

## VIII. CORRIDOR DESCRIPTION AND EVALUATION

### **CORRIDOR DESCRIPTIONS**

At the Regional Rail Corridor Study got underway, ten designated corridor segments were identified for detailed study. The map in Exhibit VIII-1 shows the location of these segments. This chapter presents a summary description of each of the corridors and an overview of the process by which they were evaluated for feasibility.

As mentioned in previous chapters, Corridors E-1 and W-3 shown in the following map, represent the Trinity Railway Express. Based on initial discussions of the project team, the Trinity Railway Express was removed from further analysis as part of the RRCS work. TRE operates daily service between Dallas and Fort Worth and has a Capital Improvement Plan already in place. In addition, funds for double tracking portions of the right-of-way and adding other improvements are anticipated to be addressed in the Regional Transportation Council's Partnership Program #2. TRE development and operating costs were used as a real-world, in-region experience to develop the unit costs used for estimating the other corridors, where appropriate. Additional discussion of the Trinity Railway Express is included in Chapter VI – Issue Identification.




More detailed information on each of these corridors is presented in an accompanying document, Regional Rail Corridors Study – Corridors Report.

**EXHIBIT VIII-1**

**CORRIDOR LOCATION MAP**

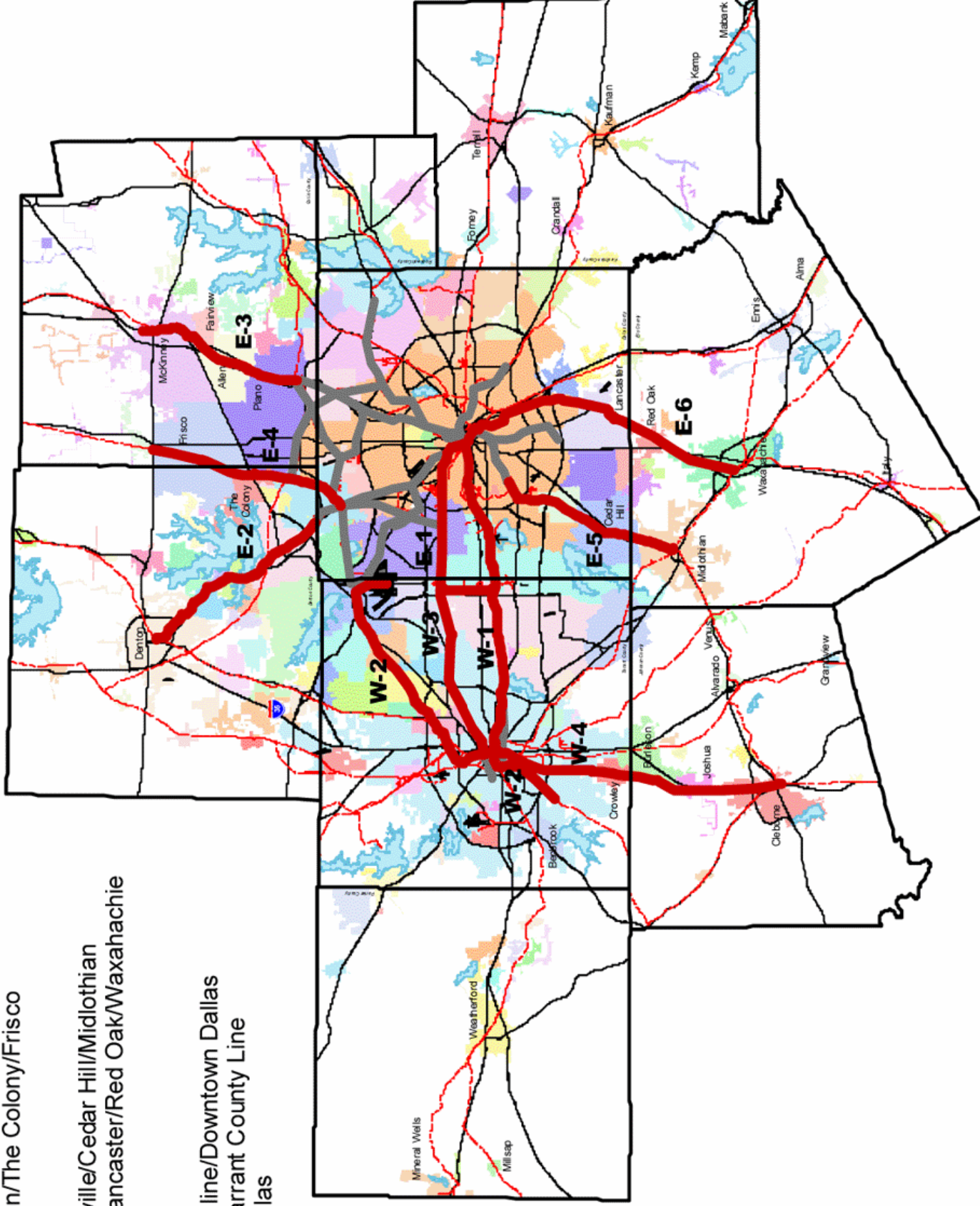
- Northeast:**  
 E-3: Dallas Area Rapid Transit: Plano/Allen/Fairview/McKinney  
 E-4: Burlington Northern Santa Fe: Carrollton/The Colony/Frisco
- Southeast:**  
 E-5: Burlington Northern Santa Fe: Duncanville/Cedar Hill/Midlothian  
 E-6: Burlington Northern Santa Fe: Dallas/Lancaster/Red Oak/Waxahachie
- Central:**  
 E-1: Trinity Railway Express: Dallas County line/Downtown Dallas  
 W-3: Trinity Railway Express: Fort Worth/Tarrant County Line  
 W-1: Union Pacific Mainline: Fort Worth/Dallas  
 (includes Dorothy Spur)
- W-4: Burlington Northern Santa Fe:**  
 Fort Worth/Burleson/Joshua/Cleburne
- W-2: Fort Worth & Western/Cotton Belt:**  
 Southwest Fort Worth/Tarrant  
 County Line
- E-2: Union Pacific: Carrollton/Denton**

**Legend**

-  Rail Corridors Under Study
-  Existing Rail Corridors
-  Roadway
- E = East/URS Corporation
- W = West/Carter-Burgess, Inc.



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## E-2 – Denton Line Corridor Description

Corridor E-2 is a former Missouri Kansas Texas (MKT) railroad, then owned briefly by the Union Pacific Railroad before being bought by DART. It extends between Carrollton and Denton, a distance of 22.9 route miles. The milepost (MP) designations covered during the hi-rail inspection trip of May 19, 2003 were MP 730.9 at Lake Dallas at Swisher Road and MP 744.6 at the Carrollton Depot. Of the 22.9 miles, 13.7 miles between Carrollton and Lake Dallas are in operation and 9.2 miles between Lake Dallas and Denton has had the track removed and has been converted to the Denton Branch Rail Trail. The trail portion of the line was inspected on July 9, 2003 between MP 721.7 in Denton and MP 730.9 in Lake Dallas.

The City of Denton owns the trail right-of-way between Denton and Lake Dallas and DART owns the rights to replace the track and operate rail service. The right-of-way is consistently 100 feet or less in width. DART owns the right-of-way between Lake Dallas and Carrollton. The right-of-way is also consistently 100 feet or less in width. There are also several large billboards within the right-of-way along portions of the line between Lake Dallas and Carrollton.

A shortline railroad, the Dallas Garland & Northeastern Railroad (DGNO), operates one round trip local train per day, Monday through Friday, between Carrollton and Lake Dallas. The current maximum operating speed limit is 10 mph due to track conditions. The line is not signaled and is operated as “Other than Main Track” (OMT). A fact sheet summarizing the existing conditions and issues for the E-2 corridor is shown in Exhibit VIII-2.

## EXHIBIT VIII-2

### E-2 CORRIDOR FACT SHEET

Owner(s) of the Line	DART (for the existing rail section)
Operator(s) of the Line	DGNO
Trackage Rights	DGNO (between Carrollton and Lake Dallas, 13.7 miles)
Length of the Corridor	22.9 Miles (9.2 miles is Denton Branch Rail Trail)
Average Trains per Weekday	2 local switching trains
Track Summary	<ul style="list-style-type: none"><li>▪ Single main track</li><li>▪ 10 mph maximum speed</li><li>▪ No passing sidings and no railroad signaling</li></ul>
Railroad Crossings	<ul style="list-style-type: none"><li>▪ Thirty-eight (38) at-grade highway/railroad crossings</li><li>▪ Three (3) grade-separated highway/railroad crossings</li><li>▪ Two (2) at-grade railroad/railroad crossings</li></ul>
Jurisdictions	<ul style="list-style-type: none"><li>▪ Denton, Corinth, Lake Dallas, Hickory Creek, Lewisville, and Carrollton</li></ul>
Industrial Sidings	<ul style="list-style-type: none"><li>▪ 10 total</li></ul>
Corridor Issues	<ul style="list-style-type: none"><li>▪ All new track for entire corridor</li><li>▪ Replace bridges on Trail portion between Denton and Lake Dallas.</li><li>▪ Additional study needed to determine actual condition of Lake Lewisville and Trinity River bridges.</li><li>▪ Need to add CTC signal system.</li></ul>

Detailed information for the E-2 Corridor may be found in the accompanying document, Regional Rail Corridor Study – Corridors Report.

### E-3 – McKinney Line Corridor Description

Corridor E-3 is a former Union Pacific Railroad line that extends between Plano and McKinney, a distance of approximately 16.3 route miles. The milepost (MP) designations covered during the inspection trip of July 9, 2003 were MP 282.1 at the former St. Louis Southwestern Railroad (SSW or Cotton Belt) track in Plano and MP 298.4 at McIntyre/ Collin County Road 274 in McKinney.

DART owns the entire right-of-way. The right-of-way is consistently 100 feet in width north of Plano. Through Plano, the right-of-way is 40 feet to 60 feet in width. The Dallas Garland & Northeastern (DGNO) has trackage rights between Stacy Road (FM2786) and Sherman. The segment of track between the former SSW line in Plano and Stacy Road, a distance of approximately 8.4 miles, has not been in operation for 5 or 6 years. A fact sheet summarizing the existing conditions and issues for the E-3 corridor is shown in Exhibit VIII-3.

**EXHIBIT VIII-3**

**E-3 CORRIDOR FACT SHEET**

Owner(s) of the Line	DART
Operator(s) of the Line	DART/DGNO
Trackage Rights	None
Length of the Corridor	16.3 Miles
Average Trains per Weekday	2 local switching
Track Summary	<ul style="list-style-type: none"> <li>▪ Single track with 1 siding in McKinney. No railroad signaling. Operated as yard limits with maximum speed of 10 mph. No service between Plano and approximately MP 290.5 (about 8 miles).</li> </ul>
Railroad Crossings	<ul style="list-style-type: none"> <li>▪ Twenty-eight (28) at-grade highway/railroad crossings</li> <li>▪ Four (4) grade-separated highway/railroad crossings</li> <li>▪ One (1) at-grade railroad/railroad crossings</li> </ul>
Jurisdictions	<ul style="list-style-type: none"> <li>▪ Plano, Allen, Fairview, and McKinney</li> </ul>
Industrial Sidings	<ul style="list-style-type: none"> <li>▪ Four</li> </ul>
Corridor Issues	<ul style="list-style-type: none"> <li>▪ All new track and rehabilitation of all bridges</li> <li>▪ Issue of ending commuter rail service at DART station at Parker Road or connecting to SSW (UP) track.</li> <li>▪ Need to add CTC signal system.</li> </ul>

Detailed information for the E-3 Corridor may be found in the accompanying document on corridors.

## E-4 – Frisco Line Corridor Description

Corridor E-4 is a Burlington Northern and Santa Fe Railway (BNSF) line that extends between Carrollton and Frisco, a distance of approximately 19.5 route miles. The milepost (MP) designations covered during the hi-rail inspection trip of July 8, 2003 were MP 700.5 in Carrollton and MP 681.03 in Frisco. The hi-rail inspection trip was ended some 3.8 miles south of U.S. Highway 380 at MP 684.8 because of train traffic on the line north of Frisco.

The BNSF owns all of the right-of-way along the E-4 Corridor. The right-of-way is consistently 100 feet in width with some locations being as much as 300 feet in width. A fact sheet summarizing the existing conditions and issues for the E-4 corridor is shown in Exhibit VIII-4.

