>◔</td>
</tr>
<tr>
<td>794844D</td>
<td>Jim Miller Road</td>
<td>UP Mineola</td>
<td>34</td>
<td>21,000</td>
<td>$49.2</td>
<td>-</td>
</tr>
<tr>
<td>794926K</td>
<td>Westmoreland Rd</td>
<td>UP Dallas</td>
<td>42</td>
<td>30,166</td>
<td>$54.5</td>
<td>◔</td>
</tr>
<tr>
<td>794929F</td>
<td>Chalk Hill</td>
<td>UP Dallas</td>
<td>42</td>
<td>9,987</td>
<td>$22.9</td>
<td>◔</td>
</tr>
<tr>
<td>794971E</td>
<td>Great Southwest Pky</td>
<td>UP Dallas</td>
<td>42</td>
<td>15,133</td>
<td>$33.6</td>
<td>◔</td>
</tr>
<tr>
<td>020486J</td>
<td>Hemphill Street</td>
<td>BNSF Fort Worth</td>
<td>28</td>
<td>12,794</td>
<td>$18.5</td>
<td>◔</td>
</tr>
<tr>
<td>020538Y</td>
<td>McLeroy²</td>
<td>Multiple</td>
<td>60</td>
<td>6,100</td>
<td>$44.1</td>
<td>-</td>
</tr>
<tr>
<td>020634B</td>
<td>Avondale Haslet Rd</td>
<td>BNSF Fort Worth</td>
<td>50</td>
<td>9,100</td>
<td>$27.3</td>
<td>-</td>
</tr>
<tr>
<td>020846E</td>
<td>Seminary Drive</td>
<td>FWWR Dublin</td>
<td>6</td>
<td>7,352</td>
<td>$27.2</td>
<td>◔</td>
</tr>
<tr>
<td>598341W</td>
<td>Beach Street</td>
<td>TRE DFW</td>
<td>78</td>
<td>24,000</td>
<td>$15.9</td>
<td>-</td>
</tr>
<tr>
<td>765265R</td>
<td>Seminary Drive</td>
<td>UP Midlothian</td>
<td>13</td>
<td>10,870</td>
<td>$51.5</td>
<td>◔</td>
</tr>
<tr>
<td>839206W</td>
<td>Winscott Road</td>
<td>UP Baird</td>
<td>21</td>
<td>12,770</td>
<td>$21.1</td>
<td>◔</td>
</tr>
<tr>
<td>NEW</td>
<td>Heritage Trace</td>
<td>Multiple</td>
<td>38</td>
<td>-</td>
<td>$35.3</td>
<td>-</td>
</tr>
<tr>
<td>NEW</td>
<td>McPherson</td>
<td>UP Fort Worth</td>
<td>47</td>
<td>-</td>
<td>$20.1</td>
<td>-</td>
</tr>
</tbody>
</table>

● = very feasible, ◔ = likely feasible, ○ = likely infeasible, ◔ = very infeasible

Source: TranSystems and CDM Smith.

**NOTE:** Economic feasibility evaluation with a benefit-cost ratio was not completed for every concept.

## Grade Separation Economic Feasibility

The benefit-cost analysis (BCA) measures economic feasibility of grade separation concepts by comparing projects’ estimated improvement costs with monetized societal benefits. Costs and benefits are estimated in net-present, real (constant) 2020 dollars.

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² It was not technically feasible to grade separate McLeroy and maintain access.
- Improvement costs include development (planning and engineering (P&E), right-of-way (ROW), construction, and contingencies), and subsequent annual operations and maintenance (O&M) costs.
- Societal benefits include travel efficiencies associated with vehicular hours, including travel time, vehicle operating costs (VOC), and emissions, and accidents avoided with grade-separations and associated closures.

Comparing annual monetized benefits to costs in a BCA framework yields standardized metrics of economic feasibility; the summary focus being on the benefit-cost ratio (BCR).

The study team evaluated economic feasibility of eight grade separation concepts with adjacent closures based on available modeling and assumptions. Vehicular benefits from grade separations/closures, primarily travel time and accident savings, are mostly insufficient to offset improvement costs. Comparatively low traffic-user benefits (versus costs) stem from relatively low vehicular travel delays (estimated for gate-down time, calculated using annual average daily traffic (AADT), train speeds, train length etc.) and infrequent train-vehicle accidents. Generally, too few trains, traveling too quickly, and/or interfacing with relatively low AADT volumes generate insubstantial travel delay and safety benefits to economically justify improvements’ costs.

