ACTIVITIES TO DATE

• July 2003
  – First Committee Meetings/Study Orientation
• September 2003
  – Technology Evaluation Criteria
  – Station Location Analysis
  – Orientation to the Corridors (Infrastructure)
• November 2003
  – Technology Applications in Corridors
  – Station Prototypical Layouts
  – Land Use Status Report
  – Freight Bottleneck Study Update
  – Transportation Authority Update
• March 2004
  – Consideration of Regional Rail Alternatives
  – Discussion of Non-Rail Transit Services
  – Opportunities for Transit Oriented Development
• June 2004
  – Consideration of Regional Rail, Light Rail, Bus Rapid Transit Alternatives
  – Discussion of Estimated Costs, Ridership, Benchmarks
  – Discussion of Non-Rail Transit Services
  – Opportunities for Transit Oriented Development
TODAY’S AGENDA

• Presentation of Corridor Recommendations for the W-1 Corridor (30 min.)
  – Introduction and Project Overview
  – Assumptions and Refinements
  – Recommendations (Rail and Non-Rail)
  – Transit Oriented Development Financing

• Discussion of Proposed Services (30 min.)

• At-Grade Railroad Crossings and Quiet Zones (10 min.)

• Implementation of Regional Rail System Service (15 min.)
  – Status of Regional Transit Initiative Efforts
  – Opportunities to View Evolving Rail Technology
CONSENSUS PROCESS: A “Bottom-Up” Approach

- PROVIDE OPTIONS TO LEGISLATURE
  - David Cain
- EVALUATE INSTITUTIONAL STRUCTURES
  - Lee Jackson
- MATCH REVENUES TO NEEDS
- IDENTIFY CAPITAL AND OPERATING COSTS
- TRANSIT RELATED NEEDS
- EVALUATE FINANCING OPTIONS
  - Wendy Davis
COST ESTIMATES

- Estimates Are Based on Unit Costs for Each Element

- Cost Elements
  - Site Work, Utilities and Urban Design
  - Traction Electrification System [Light Rail Transit (LRT) Only]
  - Crossings/Roadway/Signal System
  - Trackwork
  - Structures
  - Stations
  - Vehicles
  - Other

- Extraordinary Real Estate or Railroad Agreements Not Included
2030 RIDERSHIP FORECASTS

- Performed by NCTCOG Transportation Department Staff Using DFW Regional Travel Model
- Uses Regionally Approved 2030 Demographic Forecasts
REGIONAL RAIL TECHNOLOGY

Vehicle Types for Possible Use in Corridor W-1
PERFORMANCE

• Preliminary Performance Benchmark Methodology Uses:
  – Estimate of Cost
    • Considers Useful Life, Annualization, Total Construction Costs (including contingencies)
  – Estimate of Daily Riders
• Reflects Most Factors Used in Federal Transit Administration Evaluation
PROPOSAL FOR W-1 CORRIDOR

• Regional Rail Service – Same as Presented Previously

• Feeder Bus Service Modified in Select Locations

• Stations:
  – Moved Beltline Station Area to NAS
  – Added Grand Prairie Station Area at SH161
  – Moved Six Flags/Division Station Area to SH 360
  – Moved Arlington/UTA Station Area from Center to West Avenue
  – Add Special Events Service to Ballpark

• Ridership Results Based on Modeling Full Regional Rail System
RECOMMENDED NON-RAIL ELEMENTS

At Local Discretion, Provision for:
- Feeder Bus Service
- Demand Response Service
- Express Service/Park ‘n Ride
- Bottleneck Improvements
- Air Quality Projects
W-1 CORRIDOR
Regional Rail

NOTE: Stations are General Vicinity Locations for Modeling Purposes Only

Regional Rail Corridor Study
Alignment W-1 Regional Rail

Legend:
- Regional Rail Stations
- Special Event Station
- Alignment W-1 (UTRR)
- Major Arterials