### **EXHIBIT VIII-4**

#### **E-4 CORRIDOR FACT SHEET**

Owner(s) of the Line	BNSF
Operator(s) of the Line	BNSF
Trackage Rights	None
Length of the Corridor	19.5 Miles
Average Trains per Weekday	12 to 14 (approximately half are rock trains)
Track Summary	<ul style="list-style-type: none"><li>▪ Single track with 1 siding at Hebron.</li><li>▪ No railroad signaling.</li><li>▪ Maximum speed is 48 mph.</li></ul>
Railroad Crossings	<ul style="list-style-type: none"><li>▪ Twenty-six (26) at-grade highway/railroad crossings</li><li>▪ Six (6) grade-separated highway/railroad crossings</li><li>▪ Two (2) at-grade railroad/railroad crossings and one (1) over-crossing.</li></ul>
Jurisdictions	<ul style="list-style-type: none"><li>▪ Carrollton, through The Colony, ends in Frisco</li></ul>
Industrial Sidings	<ul style="list-style-type: none"><li>▪ Six</li></ul>
Corridor Issues	<ul style="list-style-type: none"><li>▪ High value homes along tracks in Frisco.</li><li>▪ Need to add CTC signal System.</li></ul>

Detailed information for the E-4 Corridor may be found in the document on corridors.

### E-5 – Midlothian Line Corridor Description

Corridor E-5 is a Burlington Northern and Santa Fe Railway (BNSF) line that extends between Midlothian and the DART light rail station at Westmoreland Road in Dallas, a distance of approximately 18.8 route miles. The milepost (MP) designations covered during the hi-rail inspection trip of July 8, 2003 were MP 26.9 in Midlothian and MP 45.7 at the DART Westmoreland Station.

BNSF owns all of the right-of-way along the E-5 Corridor. DART has LRT operating rights between the Westmoreland Station and Duncanville. The right-of-way is typically 100 feet in width. A fact sheet summarizing the existing conditions and issues for the E-5 corridor is shown in Exhibit VIII-5.

## EXHIBIT VIII-5

### E-5 CORRIDOR FACT SHEET

Owner(s) of the Line	BNSF
Operator(s) of the Line	BNSF
Trackage Rights	DART has LRT rights between DART Westmoreland Station and Duncanville.
Length of the Corridor	18.8 Miles
Average Trains per Weekday	4 local
Track Summary	<ul style="list-style-type: none"><li>▪ Single track without passing sidings (except at industries).</li><li>▪ No railroad signaling.</li><li>▪ Maximum speed is 20 mph.</li></ul>
Railroad Crossings	<ul style="list-style-type: none"><li>▪ Twenty-five (25) at-grade highway/railroad crossings.</li><li>▪ Eight (8) grade-separated highway/railroad crossings.</li><li>▪ One (1) at-grade railroad/railroad crossing.</li></ul>
Jurisdictions	<ul style="list-style-type: none"><li>▪ Midlothian, through Cedar Hill, Duncanville, ends in Dallas.</li></ul>
Industrial Sidings	<ul style="list-style-type: none"><li>▪ Sixteen including auto facility, coal-fired power plant, cement plant near Midlothian, and Cedar Hill Industrial Park.</li></ul>
Corridor Issues	<ul style="list-style-type: none"><li>▪ Track to be upgraded for higher speeds.</li><li>▪ Need to add CTC signal system.</li><li>▪ Communities along the line appear to be sparsely populated.</li></ul>

Detailed information for the E-5 Corridor may be found in the accompanying report.

### E-6 – Waxahachie Line Corridor Description

Corridor E-6 is a Burlington Northern and Santa Fe Railway (BNSF) line that extends between Dallas and Waxahachie, a distance of approximately 30.7 route miles. The milepost (MP) designations covered during the hi-rail inspection trip of July 8, 2003 were between MP 768.4 at Forest Avenue in Dallas and MP 796.7 in Waxahachie.

BNSF owns all of the right-of-way along the E-6 Corridor except for the 2.4 miles between Dallas Union Station and Forest Avenue. Between Union Station and Forest

Avenue, the UP owns and dispatches the track. Union Pacific also has trackage rights to serve local industries. The right-of-way is typically 100 feet in width. A fact sheet summarizing the existing conditions and issues for the E-6 corridor is shown in Exhibit VIII-6.

**EXHIBIT VIII-6**

**E-6 CORRIDOR FACT SHEET**

Owner(s) of the Line	BNSF
Operator(s) of the Line	BNSF
Trackage Rights	UP
Length of the Corridor	30.7 Miles
Average Trains per Weekday	6
Track Summary	<ul style="list-style-type: none"> <li>▪ Single track with passing sidings at Lancaster, Sterret, and Armaglass.</li> <li>▪ Automatic Block Signal (ABS) system with maximum freight speed of 40 mph and passenger speed of 60 mph.</li> </ul>
Railroad Crossings	<ul style="list-style-type: none"> <li>▪ Thirty-nine (39) at-grade highway/railroad crossings.</li> <li>▪ Ten (10) grade-separated highway/railroad crossings.</li> <li>▪ Two (2) at-grade railroad/railroad crossings.</li> </ul>
Jurisdictions	<ul style="list-style-type: none"> <li>▪ Waxahachie, through Red Oak, Lancaster, ends in Dallas.</li> </ul>
Industrial Sidings	<ul style="list-style-type: none"> <li>▪ 24 with several at Sargent, Sterret, Service, and Armaglass.</li> </ul>
Corridor Issues	<ul style="list-style-type: none"> <li>▪ Communities along the line appear to be sparsely populated.</li> <li>▪ BNSF/UP at-grade railroad crossing at Forest Avenue is a bottleneck for commuter rail operations.</li> <li>▪ BNSF/UP at-grade railroad crossing near Grand Avenue is a bottleneck for commuter rail operations.</li> </ul>

Detailed information for the E-6 Corridor may be found in the accompanying document.

**W-1 – Union Pacific Mainline Corridor Description**

Corridor W-1 is a Union Pacific rail line that extends 37 miles from the T&P Terminal in downtown Fort Worth to Union Station in downtown Dallas. The Union Pacific Mainline between downtown Fort Worth and downtown Dallas is a Class I rail line that carries a

high volume of freight rail traffic, currently carrying approximately 30 trains per day. The Union Pacific Railroad owns all of the right-of-way along the W-1 corridor. The railroad right-of-way is typically 100 feet in width. The Burlington Northern Santa Fe has trackage rights for shared use of the mainline under agreement with the Union Pacific Railroad. The mainline is double tracked throughout the entire corridor, with Centralized Train Control (CTC) signaling and maximum operating speed of 60 mph. A fact sheet summarizing the existing conditions and issues for the W-1 corridor is shown in Exhibit VIII-7.

**EXHIBIT VIII-7**

**W-1 CORRIDOR FACT SHEET**

Owner(s) of the Line	Union Pacific Railroad
Operator(s) of the Line	Union Pacific Railroad
Trackage Rights	BNSF
Length of the Corridor	37 Miles
Average Trains per Weekday	30
Track Summary	<ul style="list-style-type: none"> <li>▪ Double tracks with Centralized Traffic Control Signaling</li> <li>▪ Maximum operating speed is 60 mph.</li> <li>▪ Garrett Yard (auto facility) is located near Hwy. 360 in Arlington.</li> <li>▪ Centennial Yard is located in Fort Worth.</li> </ul>
Railroad Crossings	<ul style="list-style-type: none"> <li>▪ Thirty-five (35) at-grade highway/railroad crossings.</li> <li>▪ Twenty-eight (28) grade-separated highway/railroad crossings.</li> </ul>
Jurisdictions	<ul style="list-style-type: none"> <li>▪ Cities of Dallas, Grand Prairie, Arlington, and Fort Worth.</li> <li>▪ Dallas and Tarrant Counties.</li> </ul>
Industrial Sidings	<ul style="list-style-type: none"> <li>▪ Pioneer Paper; Pioneer South Central Inc.; General Motors; Great Industrial Southwest District.</li> </ul>
Corridor Issues	<ul style="list-style-type: none"> <li>▪ High volume freight traffic.</li> <li>▪ Tower 55 congestion.</li> <li>▪ Planned new intermodal terminal location to be determined.</li> <li>▪ Capacity of Dallas Union Station and Fort Worth T&amp;P Station limited by existing rail activity.</li> </ul>

Detailed information for the W-1 Corridor may be found in the separate corridors document.

## W-2 – Hulen/DFWIA Line Corridor Description

Corridor W-2 consists of approximately 26 miles of the Cotton Belt Line from Dallas-Fort Worth Airport (MP 610.0) to Fort Worth (MP 632.0) and approximately 6 miles of the Southwest Extension from downtown Fort Worth to Hulen Street.

An inspection of the Cotton Belt from SH 121 to Fort Worth was performed on August 26, 2003 and an inspection of the Southwest Extension was performed on September 18, 2003. The Cotton Belt track was also inspected by riding the Tarantula Excursion Train on August 30, 2003, from the Tarantula Train Depot in Grapevine to the Fort Worth Stockyards.

DART owns the Cotton Belt from DFW Airport to Tower 60 in Fort Worth. DART leases the track to the Fort Worth and Western Railroad and the City of Grapevine has trackage rights for the Tarantula excursion train operating on the track between Grapevine Station and the Fort Worth Stockyards. The maximum operating speed over the Cotton Belt is 25 mph and the train traffic is controlled by track warrants. A fact sheet summarizing the existing conditions and issues for the W-2 corridor is shown in Exhibit VIII-8.

## EXHIBIT VIII-8

### W-2 CORRIDOR FACT SHEET

Owner(s) of the Line	DART
Operator(s) of the Line	Fort Worth & Western Railroad
Trackage Rights	Fort Worth & Western Railroad
Length of the Corridor	32 Miles including Fort Worth Southwest Extension.
Average Trains per Weekday	2 passenger trains daily; freight trains average 3 per week.
Track Summary	<ul style="list-style-type: none"><li>▪ Single Track; Speed varies between 10 mph and 25 mph.</li><li>▪ Train traffic control by track warrant.</li><li>▪ Hodge Yard is located in Fort Worth.</li><li>▪ Grapevine Station is located in Grapevine on Main Street.</li></ul>
Railroad Crossings	<ul style="list-style-type: none"><li>▪ Thirty-six (36) at-grade highway/railroad crossings.</li><li>▪ Eight (8) grade-separated highway/railroad crossings.</li></ul>
Jurisdictions	<ul style="list-style-type: none"><li>▪ Cities of Grapevine, Colleyville, Hurst, North Richland Hills, and Fort Worth.</li><li>▪ Tarrant County.</li></ul>
Industrial Sidings	<ul style="list-style-type: none"><li>▪ Grapevine, Hodge, Fort Worth.</li></ul>
Corridor Issues	<ul style="list-style-type: none"><li>▪ UPRR Crossing Diamond located at MP 627.72; UPRR is upgrading the existing DART track from MP 627.73 to MP 630.60 (Deen Road). This is a joint effort between UPRR and BNSF for directional running with northbound trains on UP and southbound trains on BNSF.</li><li>▪ Existing timber trestle bridges are in need of repair/replacement.</li><li>▪ Capacity of Fort Worth T&amp;P Station limited by existing rail activity.</li><li>▪ Existing track in poor condition.</li><li>▪ Southwest extension should extend to Hulen Street in Fort Worth.</li></ul>

Detailed information for the W-2 Corridor may be found in the accompanying report.

#### W-4 – Cleburne Line Corridor Description

Corridor W-4 is a 29-mile corridor extending from the Intermodal Transportation Center and T&P Terminal in downtown Fort Worth south, paralleling the Burlington Northern Santa Fe (BNSF) mainline to the communities of Crowley, Burleson, Joshua, and Cleburne. The corridor also parallels the highway alignments of IH-35, SH 174, and the planned Southwest Parkway. The W-4 corridor extends from the T&P Terminal in

downtown Fort Worth south to the communities of Crowley, Burleson, Joshua, and Cleburne.

The BNSF owns the railroad right-of-way from MP 344.86 to MP 319 and beyond. The Union Pacific owns the right-of-way from MP 344.38 to MP 344.86 and the BNSF has trackage rights to also operate over this section. A fact sheet summarizing the existing conditions and issues for the W-4 corridor is shown in Exhibit VIII-9.