Figure 5: Societal Benefit and Improvement Cost Types

None of the proposed grade separations analyzed achieved a favorable benefit-cost ratio (i.e., greater than 1.0) using a 7% discount rate, the rate federal grant guidelines suggest. Only Great Southwest Parkway exhibited feasible benefit-cost ratio metrics at an alternative 3% discount rate. Other grade separation/closure projects (Pioneer & Nursery, Royal Lane, and Westmoreland & Chalk Hill) approached breakeven feasibility. The other grade
separation concepts reviewed yielded economically infeasible metrics. Beach Street was not formally analysed but its relatively high train volumes, high ADT and lower cost may indicated it would be economically feasible.

Project feasibility is a function of many quantifiable and qualitative analyses, of which the benefit-cost analysis conducted is a contributing component. Other “feasibility” components include technical, operational, and institutional feasibility. While the BCA does not provide strong economic feasibility metrics for most projects, projects may warrant development for technical, operational, or institutional reasons. The results illustrate how relatively simplified traffic volume assumptions affect economic feasibility, which variables drive benefits and how the various projects compare to one another. Moreover, project feasibility is a function of many quantifiable and qualitative analyses, of which this level economic analysis is a contributing component.

Figure 6: Map of Grade Separation Concept Locations

Source: TranSystems and CDM Smith.
Phase II Rail Network Improvements Summary

The Metroplex Phase II study area is a complex rail network where multiple freight carriers, commuter rail services, and Amtrak operate. It is a network with 14 subdivisions used by BNSF, UP, Fort Worth & Western Railroad (FWWR), Dallas, Garland & Northeastern Railroad (DGNO), TRE, and Denton County Transportation Authority (DCTA). Many of these subdivisions feed traffic between outlying areas into two primary locations in the study area: Tower 55 and CP 217. Tower 55 is where all movement directions cross in Fort Worth (Fort Worth Central Station area) and CP 217 is where all movement directions cross near JFK Junction (Dallas Union Station area).

Train volume growth forecasts reflect an increase of 64% in rail traffic from 2020 to 2045. For the baseline (or existing) infrastructure, modeled delay hours increased by 163% in the analysis period and average train speed decreased from 27.9 mph to 25.8 mph. The forecasted increase in delay and decrease in train speed indicate that the network will experience congestion in the future.

TxDOT and its Metroplex stakeholders supported use of the Phase II Metroplex Rail Traffic Controller (RTC) model to review railroad network performance and identify locations where mutually beneficial infrastructure solutions may support forecasted growth. Initial model observations (documented in a separate technical memorandum) identified several areas where solutions may benefit the public and private transportation networks – points where multiple railroads interact, industry service areas, and yard entry/exit areas. The freight railroads confirmed that capacity constraints in various parts of the network cause them to run fewer trains on desired routes. This feedback and the initial model observations led to a focus on the following network elements:

- Tower 55
- Existing Investments
- Phase I Improvements
- CP 217 Improvements
- Greater Network Investments

Tower 55

A federal discretionary grant, with contributions from the UP, BNSF, North Central Texas Council of Governments, City of Fort Worth, and TxDOT, funded significant improvements to Tower 55 in 2014. The improvements included:

- Constructing a third north-south main line track through Tower 55.
- Building and improving staging tracks near Tower 55 for more efficient train flows.

3 Throughout, the Study identifies the area of focus in central Dallas where all movement directions cross near JFK Junction as “CP 217”, though UP identifies this location as “CP T217.” For consistency between study materials, CP 217 was retained but it is noted that UP uses the label CP T217.
• Enhancing signal arrangement, track alignment, and switches for faster train movements.

Based on the 2045 train volumes projected for the Metroplex Phase II model, about 55% of passenger and freight (non-TRE) trains operating in the study area pass through Tower 55. The high volume of trains traveling through this portion of the study area triggered a sketch level analysis. While the 2014 improvements to Tower 55 included train staging, greater growth in the number of trains held before traversing the diamonds compared to overall train growth indicates growing delay at this location. Train growth through Tower 55 is forecasted to increase by 61% between 2020 and 2045 but the amount of delay due to train holds is expected to increase by 330%.