0 10,000 20,000 30,000 ft

DRAFT
<table>
<thead>
<tr>
<th></th>
<th>Regional Rail</th>
<th>Light Rail</th>
<th>Bus Rapid Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Cost</strong></td>
<td>$426.4M</td>
<td>$1,452.4M</td>
<td>$1,389.7M</td>
</tr>
<tr>
<td></td>
<td>[$13.6M per mile]</td>
<td>[$52.0M per mile]</td>
<td>[$48.0M per mile]</td>
</tr>
<tr>
<td><strong>Estimated Daily Ridership</strong></td>
<td>13,500 to 16,500 Average Daily Riders</td>
<td>29,520 to 36,080 Average Daily Riders</td>
<td>20,160 to 24,640 Average Daily Riders</td>
</tr>
<tr>
<td><strong>Performance Benchmark (Cost Effectiveness)</strong></td>
<td>$7.87 to $10.27 Annual Cost per Rider</td>
<td>$12.02 Annual Cost per Rider</td>
<td>$18.88 Annual Cost per Rider</td>
</tr>
</tbody>
</table>

CEI calculations are preliminary and do not include railroad ROW purchase or real estate.

*The transit benefit to highway is equivalent to 1-lane in each direction on the adjacent freeway.*
W-1 CORRIDOR
Final Summary Data

<table>
<thead>
<tr>
<th></th>
<th>Regional Rail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital Cost</strong></td>
<td>$434.9M [$13.8M per mile]</td>
</tr>
<tr>
<td><strong>Estimated Daily Ridership</strong></td>
<td>11,600 Average Daily Riders</td>
</tr>
<tr>
<td><strong>Performance Benchmark</strong></td>
<td>$10.40 Annual Cost per Rider</td>
</tr>
<tr>
<td><em>(Cost Effectiveness)</em></td>
<td></td>
</tr>
</tbody>
</table>

CEI calculations are preliminary and do not include railroad row purchase or real estate.

The transit benefit to highway is equivalent to 1-lane in each direction on the adjacent freeway.
## W-1 Corridor Evaluation

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>W-1 Regional Rail</th>
<th>W-1 Light Rail</th>
<th>W-1 Bus Rapid Transit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Benchmark (Ann. cost per rider)</td>
<td>$7.87 to $10.27</td>
<td>$12.02</td>
<td>$18.88</td>
</tr>
<tr>
<td>Average Daily Ridership Forecast</td>
<td>13,500 to 16,500</td>
<td>29,520 to 36,080</td>
<td>20,160 to 24,640</td>
</tr>
<tr>
<td>One-way Trip Time (minutes)</td>
<td>47</td>
<td>68</td>
<td>95</td>
</tr>
<tr>
<td>Estimated Capital Cost (millions)</td>
<td>$426.4M [$13.6M per mile]</td>
<td>$1,452.4M [$52.0M per mile]</td>
<td>$1,389.7M [$48.0M per mile]</td>
</tr>
<tr>
<td>Estimated Annual O&amp;M Cost (millions)</td>
<td>$15.6M</td>
<td>$20.3M</td>
<td>$28.1M</td>
</tr>
<tr>
<td>Local Authority and Funding</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Community Acceptance</td>
<td>Community is open to acceptance of regional rail service.</td>
<td>Community may have limited acceptance of light rail due to cost.</td>
<td>Community may have limited acceptance of BRT.</td>
</tr>
<tr>
<td>Ease of Implementation</td>
<td>UPRR owns ROW and Tower 55 congestion restricts capacity.</td>
<td>LRT requires separate tracks in US180 ROW owned by TxDOT.</td>
<td>BRT requires separate guideway in US180 ROW owned by TxDOT.</td>
</tr>
</tbody>
</table>