**EXHIBIT VIII-9**

**W-4 CORRIDOR FACT SHEET**

Owner(s) of the Line	Burlington Northern Santa Fe
Operator(s) of the Line	Burlington Northern Santa Fe
Trackage Rights	BNSF operates over UPRR MP 344.38 to MP 344.86
Length of the Corridor	29 Miles
Average Trains per Weekday	Approximately 27 freight trains.
Track Summary	<ul style="list-style-type: none"> <li>▪ Single track with passing tracks at Cleburne, Joshua, Crowley, Burleson, and Fort Worth.</li> <li>▪ Maximum operating speed is 79 mph.</li> <li>▪ BNSF has yards at Cleburne and Fort Worth.</li> <li>▪ Track is controlled by Centralized Traffic Control signaling.</li> </ul>
Railroad Crossings	<ul style="list-style-type: none"> <li>▪ Thirty-one (31) at-grade highway/railroad crossings.</li> <li>▪ Twelve (12) grade-separated highway/railroad crossings.</li> </ul>
Jurisdictions	<ul style="list-style-type: none"> <li>▪ Cities of Cleburne, Joshua, Crowley, Burleson, and Fort Worth.</li> <li>▪ Tarrant and Johnson Counties.</li> </ul>
Industrial Sidings	<ul style="list-style-type: none"> <li>▪ Johns Manville Products; Rubbermaid.</li> </ul>
Corridor Issues	<ul style="list-style-type: none"> <li>▪ Hampton Road Overpass was under construction at approximate MP 332.0.</li> <li>▪ Sycamore Strip Airport is located at approximate MP 336.0.</li> <li>▪ BNSF Main Line from Temple to Fort Worth.</li> <li>▪ Carries a high volume of freight traffic.</li> </ul>

Detailed information for the W-4 Corridor may be found in the accompanying report on corridors.

## EVALUATION OF ALTERNATIVES

Each alternative considered was evaluated with a set of performance indicators. The corridors were scored based upon a five-point system, with five indicating a “good” score and one indicating a “poor” score. The individual criteria scores were then added to reflect a total score for each alternative, including a performance benchmark representing the overall cost effectiveness of each option. Although the benchmark is not identical to that currently in use by the Federal Transit Administration in the official New Starts Alternatives Analysis process to evaluate cost effective transit investments, it is similar enough in nature to allow reasonable conclusions to be drawn.

The list of performance indicators follows:

1. *Performance Benchmark* – Reflects the relative benefit per rider by calculating the annualized cost per annual rider. Represents a balance of capital cost and the use of the system. The RRCS Performance Benchmark is a measure used to normalize the evaluation of each of the corridors with various lengths, costs, and ridership. This benchmark is a “cost effectiveness” measure using the annualized capital cost, annualized operating cost, and annualized ridership producing a resulting calculation of annual cost per rider. It is similar to the original Federal Transit Administration’s cost effectiveness index. The one now being used by FTA adds in the additional considerations for travel time savings and user benefits.
2. *Total Daily Ridership Forecast* – The average number of riders using the system on a daily basis. Reflects the usefulness and attractiveness of the system.
3. *One-Way Trip Time* – The total time, in minutes, that a train or bus takes to travel from the terminal station at one end of a route to the terminal station at the other end

of the route. The faster the one-way trip time, the more riders the system is likely to attract.

4. *Estimated Capital Cost* – The estimated capital cost to construct the system. Systems with lower capital cost are preferred over those with higher capital cost.
5. *Estimated Annual O&M Cost* – The estimated cost to operate and maintain the system on an annual basis. Systems with lower O&M cost are preferred over those with higher O&M cost.
6. *Local Authority and Funding* – The existence of a local transportation authority and the availability of funding reflect local support and are required for the system to be constructed and operated in a more timely manner than if an authority and funding were not in place.
7. *Community Acceptance* – Reflects the degree to which the local communities accept or reject the proposed corridor improvements and transit system. Solid support for a particular system is desirable.
8. *Ease of Implementation* – The degree of ease of difficulty that might be expected to construct and implement a proposed system. A system that is easy to implement because right-of-way acquisition, environmental issues, station site locations, and other major elements of a transit system are easily accommodated or are known are more likely to be completed on schedule and within budget.
9. *Connectivity with Existing and Planned Transit Operations* – The compatibility of the proposed transit system with any existing or planned transit service. Technology that is compatible with connecting transit services may preclude the need for riders to transfer between modes rather than to remain on the same train or bus to, or near, their destination. The ability to interline service is more convenient for riders and allows faster trip times, which could attract more riders to the service.

10. *Compatibility with Freight Railroad Operations* – The ability to operate the proposed service and technology with freight railroad operations. If track is jointly used in railroad right-of-way, the transit service must use FRA compatible equipment. If the equipment is not “compatible” the transit operation must use new, separate tracks. Transit operations that are compatible with freight railroad operations may be able to share railroad trackage and facilities, which may result in savings in both capital and operating cost as well as the implementation schedule for the proposed system.
11. *Serves Area of Unmet Mobility Need* – The ability of the proposed transit system to potentially serve unmet mobility needs, especially with respect to roadway capacity. The severity of the current and projected deficiency in roadway capacity determines whether the proposed transit service will have any noticeable impact upon roadway congestion. Because most roadways already have moderate to severe deficiencies in capacity, the implementation of transit service may not appear to have any effect upon roadway congestion. If new traffic lanes are constructed, they are immediately filled with cars due to the unmet roadway capacity need. The implementation of transit service will result in the removal of some of the traffic, which will allow some of the unmet need to be filled. The more ridership the transit system attracts from roadways, the more the unmet need for capacity can be alleviated.
12. *Impact Upon Adjacent Highways and Air Quality* – The potential impact of a proposed transit service on adjacent highways express as an equivalent number of traffic lanes in each direction. The impact upon air quality is assumed to be proportional to the number of equivalent traffic lanes. The higher the number of equivalent traffic lanes, the greater the benefit the transit system will have on highway congestion and construction and air quality.

13. *Transit Oriented Development Potential* – The ability of the proposed transit service to attract growth and development along the system, especially at station locations. Usually, systems with higher ridership attract growth and development at a faster pace than do systems with low ridership.

## **DEVELOPMENT OF RIDERSHIP FORECASTS**

Performance Benchmark 2, Total Projected Daily Ridership, is a critical performance criterion when evaluating the viability of different scenarios. Average weekday ridership is often generated by a set of mathematical models that use, as input, the digitally coded transportation system as well as the study area's land use and demographics scenario, and generate projected average weekday riders for each line in the transit network. A series of statistical and behavioral relationships constitute the body of these simulation models.

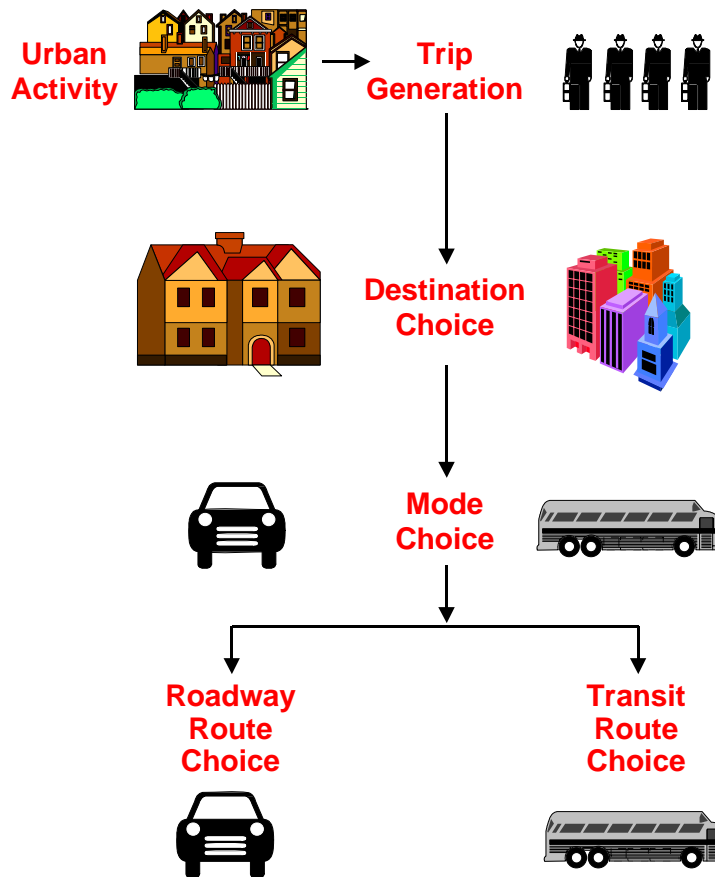
The state of the practice of travel demand modeling breaks up the process into four sequential steps intended to simulate the decision-making behavior of a given traveler and is composed of the following four steps:

1. *Trip Generation*- the process of estimating the number of trips produced by and attracted to each zone.
2. *Destination Choice*- the process of linking trip productions and attractions across the region.
3. *Mode Choice*- the process of estimating the number of person trips using a particular mode of travel between zones.

4. *Trip Assignment (Roadway and Transit Route Choice)* – the process of loading auto and transit trips onto the roadway and transit networks in the region.

Exhibit VIII-10 illustrates the order and flow of this process.

**EXHIBIT VIII-10**  
**FOUR STEP TRAVEL DEMAND FORECASTING PROCESS**



Source: NCTCOG

Model development and calibration typically follows this sequential process with each of the four steps iteratively adjusted until the highway, or transit, assignment yields results that closely replicate observed values. When the calibrated travel model steps have

been defined for an observed base year, then future year travel demand can be projected for a given planning horizon year. The Dallas-Fort Worth Regional Travel Model (DFWRTM) was used to estimate year 2030 average weekday riders for each corridor alternative. The DFWRTM is the regionally approved travel-forecasting model used for all corridor planning analysis in the Dallas-Fort Worth area. The 2030 demographic scenario used in this analysis was adopted as the official set of population and employment forecasts for the region. Each RRCS corridor was evaluated under 2030 conditions, with varying station locations, interlining assumptions, and modal (regional rail, light rail, and bus rapid transit) assumptions.

In order to streamline the development of travel forecasts for the study, the various feasible modal alternatives for each corridor were combined into a series of system alternatives for forecasting. Several of the corridors also serve travel markets that interact or compete with each other, so it was important to design the system forecasts to minimize this interrelationship as much as possible. Travel demand forecasts for four Rail System Alternatives were developed initially. Exhibit VIII-11, Exhibit VIII-12, Exhibit VIII-13, and Exhibit VIII-14 show the combinations of regional and light rail in the RRCS corridors. In addition, a Bus Rapid Transit System Alternative was developed and forecasts prepared. The BRT System Alternative is shown in Exhibit VIII-15. Ridership summaries for these alternatives are included later in this chapter.

In addition to the assumptions pertaining to different technologies and operating characteristics (station locations, headways, operating speeds, and supply of feeder buses at stations), each system alternative had a different configuration of transit options in other planning corridors.

### Rail System Modeling Alternative 1

Rail System Alternative 1, shown in Exhibit VIII-11, included regional rail in the W-2 FW&W/Cotton Belt, W-3 Trinity Railway Express and W-4 BNSF Fort Worth to Cleburne corridors in the west and in E-1 Trinity Railway Express, E-4 BNSF Carrollton to Frisco and E-6 BNSF Dallas to Waxahachie corridors in the east. The W-2 and W-4 corridors and the W-3 and E-1 Trinity Railway Express Corridors and the Dorothy Spur were interlined. All were evaluated with 20-minute peak and 60-minute off-peak headways.

### Rail System Modeling Alternative 2

Rail System Alternative 2, shown in Exhibit VIII-12, included regional rail in the W-1 UP Fort Worth – Dallas, W-4 BNSF Fort Worth to Cleburne corridors in the west and the E-2 DART/MKT Carrollton to Denton, E-3 DART Plano to McKinney and the E-5 BNSF Duncanville to Midlothian corridors in the east. None of these corridors were interlined and the W-4 Corridor was different from Alternative 1 with a routing change near the Fort Worth Central Business District to include a stop at the T&P Building. All were evaluated with 20-minute peak and 60-minute off-peak headways.

### Rail System Modeling Alternative 3

Rail System Alternative 3, shown in Exhibit VIII-13, included regional rail in the W-2 FW&W Cotton Belt through to southwest Fort Worth and light rail in the W-1 UP Fort Worth – Dallas, E-2 DART/MKT Carrollton to Denton, E-3 DART Plano to McKinney and the E-6 BNSF Dallas to Waxahachie corridor. The W-1 UP Fort Worth - Dallas corridor and the E-6 BNSF Dallas to Waxahachie corridor were not interlined, but the E-2 DART/MKT Carrollton to Denton Corridor was evaluated as an extension of the DART NW/SE LRT line and the E-3 DART Plano to McKinney was evaluated as an extension

of the DART North Central LRT line. The regional rail headways were as in the previous alternatives, 20-minute peak and 60-minute off-peak. The light rail service was evaluated at 10-minute peak and 20-minute off-peak headways, as is currently operated in the DART LRT system.