Previous studies included potential grade separations of the primary north-south and east-west mainlines to address the growing delay; however, implementation remains challenging with adjacent highway interchange ramps and other infrastructure in close proximity. This study did not repeat efforts associated with evaluating these improvements but Tower 55 remains a top priority for the freight railroads. The delay at Tower 55 should be monitored and a more detailed analysis be conducted as train growth is realized.

Existing Investments
The railroad stakeholders reported capital investments are underway for improved operations on their networks in the Metroplex. These projects are representative of on-going investment in corridors with growing freight and passenger volumes and are shown on Figure 7 and include the following:

• BNSF Fort Worth Subdivision Saginaw Area Improvements
• TRE Double Track BUILD Grant Projects
• Trinity Lakes Station Relocation
• BNSF Fort Worth Subdivision Double Track

Phase I Improvements
Phase I identified additional improvements to the DART and BNSF Madill Subdivision. While the improvements were broken into various segments, when combined the proposed projects would essentially create a double track from the Irving Wye to Prosper. Additionally, plans to double track portions of the TRE corridor in Dallas County were included and now funded through a BUILD grant. These improvements are outlined in more detail earlier in this document and shown conceptually on Figure 8.

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4 The RTC model analysis does not incorporate the TRE projects as part of the baseline network. However, grant funding was announced for these projects mid-way through analysis and they will be built in the short-term and will be part of the existing network in the short term.
Figure 7: Map of Existing Investments in the Metroplex

FUNDDED IMPROVEMENTS

1. BNSF Fort Worth Subdivision Saginaw Area Improvements
2. TRE Double Track BUILD Grant Projects
3. Trinity Lakes Station Relocation
4. BNSF Fort Worth Subdivision Double Track

Source: TranSystems.
CP 217 Improvements
Capacity constraints at CP 217 result from commuter train schedules, multiple railroad interactions, and limited track capacity. Constraints to the infrastructure in this area include nearby highway corridors, historic districts and resources, right-of-way district coordination, and nearby projects, including Texas Central High Speed Rail and the I-30 expansion.

The CP 217 Improvements at Wye solution proposes additional tracks near the JFK Junction wye to allow freight trains to advance through the corridor with less interaction with the passenger trains. An initial, phased investment of $47M at the Wye will result in an average savings of 1.3 minutes of delay per train trip.

As the CP 217 Improvements at Wye solution was reviewed with stakeholders, it was determined that it alone would not provide a comprehensive solution and additional consideration for track capacity should be made to Forest Avenue where the BNSF DFW Subdivision turns south. The I-30 expansion that TxDOT is designing also spurred
consideration of an ultimate track configuration. It is important to stakeholders that the highway infrastructure not limit future track needs.

As the concept was further developed, stakeholders and model results pointed to additional capacity needs. Modeling results showed that a track extension from Trinity Junction to the east to complete the double track on the UP Mineola Subdivision as it enters Dallas should be considered. There is a potential need for three tracks in this area as it is a key juncture between multiple subdivisions. Modeling results showed that the UP Dallas Subdivision would benefit from a third main track from Fort Worth to Dallas. Model results pointed to capacity needs on the BNSF DFW Subdivision related to movements through CP 217. Figure 9 shows the improvement locations noted.

The $140M investment for the CP 217 Improvements to Forest Avenue and UP Mineola Extension (two main tracks) solution provides benefits of reducing delay by 7.5 minutes per train. The benefits of investment at CP 217 incrementally improves as solutions are implemented across the study area network.

The benefits of the CP 217 improvements for this analysis do not include the effects of coordination delays between the three dispatching systems in this area. As the region implements the grant-funded Regional Rail Information System technology, monitoring of the modeled area to measure delay reductions resulting from the technology can better optimize any network solutions needed for future capacity demands.