Score: 1 = very bad, 5 = very good.
<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>W-1 Regional Rail</th>
<th>Score</th>
<th>W-1 Light Rail</th>
<th>Score</th>
<th>W-1 Bus Rapid Transit</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectivity with Existing and Planned Transit Operations</td>
<td>Regional rail allows interlining with TRE and DART LRT, and transfers to buses.</td>
<td>5</td>
<td>LRT allows interlining with DART LRT at Westmoreland and transfers to buses.</td>
<td>4</td>
<td>BRT allows transfers to local buses.</td>
<td>2</td>
</tr>
<tr>
<td>Compatibility with Freight Railroad Operations</td>
<td>Compliant regional rail is compatible with freight railroad operations.</td>
<td>4</td>
<td>Use of US 180 ROW allows LRT operation that would otherwise not be compatible with freight operations.</td>
<td>3</td>
<td>Use of US 180 ROW allows BRT operation that would otherwise not be compatible with freight operations.</td>
<td>3</td>
</tr>
<tr>
<td>Serves area of unmet mobility need</td>
<td>Roadway capacity deficiency low to moderately severe</td>
<td>2</td>
<td>Roadway capacity deficiency low to moderately severe</td>
<td>2</td>
<td>Roadway capacity deficiency low to moderately severe</td>
<td>2</td>
</tr>
<tr>
<td>Impact Upon Adjacent Highways, Automobile Traffic, and Air Quality</td>
<td>Transit benefit to highway is equivalent to 2-lanes in each direction on adjacent freeway.</td>
<td>5</td>
<td>Transit benefit to highway is equivalent to 2-lanes in each direction on adjacent freeway.</td>
<td>5</td>
<td>Transit benefit to highway is equivalent to 2-lanes in each direction on adjacent freeway.</td>
<td>5</td>
</tr>
<tr>
<td>Transit Oriented Development Potential</td>
<td>TOD potential exists but is likely to develop slowly as on TRE.</td>
<td>3</td>
<td>TOD potential is good</td>
<td>4</td>
<td>TOD potential exists.</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td></td>
<td>44</td>
<td></td>
<td>38</td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>

Score: 1 = very bad, 5 = very good.
### Evaluation Criteria: Regional Rail Score

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Regional Rail</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectivty with Existing and Planned Transit Operations</td>
<td>Regional rail allows interlining with TRE and DART LRT, and transfers to buses.</td>
<td>5</td>
</tr>
<tr>
<td>Compatibility with Freight Railroad Operations</td>
<td>Compliant regional rail is compatible with freight RR operations.</td>
<td>4</td>
</tr>
<tr>
<td>Serves area of unmet mobility need</td>
<td>Roadway capacity deficiency low to moderately severe</td>
<td>2</td>
</tr>
<tr>
<td>Impact Upon Adjacent Highways, Automobile Traffic, and AQ</td>
<td>Transit benefit to highway is equivalent to 2-lanes in each direction on adjacent freeway</td>
<td>5</td>
</tr>
<tr>
<td>Transit Oriented Development Potential</td>
<td>TOD potential exists but is likely to develop slowly as on TRE.</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL SCORE</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

Score: 1 = very bad, 5 = very good.
* Based on Mobility 2025 - 2004 Update and Refinements through the Regional Rail Corridor Study
## DEMAND FOR RAIL SERVICE

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Near-Term</th>
<th>Long-Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-2 – Denton/Carrollton</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>E-3 – McKinney/Dallas</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>E-4 – Frisco/Carrollton</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>E-5 – Dallas/Midlothian</td>
<td>Yes, Phased Service in Ellis County</td>
<td>Yes</td>
</tr>
<tr>
<td>E-6 – Dallas/Waxahachie</td>
<td>Yes, Phased Service in Ellis County</td>
<td>Yes</td>
</tr>
<tr>
<td>W-1 – Fort Worth/Dallas</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>W-2 – Fort Worth to D/FW Airport</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>W-4 – Fort Worth/Cleburne</td>
<td>Yes, Phased Service South of Sycamore School Road</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Planning and Zoning
Reduce cost of holding land for development by helping change planning and zoning in advance of private sector transit-oriented development proposals

Capital Planning
Advance planning and cost estimates to help local governments develop the public infrastructure necessary to incent a private sector investment in transit-oriented development.