#### Rail System Modeling Alternative 4

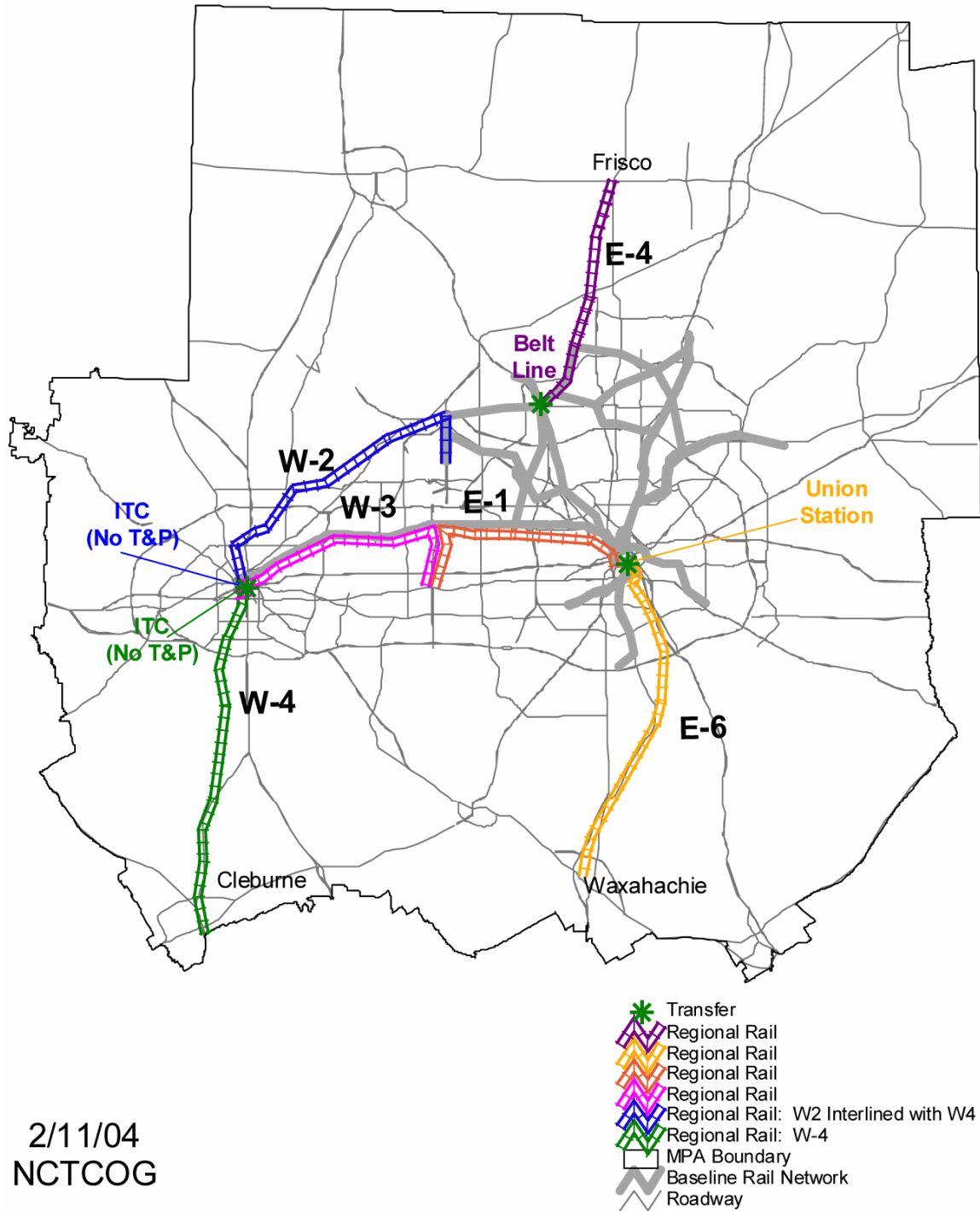
Rail System Alternative 4, shown in Exhibit VIII-14, included both regional rail and light rail options. The W-3/E-1 Trinity Railway Express corridor was interlined with the Fort Worth Southwest extension of the W-2 corridor service as regional rail. The E-5 BNSF Duncanville to Midlothian corridor service was evaluated as an extension of the DART West Oak Cliff light rail and the E-4 BNSF Carrollton to Frisco line as an extension of the DART NW/SE LRT line. As before, the regional rail was tested at 20-minute peak and 60-minute off-peak headways, and the light rail at 10-minute peak and 20-minute off-peak headways.

#### Bus Rapid Transit System Modeling Alternative

A fifth alternative was also developed to evaluate Bus Rapid Transit system alternatives throughout the RRCS corridors. This option used roadway, rail bed, and portions of the High Occupancy Vehicle system already contained in the 2004 update to Mobility 2025, used as the background for the forecasts. The BRT service was evaluated in exclusive right-of-way as no other vehicles would be allowed on the running ways. The BRT System Alternative is shown in Exhibit VIII-15.

**EXHIBIT VIII-11**

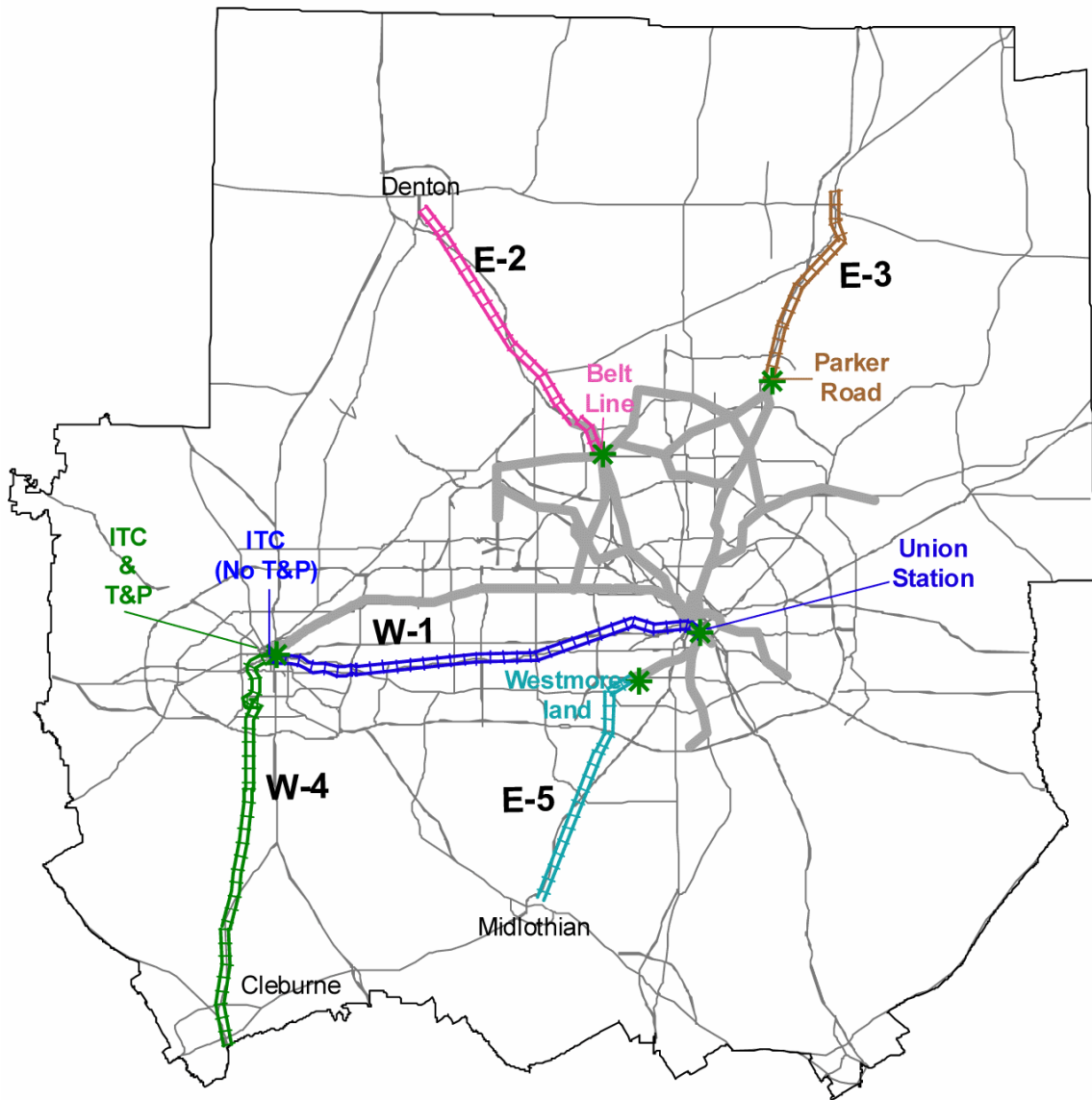
**REGIONAL RAIL CORRIDOR STUDY – RAIL SYSTEM MODEL ALTERNATIVE 1**












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**EXHIBIT VIII-12**

**REGIONAL RAIL CORRIDOR STUDY – RAIL SYSTEM MODEL ALTERNATIVE 2**

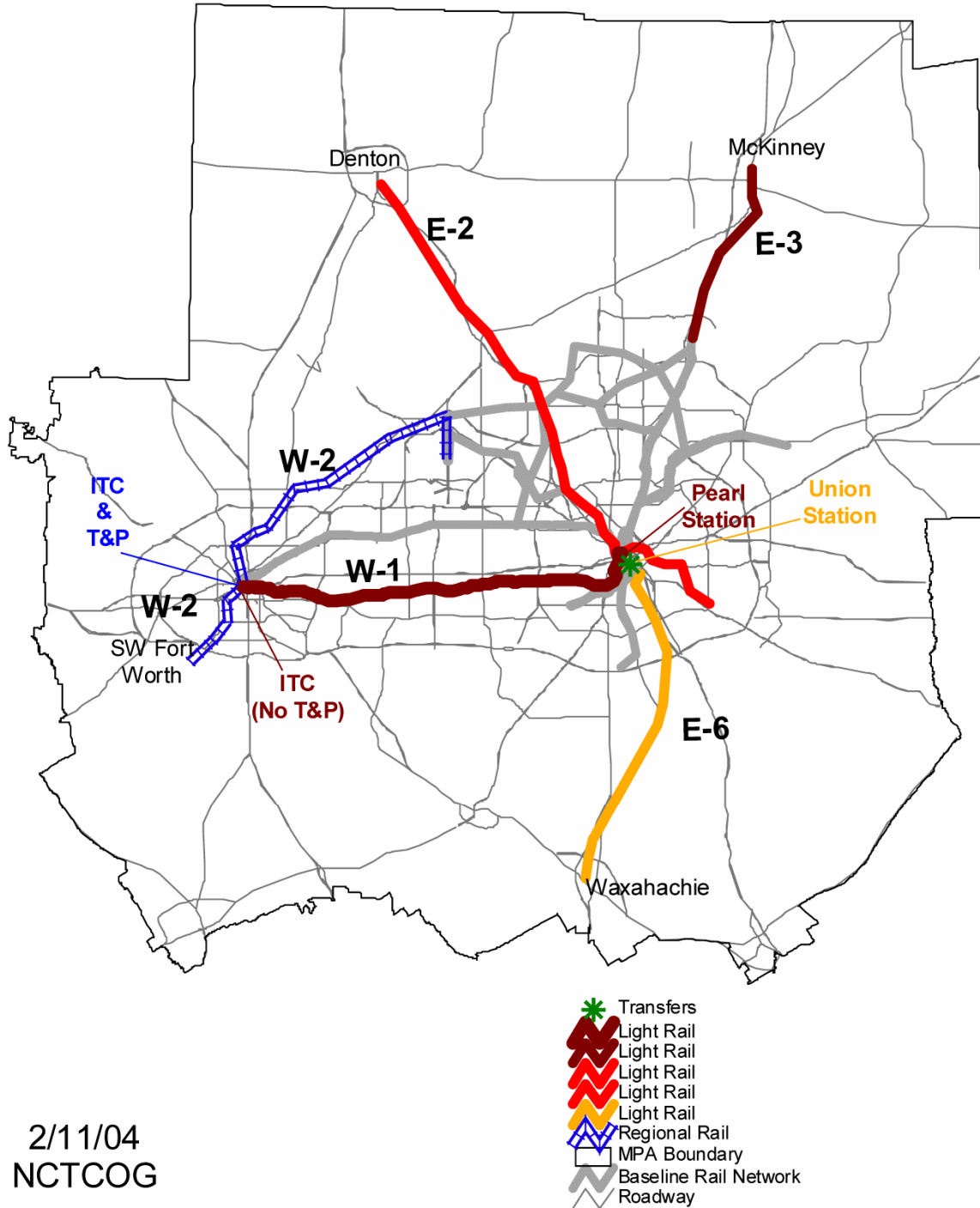


-  Transfer
-  Regional Rail
-  Regional Rail
-  Regional Rail
-  Regional Rail
-  Regional Rail
-  MPA Boundary
-  Baseline Rail Network
-  Roadway

