Cotton Belt Regional Rail Corridor Project

Public Meeting

November 2017
Meeting Focus

• Today’s discussion focuses on Impacts & Proposed Mitigation
• Large volume of material to cover
• Request that questions and comments address Impacts & Proposed Mitigation
• Please make use of comment cards
Agenda

• Alignment and Station Update
• Traffic Analysis and Mitigation
• Noise Impacts and Mitigation
• Vibration Impacts and Mitigation
• Visual Impacts and Mitigation
• Other Impacts and Mitigation
  – Historic-age Resources
  – Recreational Resource
Alignment & Station Update
Alignment & Stations

November 28, 2017 DART Board Meeting

• DART Board questioned the number of stations and how closely they were spaced
• DART Board suggested looking at an alternative location for the Coit Station.
Alignment & Stations

[Map showing various stations and rail lines in Dallas]
Coit Station Alternative Concept
Traffic Analysis and Mitigation
Traffic Analysis Status

• Draft Traffic Analysis is complete
• Draft Traffic Analysis Report has been provided to each city along corridor for review and comment
• Ongoing review of proposed mitigations
• Traffic Analysis recommendations subject to DART Board approval
Map of Existing At-Grade Crossings
Traffic Analysis Guidance

- Institute of Transportation Engineers (ITE) *Light Rail Transit Grade Separation Guidelines* (January 2003)
- Transportation Research Board *Highway Capacity Manual* (HCM, 2000)
- SYNCHRO Software Version 9.0
- DART Grade Separation Policy
Traffic Analysis

• 25 crossings advanced to level of service (LOS) and queue impact analysis
  – 13 crossings identified as ITE category 2 or 3 require additional analysis
  – 12 additional crossings identified for analysis based on proximity of nearby intersections to rail crossing:
    o East Belt Line, MacArthur, Luna, DNT Frontage Roads (2), Davenport (2), Hillcrest, Alma, PGBT Frontage Roads (2), K Avenue
Map of Traffic Analysis Locations
Summary of Preliminary Findings

<table>
<thead>
<tr>
<th>Roadway At-Grade Crossing</th>
<th>Location</th>
<th>LOS Impacts?</th>
<th>Queuing Impacts?</th>
<th>Recommended Traffic Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freeport Parkway</td>
<td>2</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>South Belt Line Road</td>
<td>5</td>
<td>Yes</td>
<td>Yes</td>
<td>Grade Separation</td>
</tr>
<tr>
<td>East Belt Line Road</td>
<td>6</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>MacArthur Boulevard</td>
<td>9</td>
<td>Yes</td>
<td>No</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td>Luna Road</td>
<td>12</td>
<td>Yes</td>
<td>Yes</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td>North Josey Lane</td>
<td>16</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>North Marsh Lane</td>
<td>19</td>
<td>Yes</td>
<td>Yes</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td>Midway Road</td>
<td>21</td>
<td>No</td>
<td>Yes</td>
<td>Grade Separation</td>
</tr>
<tr>
<td>Addison Road</td>
<td>22</td>
<td>Yes</td>
<td>Yes</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td>DNT SB Frontage Road</td>
<td>25</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>DNT NB Frontage Road</td>
<td>26</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
</tbody>
</table>

Note: All at-grade roadway crossings will be gated; residential areas will include quiet zones
## Summary of Preliminary Findings

<table>
<thead>
<tr>
<th>Roadway At-Grade Crossing</th>
<th>Location</th>
<th>LOS Impacts?</th>
<th>Queuing Impacts?</th>
<th>Recommended Traffic Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davenport Road (South)</td>
<td>28</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Campbell Road</td>
<td>29</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Davenport Road</td>
<td>30</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Hillcrest Road</td>
<td>31</td>
<td>No</td>
<td>No</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td>Coit Road</td>
<td>35</td>
<td>No</td>
<td>Yes</td>
<td>Grade Separation</td>
</tr>
<tr>
<td>Waterview Parkway</td>
<td>36</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Custer Parkway</td>
<td>37</td>
<td>Yes</td>
<td>Yes</td>
<td>Grade Separation</td>
</tr>
<tr>
<td>Alma Road</td>
<td>38</td>
<td>Yes</td>
<td>Yes</td>
<td>Signal/Design Improvements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Grade Separation Not Feasible)</td>
</tr>
<tr>
<td>PGBT EB Frontage Road</td>
<td>39</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>PGBT WB Frontage Road</td>
<td>40</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>K Avenue</td>
<td>41</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Municipal Avenue</td>
<td>42</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Jupiter Road</td>
<td>44</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>Plano Parkway</td>
<td>46</td>
<td>Yes</td>
<td>Yes</td>
<td>Grade Separation</td>
</tr>
</tbody>
</table>