Financial Planning
Help local governments develop financial tools to support public infrastructure
# Upcoming Transit-Oriented Development Implementation Events

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place Makers Smart Code Workshop</td>
<td>October 27 – 30</td>
</tr>
<tr>
<td>NCTCOG Transit-Oriented Development Workshop for Regional Rail Corridor Study/Regional Transit Initiative Participants</td>
<td>November 18</td>
</tr>
<tr>
<td>Land Use/Transportation Joint Venture Call for Projects</td>
<td>2004 - 2005</td>
</tr>
<tr>
<td>Urban Land Institute/Center Of Development Excellence Visioning Program</td>
<td>Spring, 2005</td>
</tr>
</tbody>
</table>
1. Maximizing Safety Through Capital Improvements

2. Linking Operations with Nearby Traffic Controls and Other Corridor Improvements

3. Minimizing Noise and Other Environmental Impacts Near Sensitive Land Uses

4. Enhancing the Reliability of Antiquated Equipment
AT-GRADE RAILROAD CROSSINGS
Recently Funded and Recommended Projects

Railroad Crossing Reliability Partnership Program

Eligible Applications Received
- Recommended for Funding
- Recommended for Consideration in Partnership Program Two
- Funded by TxDOT's Section 130 Program
- Not Recommended for Funding

Recently Funded
- Signalized with Section 130 Funds Through TxDOT
- Signalized with TxDOT (Dallas District) Discretionary Funds
- Closed by the City of Fort Worth
- Grade Separations Funded by NCTCOG Strategic Programming Initiative

Other Features
- At-Grade Railroad Crossings
- Railroads
- Regional Rail Corridor Study Corridors

Transportation Department
North Central Texas Council of Governments
QUIET ZONES / TRAIN HORN RULE

Basics

Federal Railroad Administration Published the Rule on December 18, 2003; it Goes Into Effect December 18, 2004

Intended to Enhance Safety and Reduce Train Horn Noise

Requires Trains Approaching Public Crossings to Sound a Horn to Provide a Warning (15-20 seconds)

Enables Communities to Establish Quiet Zones by Reducing the Risk Caused by Lack of Horns
QUIET ZONES / TRAIN HORN RULE
Measures Necessary to Establish a Quiet Zone

1. Closure or

2. Four Quadrant Gates or

3. One-Way Street with a Gate Across Width or

4. Channelization with Gates
QUIET ZONES / TRAIN HORN RULE

Other Considerations

Minimum Length: ½ mile

Wayside Horns May be Used with Gates (One-for-One Replacement of Train Horn)

Sample Quiet Zone on the Trinity Railway Express in Tarrant County: $6 million for a 16-mile-long corridor
QUIET ZONES / TRAIN HORN RULE

Next Steps on Railroad Crossings and Quiet Zones

1. Attend Upcoming FRA / NCTCOG Quiet Zone Workshop (date and location TBD)

2. Participate in Subregional Quiet Zone Planning

3. Identify Crossings for Closure

4. Participate in Funding Opportunities for Quiet Zones/Safety/Reliability

5. Work with NCTCOG Staff to Implement Targeted Safety Program in High Risk Areas
IMPLEMENTATION OF REGIONAL RAIL SYSTEM SERVICE
Status of Regional Transit Initiative Efforts

Vision:
To provide a bottom-up process for the exchange of information and ideas among elected representatives, policy officials, and the general public regarding options for the implementation of a seamless transit system for North Central Texas.