2/11/04  
NCTCOG

**EXHIBIT VIII-13**

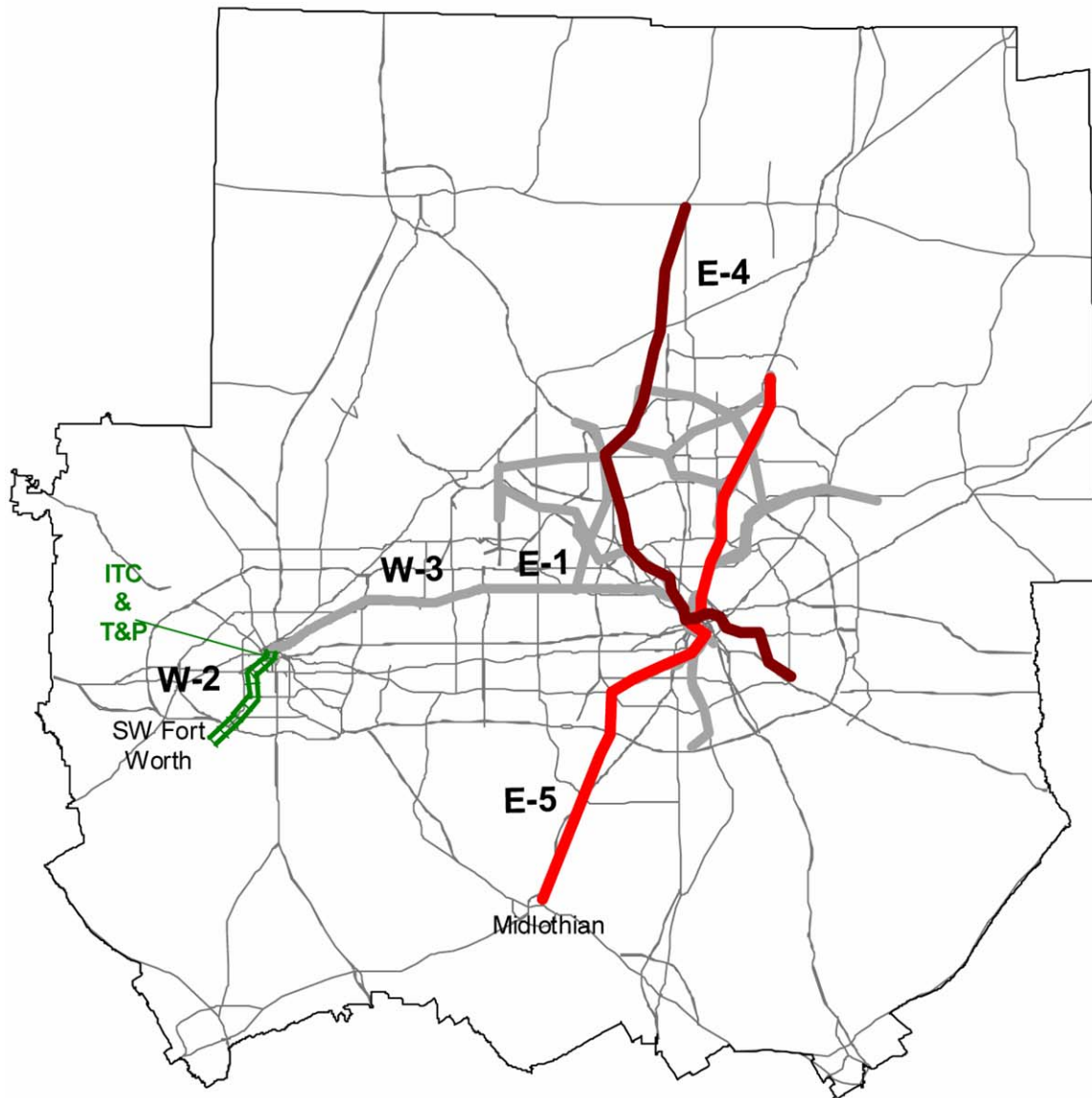
**REGIONAL RAIL CORRIDOR STUDY – RAIL SYSTEM MODEL ALTERNATIVE 3**









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NCTCOG

**EXHIBIT VIII-14**

**REGIONAL RAIL CORRIDOR STUDY – RAIL SYSTEM MODEL ALTERNATIVE 4**

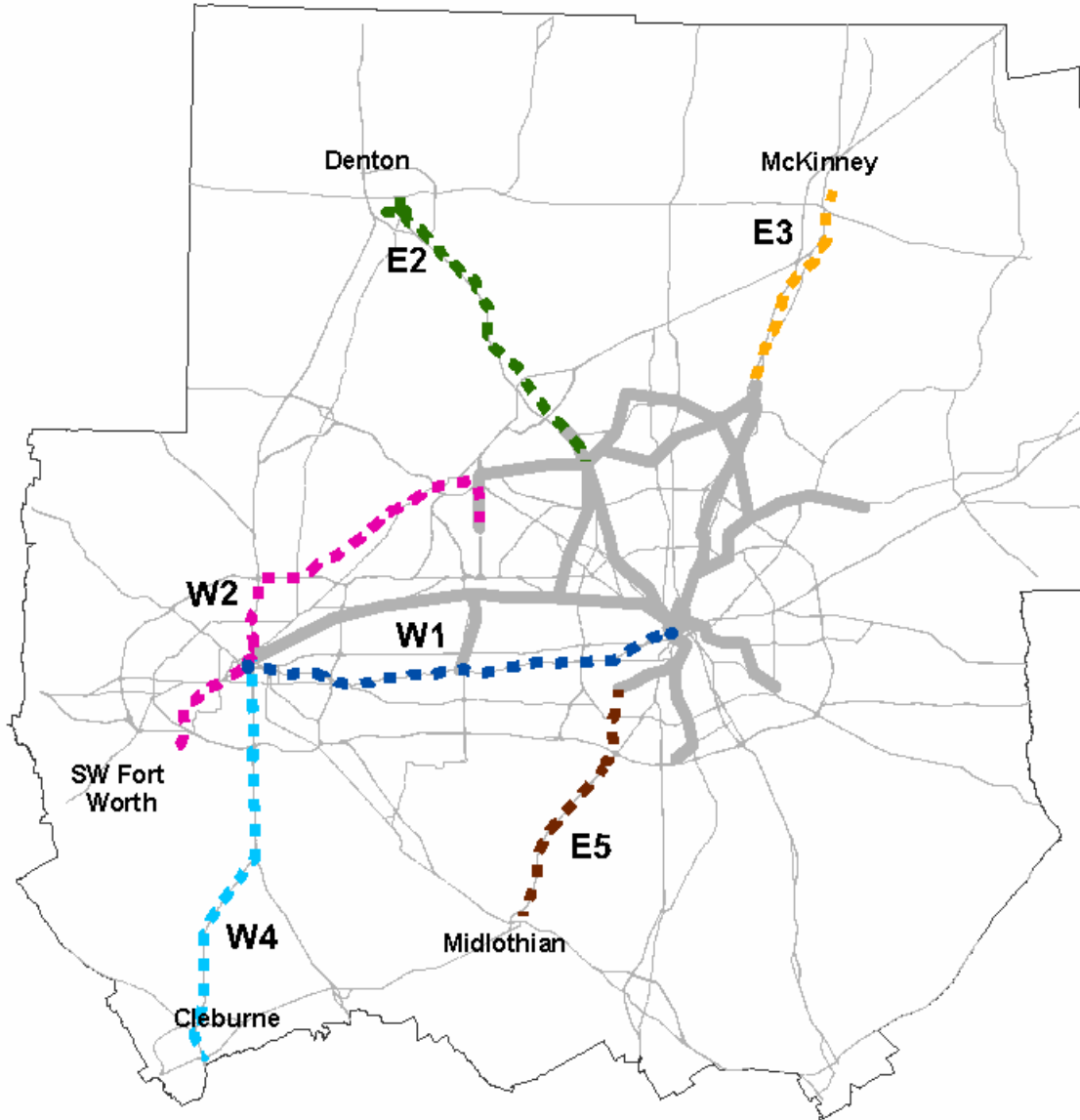


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-  Light Rail (Frisco/NW/SE)
-  Regional Rail: W2 Interlined with W3/E1
-  Light Rail (Parker Road/NCentral/Midlothian)
-  MPA Boundary
-  Baseline Rail Network
-  Roadway

**EXHIBIT VIII-15**

**REGIONAL RAIL CORRIDOR STUDY – BRT SYSTEM MODEL ALTERNATIVE**



- ◆◆ E2 Bus Rapid Transit
- ◆◆ E3 Bus Rapid Transit
- ◆◆ E5 Bus Rapid Transit
- ◆◆ W1 Bus Rapid Transit
- ◆◆ W2 Bus Rapid Transit
- ◆◆ W4 Bus Rapid Transit
- Baseline Rail Network
- Roadway
- MP A Boundary

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NCTCOG

### Final Recommended Model Alternative

The four rail system modeling alternatives and the BRT system modeling alternative system alternatives and the BRT system alternative were reviewed in order to identify the best option for each RRCS Corridor. The corridor specific ridership for each model alternative (regional rail, light rail, and bus rapid transit) was taken from the rail system or BRT system alternative with the highest average weekday corridor riders. The ridership was then used in the evaluation of each corridor/modal alternative using the performance indicators discussed earlier this chapter.

The resulting “score” from the performance indicators for each corridor and modal option was compared, and the best performer selected. For example, regional rail, light rail, and bus rapid transit were all evaluated for the E-2 Corridor. Regional rail was part of the Rail System Modeling Alternative 2 travel forecast, E-2 light rail was part of the Rail System Modeling Alternative 3 forecast and E-2 BRT was part of the BRT System Modeling Alternative forecast.

The set of indicator values for each option in each corridor can be found in the various presentations developed throughout the stages of the project, contained in the CD-ROM accompanying this document. Based on this evaluation, a final set of recommendations was developed, identifying one technology and operating scenario for each corridor. These were combined into a final complete regional rail system (no BRT options were recommended), the Final Run Recommended Modeling Alternative shown in

Exhibit VIII-16.

Unlike the Rail System Modeling Alternatives for this effort, the Final Run Recommended Alternative included interlining of some of the RRCS Corridors with others in the background rail system of the Mobility 2025 – 2004 Update. Interlining occurs when a rail corridor connects with another in a manner that could allow for no-transfer/one seat service throughout both corridors. For example, Corridor E-2 was interlined along the BNSF Corridor and the TRE Corridor to allow one seat service from Denton to the Dallas CBD and vice versa (shown in light orange on the following map). In addition, E-2 was interlined with the eastern portion of the Cotton Belt Corridor to allow one seat service from Denton to Dallas/Fort Worth International Airport (shown in solid red on the following map). This interlining or one seat service is shown in Exhibit VIII-15 with separately colored lines along the corridors. Corridor E-3 was interlined from McKinney through downtown Dallas to the end of the West Oak Cliff line in southwest Dallas. Corridor E-4 was interlined along the BNSF and the TRE, providing one seat service from Frisco to the Dallas CBD.