Numerous adjacent projects are under consideration near CP 217. Stakeholder coordination in relation to these projects may help to reduce future project costs and identify more benefits that can aid feasibility. Nearby projects include, but are not limited to:

- TxDOT I-30 Reconstruction
- TxDOT I-35 Reconstruction
- DART Light-Rail Transit (LRT) Second Track in West End Junction
- Potential Amtrak Station Relocation
- Texas Central High Speed Rail Station
- Dallas Convention Center Master Plan
- Future High Speed Rail or other modal connections to Fort Worth via the TRE or other identified corridors

Again, stakeholders indicated that the highway infrastructure should not limit future track needs. It should also be noted that combined design approaches may provide creative solutions that benefit the overall transportation network. For instance, building permanent bridges in lieu of shoofly configurations may provide continuous railroad operation and limit highway construction costs, as sites and conditions allow.
Greater Network Investments

Capacity constraints on other subdivisions used to travel into and out of the study area impact the full benefits of reduced delay at CP 217, and to some extent any future solution to Tower 55. A focus review of subdivisions with high train volumes identified a set of additional solutions to consider which would further improve overall performance in the study area. A collective analysis of these solutions, in conjunction with the CP 217 improvements, suggested average train speeds in the network would increase 2.2 mph and train delays drop by 28 percent.

The improvements show on Figure 10 focus on siding improvements (new and extensions) and capacity improvements including double track and universal crossovers.
Figure 10: Map of Future Improvements in the Metroplex

Source: TranSystems.

**Rail Network Economic Feasibility**

A BCA measures economic feasibility of improvement concepts by comparing projects’ estimated improvement costs with monetized societal benefits. For the rail network improvements in Phase II only a limited BCA was performed using:

- Improvement costs – include development (P&E, ROW, construction, and contingencies), and subsequent annual O&M costs.
- Societal benefits – benefits reflect reduced train delay.

Using limited benefits, the projects at CP 217 did not meet economic feasibility thresholds. As late-developing projects, the base-case and build BCA scenarios were not fully developed, nor was sufficient data available to quantify the broad range of potential benefits that might arise. Discussions suggest that failure to implement solutions will constrain future rail service, resulting in freight diversion to truck. Since the per ton truck-transport is significantly more expensive than rail, the potential benefits of avoiding the truck diversion...
costs would notably affect BCA metrics. Furthermore, the extra roadway wear and tear from
the additional trucks on roadway condition may yield additional benefits of note.

Traffic volumes (rail vs. truck) under the base and build alternatives warrants additional
study to better understand project economic feasibility and facilitate comparison with other
public-sector rail improvement projects.
**Execution Strategy**

Throughout the Metroplex Freight Mobility Study the various stakeholders have taken active roles in working toward mutually beneficial solutions to address anticipated freight train growth and planned passenger rail service. A coordinated approach and continued partnerships will aid implementation especially when seeking possible federal, state, local, or private funding,

TxDOT completed the Metroplex Freight Mobility Study with NCTCOG to provide support to stakeholders in this rapidly growing region. TxDOT and NCTCOG routinely provide coordination support across jurisdictions and with multiple railroad stakeholders. While most of the concepts are not under TxDOT's jurisdiction, this plan lays the groundwork for communities or railroad stakeholders who wish to advance mutually beneficial solutions.

This study provides an early identification of investment needs at CP 217 and continued support of solutions at Tower 55, among other important grade separations and rail investments. The Phase II model analysis shows that continued investment in the Metroplex railroad network is needed to minimize deterioration of rail network fluidity and to reduce train delays as the anticipated growth in train volumes to 2045 materializes.

TxDOT's planned highway investments adjacent to these project nodes and other identified locations could easily conflict with future needs for the rail network. Accordingly, both TxDOT and the stakeholder railroads should conduct early and continued coordination to find mutual benefit while planning and advancing projects.

While the findings of the Metroplex Freight Mobility Study Phase I and Phase II provide insight into mobility solutions for the Metroplex, a more refined level of detail is needed to carry projects to implementation. Future phases of study will help to refine concepts and develop benefits needed for project feasibility. Potential projects for Phase III or future study include:

- Madill Subdivision Capacity Improvements at Gribble and Irving Wye in conjunction with future passenger service
- CP 217 Improvements to Forest Avenue and UP Mineola Extension (two main tracks)
- Tower 55
- Advancing design at priority grade separations

Future phases could include preliminary engineering and environmental reviews. Advancing work on these projects may refine costs and help to secure funding for implementation. Any of these projects may become part of the NT MOVES program as partners coordinate efforts toward implementation.