Purpose:
Create a consensus position for implementation of regional rail throughout North Central Texas.
COMMITTEE COORDINATION

Policy/Technical Committee Meetings (Committees 1 – 6)

Six Rounds of Meetings (36)
  July, September and November 2003
  March, May and August 2004

Regional Transit Initiative Meetings (Committees 8, 9 and 10)

Eight Rounds of Meetings (8)
  January, March, April (2), May, June, July, August 2004

Quarterly Public Meetings

Six Rounds of Meetings (18)
  July, August, October and December 2003
  March, June 2004

Committee 7 Meeting

May 20, 2004
INSTITUTIONAL COMMITTEE
Principles and Recommendations

1. Provision for Regional Rail in Six Counties
   √

2. Ability to Expand to Additional Counties as Needed
   √

3. Maintain three existing transit authorities with funding, responsibilities and commitments (DART, DCTA, FWTA)

4. Encourage transit service through regional cooperation

5. Provide seamless service to customer

6. Avoid extra layers of bureaucracy and duplicative services

7. Assure fair sharing of costs for transit services received

8. Structure governance representation fairly

9. Address equity issues; East and West
## Revenue Sources for Regional Rail Authority (RRA)

<table>
<thead>
<tr>
<th>Estimated RRA Capital and Operating Annualized Costs</th>
<th>Necessary Sales Tax Increase</th>
<th>Necessary Motor Fuels Sales Tax Rate</th>
<th>Necessary Motor Vehicle Sales Tax Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>$167.3M</td>
<td>1/2 Percent</td>
<td>6 3/8 Percent per gallon</td>
<td>2 3/8 Percent tax per sale</td>
</tr>
</tbody>
</table>

Includes possibility, at local discretion, of minimal feeder bus, air quality projects, bottleneck improvements, etc.
MULTIPLE FUNDING OPTIONS

Stand Alone Funding Approach: Raise Ceiling on Sales Tax Cap

Funding Partnerships:
1. Expand Sales Tax
2. Texas Mobility Fund
3. Motor Vehicle Sales Tax Increase
4. Traffic Impact Fees
   (Toll Revenue Unavailable)

Business as Usual:
1. Join Existing Authorities, if available
2. Contract Services with Existing Authorities
3. RTC Partnership Program
4. 4A/4B Local Government Reprioritization
Ellis
Collin
Dallas
Parker
Denton
Tarrant
Kaufman
Rockwall

1. DCTA Service Area*
   (.5¢ existing cities ; .5¢ proposed for entire county)
2. FWTA Service Area**
   (.5¢ existing + .5¢ proposed = 1¢ Total)
3. DART Service Area
   (1¢ existing ; 1¢ proposed)
4. Potential New Regional Rail Authority ***
   (.5¢ proposed)

- New Area Regional Rail
- Mobility 2025 - 2004 Update Rail Roadway

* DCTA will work with cities within the Service Area to provide funding necessary for implementation of transit activities within non-DART and non-FWTA portions of Denton County.

** FWTA preference for distribution of FWTA Regional Rail Authority sales-tax to that of the FWTA Service Area.

*** Flexibility including but not limited to the following:
- Creation of Regional Rail Authority Service Area
- Able to Partner with other Authorities
- Expand to Counties as Needed
- Minimal “Feeder” Bus Service
- Additional Funding Includes: Air Quality Projects, Local Match, Bottleneck Improvements, etc.

DRAFT
NEXT STEPS

Transit Summit – August 13, 2004

Legislative Committee plus “Tactical Plan Development”

Judges/Mayors North Texas Legislative Conference – Summer/Fall 2004

Legislative Committee chairpersons plus Governor, Lieutenant Governor, and Speaker of the House

Legislative Proposal – Fall 2004
OPPORTUNITIES TO FURTHER INVESTIGATE EVOLVING RAIL TECHNOLOGY

• American Public Transportation Association Expo in Dallas – September 26-28, 2005

• Colorado Railcar Tour, Fall 2004

• Examination of Other Systems in Service
New Railcar Technology Is Rolling Into North Central Texas

October 2004
REGIONAL RAIL CORRIDOR STUDY

• Contacts: Public Transportation Team
  – NCTCOG, Transportation Department
  – Christie Zupancic or Ruth Boward
    (817) 695-9240

• Website:
  – www.nctcog.org/rrcs