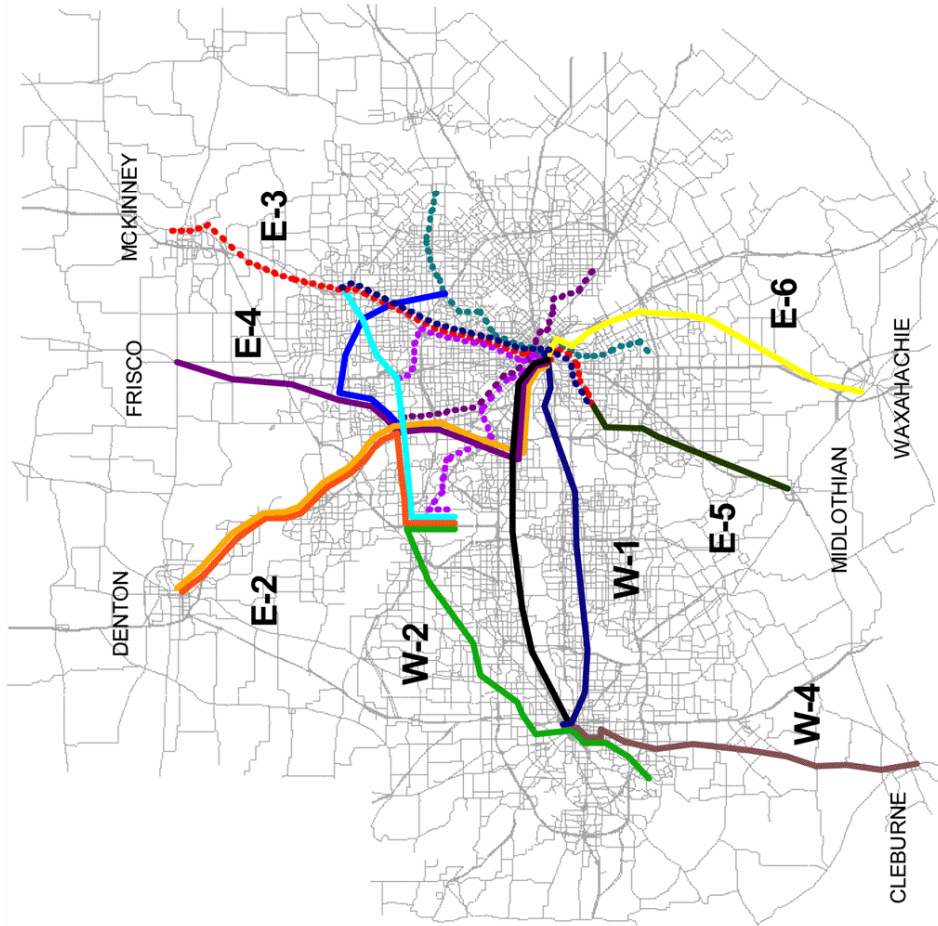
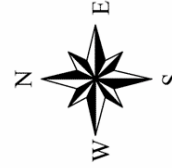
**EXHIBIT VIII-16**

**REGIONAL RAIL CORRIDOR STUDY – FINAL RUN RECOMMENDED ALTERNATIVE**

**Final System Run**  
Interlining Assumptions

**Legend**

- Route System Selection Sets
- LRT (Addison-LBJ-T14-DFW) 10/20
  - E-3 LRT/RR (McKinney-Westmoreland-Midlothian) 20/40
  - E-3 LRT (Parker Rd - Westmoreland) 20/40
  - LRT (Rowlett - South Oak Cliff) 10/20
  - LRT (Northwest - Southeast) 10/20
  - E-2 RR (Denton - Dallas) 40/120
  - E-2 RR (Denton - DFWIA) 40/120
  - E-4 RR (Frisco - South Irving - Dallas) 20/60
  - E-5 RR (Westmoreland - Midlothian) 20/60
  - E-6 RR (Union - Waxahachie) 20/60
  - W-1 RR (ITC - Union) 20/60
  - W-2 RR (Hulen - DFWIA) 20/60
  - W-3 RR (TRE) 20/60
  - W-4 RR (Alt 2; ITC - Cleburne) 20/60
  - RR (North Crosstown) 20/60
  - RR (North Crosstown) 20/60
  - Roadways



## Ridership Results

Exhibit VIII-17 presents average weekday ridership for each of the modal alternatives in the study. This information resulted from Rail System Alternatives 1 through 4 and the BRT System Alternative and was used to help identify the most reasonable options for each corridor for inclusion in the Final Run Recommended Alternative.

### **EXHIBIT VIII-17**

#### **AVERAGE 2030 WEEKDAY RIDERSHIP: MODEL ALTERNATIVES 1-4 AND BRT**

<b>Corridor</b>	<b>Regional Rail</b>	<b>Bus Rapid Transit</b>	<b>Light Rail</b>
W-1	15,000	22,400	32,800
W-2	11,700	9,800	-
W-3	8,300	-	-
W-4	5,900	7,600	-
E-1	9,800	-	-
E-2	4,100	6,800	8,800
E-3	6,600	8,600	10,300
E-4	7,500	-	8,400
E-5	4,200	5,300	8,000
E-6	6,100	-	10,500

Source: NCTCOG-DFWRTM

Note: Ridership in this table comes from the travel forecasts for the Rail System Alternatives 1 through 4 and the BRT System Alternative under which the technology or mode performed the best, not from the Final Run Recommended Alternative.

Regional rail ridership values are included in this table for the TRE Corridor (E-1 and W-3) for comparison purposes only. As noted previously in this report, the TRE Corridor was not part of the detailed corridor evaluation. It is also important to note that the ridership included under the various technologies for each corridor comes from the Alternative under which that corridor performed the best from a ridership perspective (see Exhibit VIII-18). In some cases the Exhibit VIII-17 data is higher than the final ridership data because the combination of corridors included in each Rail System Alternative (Alternatives 1 through 4) attempted to isolate corridors from those nearby that could potentially compete for riders.

The Final Run Recommended Modeling Alternative ridership is shown in Exhibit VIII-18. The year 2007 and 2030 ridership is included, along with adjusted ridership. The year 2007 forecast was prepared to assist in recommendations for near- or long-term implementation needs (see Exhibit II-3 in Chapter II). This particular demographics scenario was partly chosen due to the availability of socio-economics and land use datasets and coded background networks. Analysis of demand and the respective costs under the staging horizon years helps to determine the impact of demographics growth on each of the alternatives. Consequently, it can lead to the identification of corridors that exhibit the highest potential for priority implementation. The results of the staging analysis are shown in Chapter II of this report, Exhibit II-3.

As mentioned previously, the Final Run Recommended Alternative included interlining of some of the RRCS Corridors with others in the background Mobility 2025 – 2004 Update rail network. In order to reflect the benefits this interlining provides, ridership in the interlined corridors (E-2, E-3, E-4) was reported differently.

It is assumed that interlining benefits are not reflected in station ridership data along a given corridor, the sum of which constitutes total corridor ridership. These adjustments were based on rail link gateway volumes at the terminus of each of these corridors. The rail link volumes for the Final Run Recommended Alternative for 2007 and 2030 are shown in Exhibit VIII-19 and Exhibit VIII-20. For example then, Exhibit VIII-20 shows 9,570 daily riders in the E-3 Corridor on the link just north of the DART system connections. This was rounded to 9,600 daily riders for use in the final performance

indicator summary for the RRCS effort and is reported as the E-3 Corridor ridership in Exhibit VIII-18.

**EXHIBIT VIII-18**

**AVERAGE 2007 AND 2030 DAILY REGIONAL RAIL RIDERSHIP  
IN THE FINAL RUN RECOMMENDED MODELING ALTERNATIVE**

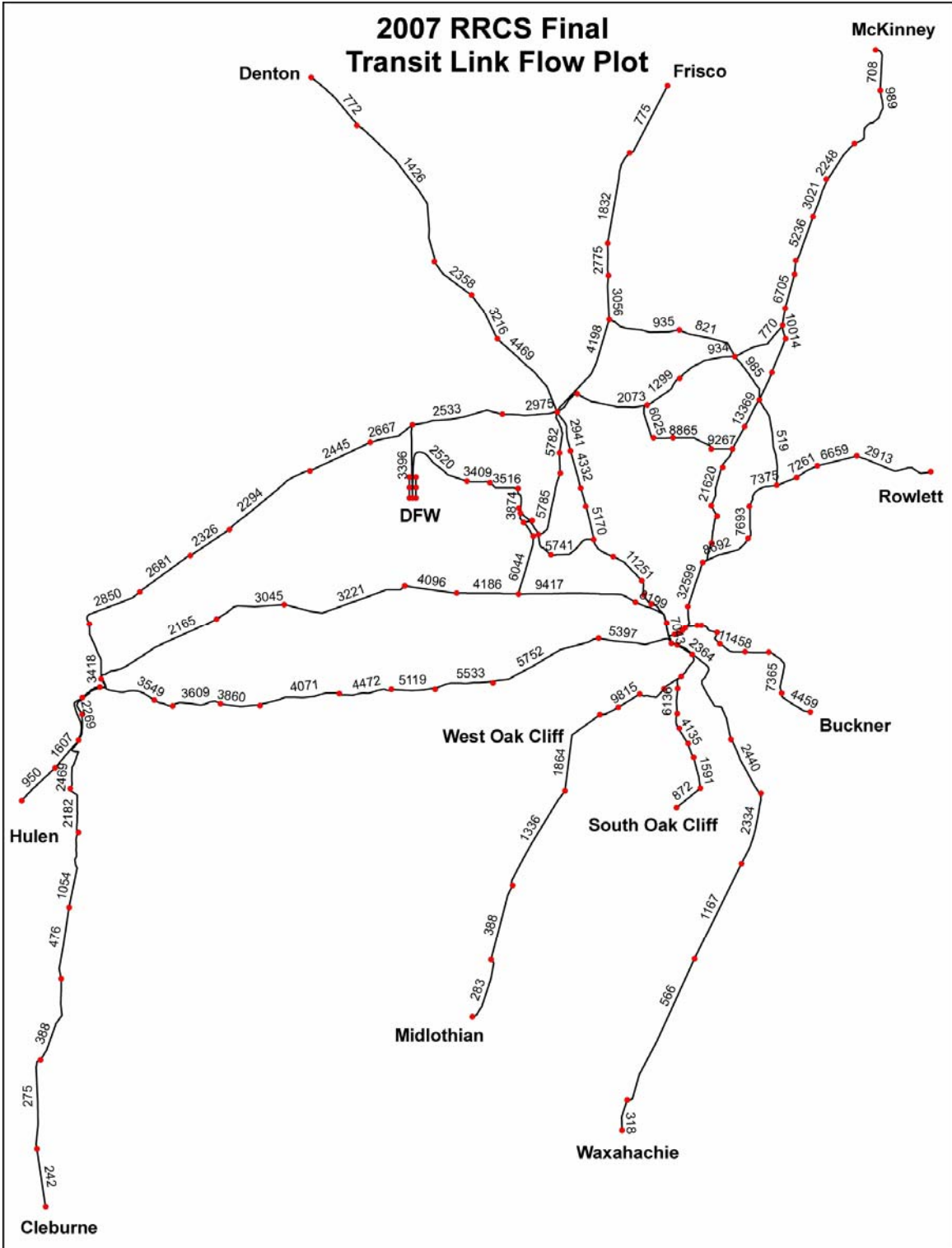
<b>Corridor</b>	<b>2007 Ridership</b>	<b>2030 Ridership</b>	<b>2030 Ridership Adjusted</b>
W-1	9,900	11,600	11,600
W-2	7,900	9,400	9,400
W-3	7,400	8,300	8,300
W-4	3,300	5,000	5,000
E-2	4,300	5,700	6,200*
E-3	5,000	7,100	9,600*
E-4	3,000	5,500	6,500*
E-5	2,100	3,200	3,200
E-6	2,700	4,000	4,000

\* - Adjusted Ridership

Source: NCTCOG-DFWRTM

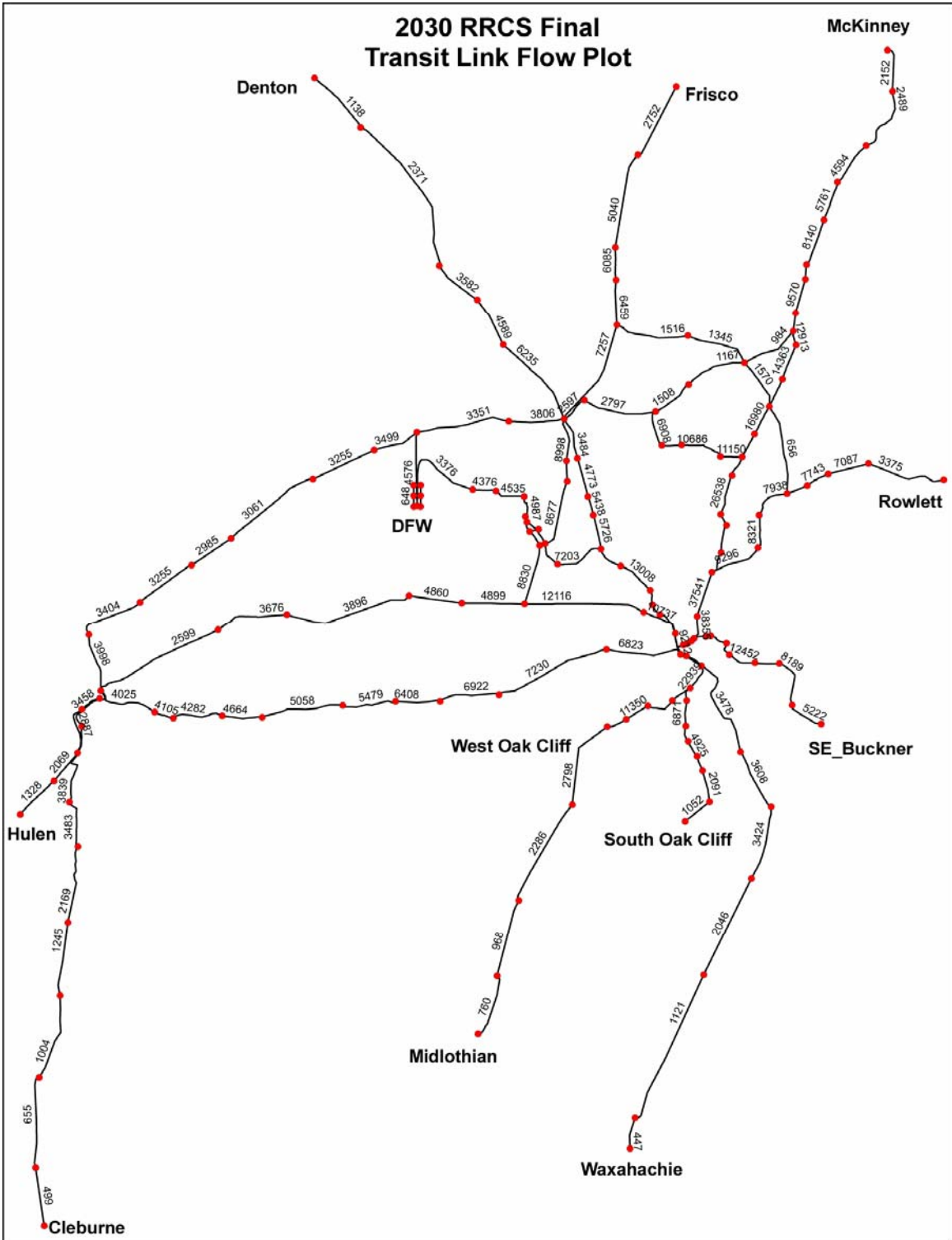
**EXHIBIT VIII-19**

**YEAR 2007 LINK VOLUME MAP**



**EXHIBIT VIII-20**

**YEAR 2030 LINK VOLUME MAP**



Analysis of patronage forecasts also entailed detailed reviews of projected passenger boardings and alightings at each station. Station access forecasts by walk, auto, and feeder bus were checked for accuracy and reasonableness. Such detailed scrutiny of data ensures the identification of potential coding errors and helps with the equilibration of feeder bus supply at each station. Corridor line ridership is the sum of demand at stations along a given line. Exhibit VIII-21 and Exhibit VIII-22 present ridership by station for eastern and western corridors, respectively.

It is important to note; however, when referring to the station activity in the previous exhibits that the final line ridership for Corridors E-2, E-3 and E-4 does not match that shown in Exhibit VIII-20 as the adjustment for interlining benefits for relevant corridors was only done for the total corridor riders, not station by station.

**EXHIBIT VIII-21**

**EASTERN CORRIDORS BOARDINGS BY STATION**

Corridor	Stations	Regional Rail Boardings	
		2007	2030
E-2	Downtown Denton	390	570
	Medical Center	570	960
	Lewisville North/FM407	580	750
	Lewisville CBD	590	680
	Lewisville South*	1,190	1,440
	Downtown Carrollton/Belt Line	1,010	1,340
	<b>Line Ridership</b>	<b>4,330</b>	<b>5,740</b>
	E-3	McKinney Central LRT/RR	250
	McKinney North	350	1,076
	Fairview/FM1378	760	1,233
	Stacy	440	696
	FM2170	1,300	1,565
	Legacy Drive	250	237
	Spring Creek	680	757
	Parker Road	920	1,139
	<b>Line Ridership</b>	<b>4,950</b>	<b>7,085</b>
E-4	Frisco North	390	1,400
	Frisco CBD/FM 720	550	1,200
	South Frisco	490	570
	Hebron	670	900
	Windhaven/Austin	190	300
	Downtown Carrollton/Belt Line	730	1,200
	<b>Line Ridership</b>	<b>3,020</b>	<b>5,570</b>
E-5	Westmoreland	932	1,399
	Camp Wisdom/Main	498	582
	Cedar Hill CBD	494	695
	Cedar Hill/Midlothian/Lo	55	109
	Midlothian Central	142	380
	<b>Line Ridership</b>	<b>2,121</b>	<b>3,165</b>
E-6	Union Station	1,180	1,740
	Loop12/Walton Walker	190	250
	IH-20/Langdon	90	140
	Lancaster CBD	640	780
	Red Oak	320	500
	Waxahachie/287	160	400
	Waxahachie CBD	160	220
	<b>Line Ridership</b>	<b>2,740</b>	<b>4,030</b>

Source: NCTCOG-DFWRTM-Final Run Recommended Alternative

**EXHIBIT VIII-22**

**WESTERN CORRIDORS BOARDINGS BY STATION**

Corridor	Stations	Regional Rail Boardings	
		2007	2030
W-1	ITC Terminal	1,780	2,010
	Texas Wesleyan	410	430
	Oakland/Rosedale	730	770
	Handley/SH180	440	510
	Cooks Lane	750	1,000
	Arlington UTA Center	690	710
	SH 360	1,190	1,400
	Grand Prairie	480	530
	NAS	280	340
	Westmoreland	460	540
	Union Station	2,700	3,400
	<b>Line Ridership</b>	<b>9,910</b>	<b>11,640</b>
	W-2	North DFW	460
Grapevine Main		390	450
Colleyville		170	200
DFW 13 <sup>th</sup> Station		930	1,250
Main/Davis		480	520
Loop 820/North Richland Hills		530	570
Beach/Meacham		380	490
Stockyard/28 <sup>th</sup>		550	630
ITC Terminal		1,700	1,920
T&P Building		340	380
Medical (Penn/Summit)		560	630
Berry/TCU		520	620
Seminary		440	500
Hulen		480	670
<b>Line Ridership</b>		<b>7,930</b>	<b>9,400</b>
W-4	ITC Terminal	980	1,440
	T&P Building	340	470
	Medical	300	350
	Berry/TCU	150	220
	IH 820/McCart	290	380
	Sycamore School Rd	680	890
	Crowley Main St.	320	520
	Joshua	70	200
	Cleburne North	30	120
	Cleburne Intermodal Terminal	120	250
	Burleson	50	130
<b>Line Ridership</b>	<b>3,330</b>	<b>4,970</b>	

Source: NCTCOG-DFWRTM-Final Run Recommended Alternative

## **PERFORMANCE EVALUATION**

Exhibit VIII-23 includes a summary of the performance for each corridor, based on the final recommendations for the project and using the performance indicators presented earlier in this chapter. Interim versions of this table are contained in the accompanying CD-ROM, as part of the various presentations that were offered to the Policy / Technical Committees throughout the project.

EXHIBIT VIII-23

PERFORMANCE SUMMARY BY CORRIDOR

Evaluation Criteria	E-2 Regional Rail	Score	E-3 Regional Rail	Score	E-3 Light Rail	Score	E-4 Regional Rail	Score	E-5 Regional Rail	Score	E-6 Regional Rail	Score	W-1 Regional Rail	Score	W-2 Regional Rail	Score	W-4 Regional Rail	Score
<b>Performance Benchmark</b> (Annual cost per annual rider) (see pg. VIII-15)	\$10.37	5	\$6.75	5	\$8.90	4	\$7.50	4	\$14.55	4	\$17.98	4	\$10.40	5	\$10.62	5	\$12.49	5
<b>Total Daily Ridership Forecast</b>	6,200	4	9,600	4	9,600	4	6,500	3	3200	2	4,000	3	11,600	5	9,400	4	5,000	3
<b>One-way Trip Time (minutes)</b>	39	5	28	5	33	4	33	5	32	5	53	5	47	3	61	2	52	3
<b>Estimated Capital Cost (millions)</b>	\$238.60	5	\$234.70	5	\$312.80	4	\$161.40	5	\$169.50	5	\$265.70	4	\$434.9M	3	\$366.10	3	\$229.6M	3
<b>Estimated annual O&amp;M Cost (millions)</b>	\$11.50	4	\$7.40	4	\$11.00	3	\$9.40	5	\$9.10	4	\$13.80	5	\$15.6M	3	\$21.2M	2	\$15.0M	3
<b>Local Authority and Funding</b>	DCTA org. exists and funding is available.	5	None	1	None	1	None	1	None	1	None	1	None	1	None	1	None	1
<b>Community Acceptance</b>	Community has approved sales tax to fund regional rail type system	5	Community may be open to acceptance of regional rail type service.	3	Community may be open to acceptance of light rail.	3	Community may be open to acceptance of regional rail type service.	3	Community may be open to acceptance of regional rail type service.	3	Community may be open to acceptance of regional rail type service.	3	Community is open to acceptance of regional rail service.	4	Communities are open to acceptance of regional rail service.	5	Communities are open to acceptance of regional rail type service.	5
<b>Ease of Implementation</b>	Right-of-way is owned and controlled by Denton County and DART. Relocation of trail will be necessary before track can be constructed.	4	DART owns right-of-way and controls local freight operations.	5	Light rail requires separate tracks or FRA approved time separation.	4	Use of right-of-way must be negotiated with the BNSF.	4	Use of right-of-way must be negotiated with the BNSF.	4	Use of right-of-way must be negotiated with the BNSF and the UP. Flyover of the UP will be required at Forest Avenue.	2	UPRR owns ROW and Tower 55 congestion restricts capacity.	1	DART and FW&W own ROW.	4	BNSF and FW&W own ROW.	4

Evaluation Criteria	E-2 Regional Rail	Score	E-3 Regional Rail	Score	E-3 Light Rail	Score	E-4 Regional Rail	Score	E-5 Regional Rail	Score	E-6 Regional Rail	Score	W-1 Regional Rail	Score	W-2 Regional Rail	Score	W-4 Regional Rail	Score	
<b>Connectivity with Existing and Planned Transit Operations</b>	Regional rail will require transfer to DART at Carrollton for some route choices.	3	Regional rail will require transfer to DART at Plano.	2	Light rail allows interlining with DART in Plano without transfers.	5	Regional rail will require transfer to DART at Carrollton for some route choices.	4	Regional rail will require transfer to DART at Westmoreland.	4	Regional rail will access Dallas Union Station and could be interlined with the TRE if practical.	4	Regional rail allows interlining with TRE and DART LRT, and transfers to buses.	5	Regional rail allows interlining with TRE, transfers with The T, and connects to DFW APM.	5	Regional rail allows interlining with TRE and transfers with The T.	4	
<b>Compatibility with Freight Railroad Operations</b>	Compliant regional rail is compatible with local freight operations.	5	Compliant regional rail is compatible with local freight operations.	5	Not compatible with freight operations unless time separated and FRA waiver approved.	2	Regional rail equipment is compatible.	3	Regional rail equipment is compatible.	4	Regional rail equipment will have to be compliant to be compatible.	4	Compliant regional rail is compatible with freight RR operations.	4	Compliant regional rail is compatible with freight railroad operations.	5	Compliant regional rail is compatible with freight railroad operations.	4	
<b>Serves area of unmet mobility need</b>	Roadway capacity deficiency moderately severe	2	Serves area of the most severe capacity deficiency	5	Serves area of the most severe capacity deficiency	5	Serves area of severe capacity deficiency	4	Roadway capacity deficiency not severe	1	Roadway capacity deficiency not severe	1	Roadway capacity deficiency low to moderately severe	2	Roadway capacity deficiency low to moderately severe	2	Roadway capacity deficiency low to moderately severe	2	
<b>Impact Upon Adjacent Highways and Air Quality (see pg. III-1 for explanation)</b>	Benefit to adjacent highway is equivalent to 1-lane in each direction	4	Benefit to adjacent highway is equivalent to 1-lane in each direction.	4	Benefit to adjacent highway is equivalent to 1-lane in each direction.	4	Benefit to adjacent highway is equivalent to 1-lane in each direction.	4	Benefit to adjacent highway is equivalent to 1-lane in each direction	4	Benefit to adjacent highway is equivalent to 1-lane in each direction	4	Transit benefit to highway is equivalent to 2-lanes in each direction on adjacent freeway.	5	Transit benefit to highway is equivalent to 1-lane in each direction on the adjacent freeway.	4	Transit benefit to highway is equivalent to 1-lane in each direction on the adjacent freeway.	4	
<b>Transit Oriented Development Potential</b>	TOD potential exists.	2	TOD potential exists.	2	TOD potential exists.	2	TOD potential exists.	2	TOD potential exists but is likely to develop slowly as on TRE.	2	TOD potential exists but is likely to develop slowly as on TRE.	2	TOD potential exists but is likely to develop slowly as on TRE.	3	TOD potential exists but is likely to develop slowly as on TRE.	3	TOD potential exists but is likely to develop slowly as on TRE.	3	
<b>TOTAL SCORE</b>		<b>53</b>		<b>50</b>		<b>47</b>		<b>46</b>		<b>43</b>		<b>42</b>		<b>44</b>		<b>45</b>		<b>44</b>	
																			<b>44</b>

The following section describes the performance of each corridor, relating the various indicators to the overall score received. This same information is shown in tabular form in Exhibit VIII-23. The order in which they are listed is not significant.

### E-2 DART/MKT Carrollton to Denton Corridor-Regional Rail

The E-2 Corridor scored the highest of all corridors included in the evaluation, with a total of 53 points. The Performance Benchmark was \$10.37 (score = 5 points), based on a total daily ridership forecast of 6,200 daily riders (score = 4 points) and an estimated annual operating and maintenance cost of \$11.5 million (score = 4 points). The total capital cost for the development of regional rail in this corridor was estimated to be \$238.60 million (score = 5 points). Estimated trip time to travel one-way the length of the corridor is 39 minutes (score = 5). The project has the advantage of the existence of a local authority, with the Denton County Transportation Authority being in place to develop and financially support the project (score = 5 points). Community Acceptance is clear by the presence of the transportation authority (score = 5 points). The right-of-way is owned and controlled by DART and the City of Denton, making implementation relatively straightforward, but there is a bicycle/pedestrian trail in a portion of the corridor that will have to be relocated (score = 4 points). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will require a transfer to the DART system at Carrollton to access other transit options in the region (score = 3 points), but is compatible with local freight operations (score = 5 points). The roadway capacity deficiency in the parallel corridor is moderately severe, so the E-2 regional rail implementation would moderately assist with unmet mobility needs (score = 2 points). However, the ridership projections for the corridor are equivalent to one lane of vehicular

traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points).  
Some transit oriented development potential exists (score = 2 points).

### E-3 DART Plano to McKinney Corridor – Regional Rail/Intermediate Light Rail

The E-3 Corridor was considered as both a Regional Rail Corridor and an Intermediate Light Rail Corridor. Given the presence of DART Light Rail to Plano, the ability to extend a single track Light Rail line north to McKinney was considered feasible. This corridor scored well under both technology scenarios, with a total of 50 points for Regional Rail and 47 points for Light Rail.

The Regional Rail Performance Benchmark was \$6.75 (score = 5 points), based on a total daily ridership forecast of 9,600 daily riders (score = 4 points) and an estimated annual operating and maintenance cost of \$7.4 million (score = 4 points). The total capital cost for the development of regional rail in this corridor was estimated to be \$234.70 million (score = 5 points). Estimated trip time to travel the length of the corridor is 28 minutes (score = 5 points). The project has no existing transit authority or funding designated for it at this time (score = 1 point), but the surrounding community may be open to accepting a regional rail type of service (score = 3 points). The right-of-way is owned and controlled by DART, making implementation relatively straightforward (score = 5 points). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will require a transfer to the DART system at Plano in order to access other transit options in the region (score = 2 points), but is compatible with local freight operations (score = 5 points). The roadway capacity deficiency in the parallel corridor is severe, so the E-3 regional rail implementation would assist with unmet mobility needs (score = 5 points). The ridership projections for the corridor are equivalent

to one lane of vehicular traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points). Some transit oriented development potential exists (score = 2 points).

The Light Rail Performance Benchmark was \$8.90 (score = 4 points), based on a total daily ridership forecast of 9,600 daily riders (score = 4 points) and an estimated annual operating and maintenance cost of \$11 million (score = 3 points). The total capital cost for the development of a single track light rail operation in this corridor was estimated to be \$312.8 million (score = 4 points). Estimated trip time to travel the length of the corridor via light rail is 33 minutes (score = 4 points). The project has no existing transit authority or funding designated for it at this time (score = 1 point), but the surrounding community may be open to accepting a light rail type of service (score = 3 points). Light rail requires separate tracks or FRA approved time separation (score = 4 points), but would allow for interlining with the DART system without any transfer required (score = 5 points). Light rail would not be compatible with freight operations in the corridor unless time separated and FRA waiver approved (score = 2 points). The roadway capacity deficiency in the parallel corridor is severe, so the E-3 light rail implementation would assist with unmet mobility needs (score = 5 points). The ridership projections for the corridor are equivalent to one lane of vehicular traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points). Some transit oriented development potential exists (score = 2 points).

#### E-4 BNSF Carrollton to Frisco

The E-4 Corridor scored 46 points in the overall evaluation. The Performance Benchmark was \$7.50 (score = 4 points), based on a total daily ridership forecast of

6,500 riders (score = 3 points). The costs for the corridor include an estimated annual operating and maintenance cost of \$9.40 million (score = 5 points) and total capital cost for regional rail development of \$161.40 million (score = 5 points). Estimated trip time to travel one way, the length of the corridor is 33 minutes (score = 5 points). The project has no existing transit authority or funding designated for it at this time (score = 1 point), but the community may be open to a regional rail service (score = 3 points). The right-of-way must be negotiated with the BNSF Railroad (score = 4 points). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will require a transfer to the DART system at Carrollton in order to access other transit options in the region (score = 4 points), but is compatible with local freight operations (score = 3 points). The roadway capacity deficiency in the parallel corridor is severe, so the E-4 regional rail implementation would assist with unmet mobility needs (score = 4 points). The ridership projections for the corridor are equivalent to one lane of vehicular traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points). Some transit oriented development potential exists (score = 2 points).

#### E-5 BNSF Duncanville to Midlothian

The E-5 Corridor scored 43 points in the overall evaluation. The Performance Benchmark was \$14.55 (score = 4 points), based on a total daily ridership forecast of 3,200 daily riders (score = 2 points). The costs for the corridor include an annual operating and maintenance cost of \$9.10 million (score = 4 points) and a total capital cost for development of regional rail in this corridor of \$169.50 million (score = 5 points). Estimated trip time to travel one way, the length of the corridor is 32 minutes (score = 5 points). The project has no existing transit authority or funding designated for it at this time (score = 1 point), but the community may be open to a regional rail service (score =

3 points). The right-of-way must be negotiated with the BNSF Railroad (score = 4 points). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will require a transfer to the DART system at Westmoreland in order to access other transit options in the region (score = 4 points), but is compatible with local freight operations (score = 4 points). The roadway capacity deficiency in the parallel corridor is not severe (score = 1 point), but the ridership projections equal one lane of vehicular traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points). Some transit oriented development exists, but would most likely come along slowly (score = 2 points).

#### E-6 BNSF Dallas to Waxahachie

The E-6 Corridor scored 42 points in the overall evaluation. The Performance Benchmark was \$17.98 (score = 4 points), based on a total daily ridership forecast of 4,000 daily riders (score = 3 points). The costs for the corridor include an annual operating and maintenance cost of \$13.80 million (score = 5 points) and a total capital cost for development of regional rail in this corridor of \$265.70 million (score = 4 points). Estimated trip time to travel one way, the length of the corridor is 53 minutes (score = 5 points). The project has no existing transit authority or funding designated for it at this time (score = 1 point), but the community may be open to a regional rail service (score = 3 points). Use of the right-of-way must be negotiated with the BNSF and the UP Railroads and a flyover rail to rail connection will be required of the UP at Forest Avenue in Dallas (score = 2). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will make it compatible with freight operations (score = 4) and require a transfer to the DART system at Union Station for light rail access, but could allow for an interlined operation with the Trinity Railway Express (score = 4 points).

The roadway capacity deficiency in the parallel corridor is not severe (score = 1 point), but the ridership projections equal one lane of vehicular traffic in each direction, thereby aiding air quality efforts in the region (score = 4 points). Some transit oriented development exists, but would most likely come along slowly (score = 2 points).

### W-1 UP Fort Worth – Dallas

The W-1 Corridor scored 44 points in the overall evaluation. The Performance Benchmark was \$10.40 (score = 5 points), based on a total daily ridership forecast of 11,600 daily riders (score = 5 points). The costs for the corridor include an annual operating and maintenance cost of \$15.6 million (score = 3 points) and a total capital cost for development of regional rail in this corridor of \$434.9 million (score = 3 points). Estimated trip time to travel one way, the length of the corridor is 47 minutes (score = 3 points). The project has local authority involvement on the east and west ends and the community is open to a regional rail service (score = 4 points), but has no existing transit authority or funding designated for it at this time (score = 1 point). Use of the right-of-way must be negotiated with the UP Railroad and the Tower 55 congestion in Fort Worth will restrict capacity (score = 1 point). Use of Federal Railroad Administration (FRA) compliant regional rail technology in the corridor will make it compatible with freight operations (score = 4 points) and require a transfer to the DART system at Union Station for light rail access, but could allow for an interlined operation with the Trinity Railway Express (score = 5 points). The roadway capacity deficiency in the parallel corridor is moderately severe (score = 2 points), but the ridership projections are equivalent to two lanes of vehicular traffic in each direction. This provides a good air quality benefit (score = 5 points). Some transit oriented development exists in the corridor (score = 3 points).

### W-2 FW&W/ Cotton Belt

The W-2 Corridor scored 45 points in the overall evaluation. The Performance Benchmark was \$10.62 (score = 5 points), based on a total daily ridership forecast of 9,400 daily riders (score = 4 points). The costs for the corridor include an annual operating and maintenance cost of \$21.2 million (score = 2 points) and a total capital cost for development of regional rail in this corridor of \$366.1 million (score = 3 points). Estimated trip time to travel one way, the length of the corridor is 61 minutes (score = 2 points). The project has local authority involvement on the western end of the corridor and the communities along the rest of the corridor appear to be open to a regional rail service (score = 5 points), but has no existing transit authority or funding designated for it at this time other than in Fort Worth (score=1 point). The right-of-way is owned by DART and the FW&W Railroad (score = 4 points), so use of the corridor is negotiable. Use of FRA compliant regional rail technology in the corridor will make it compatible with freight operations (score = 5 points) and allow for interlining with Trinity Rail Express, along with other connections with The T in Fort Worth and the Dallas/Fort Worth International airport on the eastern end (score = 5 points). The roadway capacity deficiency in the parallel corridors is moderately severe (score = 2 points) and the ridership generated is equivalent to one lane of vehicular traffic in each direction. This provides a good benefit to air quality (score = 4 points). Transit oriented development is likely to develop slowly in this corridor, as it has in the Trinity Railway Express corridor (score = 3 points).

### W-4 BNSF Fort Worth to Cleburne

The W-4 Corridor scored 44 points in the overall evaluation. The Performance Benchmark was \$12.49 (score = 5 points), based on a total daily ridership forecast of

5,000 daily riders (score = 3 points). The costs for the corridor include an annual operating and maintenance cost of \$15.0 million (score = 3 points) and a total capital cost for development of regional rail in this corridor of \$229.6 million (score = 3 points). Estimated trip time to travel one way, the length of the corridor is 52 minutes (score = 3 points). The project has local authority involvement on the northern end of the corridor and the communities along the rest of the corridor appear to be open to regional rail service (score = 5 points), but has no existing transit authority or funding designated for it at this time (score = 1 point). The right-of-way must be negotiated with the BNSF and FW&W railroads (score = 4 points). Use of FRA compliant regional rail technology in the corridor will make it compatible with freight operations (score = 4 points) and allow for interlining with Trinity Railway Express (score = 4 points). The roadway capacity deficiency in the parallel corridor is moderately severe (score = 2 points) and the ridership generated is equivalent to one lane of vehicular traffic in each direction. This provides a good benefit to air quality (score = 4 points). Transit oriented development is likely to develop slowly in this corridor, as it has in the Trinity Railway Express corridor (score = 3 points).