Note: All at-grade roadway crossings will be gated; residential areas will include quiet zones.
Map of Preliminary Traffic Mitigation Locations

Legend

- Grade Separation
- Signal/Design Improvements
Map of Preliminary Traffic Mitigation Locations

- Grade Separation
- Signal/Design Improvements

Locations:
- Davenport
- Davenport S
- McCullum
- Meandering Way
- Hillcrest
- Coit
- Dickerson
Noise Impacts and Mitigation
Noise Analysis Status

- Draft Noise Analysis is complete
- Ongoing review of proposed mitigations
- Noise Analysis recommendations subject to DART Board approval
Noise Analysis and Mitigation

MITIGATION FOR NOISE IMPACTS IF WARRANTED

If Noise or Vibration Impacts are Identified, Mitigation Measures May Involve Treatments:

1. At the Noise Source,
2. Along the Source-to-Receiver Propagation Path, or
3. At the Receiver

Typical Noise Mitigation Techniques Include:

- Stringent transit vehicle and equipment noise specifications
- Rail vehicle treatments to minimize noise
- Quiet Zones to eliminate horn noise
- Installation of sound barriers (noise walls)
- Track treatments (e.g. moveable-point frogs and wayside rail lubricators)
- Enhanced maintenance
- Alignment modifications
- Insulation of affected buildings

Moveable-point frog
Noise Impact Analysis

• Majority of noise impacts associated with train horns at street crossings
  – 5,419 residential impacts without quiet zones
    o 3,090 are considered severe, rest are moderate
  – 19 institutional impacts without quiet zones
    o 10 severe; 9 moderate

• Quiet zones mitigate 96% of noise impacts:
  – Eliminates all severe and moderate institutional impacts
  – Eliminates all severe residential impacts
  – 235 moderate residential impacts remain to be mitigated if warranted (see handout)
Proposed Noise Mitigation
Quiet Zones in Residential Areas

Quiet Zone with Gates/Non-Mountable Barrier

Non-Mountable Barrier

Quiet Zone with Quad Gates
Noise Analysis Results (Without Quiet Zones)

Noise Legend
- Moderate < 3 dB impact
- Moderate > 3 dB impact
- Severe impact
Noise Analysis Results
(With Quiet Zones)

Noise Legend
- Moderate < 3 dB impact
- Moderate > 3 dB impact
- Severe impact
Proposed New Quiet Zones
(36 locations)

<table>
<thead>
<tr>
<th>Street</th>
<th>City</th>
<th>Street</th>
<th>City</th>
<th>Street</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coppell Rd</td>
<td>Coppell</td>
<td>Josey Ln</td>
<td>Carrollton</td>
<td>Dickerson Pkwy</td>
<td>Dallas</td>
</tr>
<tr>
<td>Southwestern Blvd</td>
<td>Coppell</td>
<td>Kelly Blvd</td>
<td>Carrollton</td>
<td>Waterview Pkwy</td>
<td>Richardson</td>
</tr>
<tr>
<td>Denton Tap</td>
<td>Coppell</td>
<td>Marsh Ln</td>
<td>Carrollton</td>
<td>Rufford Dr</td>
<td>Richardson</td>
</tr>
<tr>
<td>E Belt Line Rd</td>
<td>Coppell</td>
<td>Addison Rd</td>
<td>Addison</td>
<td>Alma Dr</td>
<td>Richardson</td>
</tr>
<tr>
<td>Moore Rd</td>
<td>Coppell</td>
<td>Quorum Dr</td>
<td>Addison</td>
<td>W CityLine Dr</td>
<td>Richardson</td>
</tr>
<tr>
<td>Mockingbird Ln</td>
<td>Coppell</td>
<td>Spectrum Dr</td>
<td>Addison</td>
<td>PBGT (EB)</td>
<td>Richardson</td>
</tr>
<tr>
<td>MacArthur Blvd</td>
<td>Coppell</td>
<td>Dallas Pkwy (NB/SB)</td>
<td>Addison</td>
<td>PBGT (WB)</td>
<td>Plano</td>
</tr>
<tr>
<td>Fairway Dr</td>
<td>Coppell</td>
<td>Knoll Trail</td>
<td>Dallas</td>
<td>10th St</td>
<td>Plano</td>
</tr>
<tr>
<td>Luna Rd</td>
<td>Carrollton</td>
<td>Davenport Rd (2)</td>
<td>Dallas</td>
<td>K Ave</td>
<td>Plano</td>
</tr>
<tr>
<td>IH 35E Access Rd (NB/SB)</td>
<td>Carrollton</td>
<td>Campbell Rd</td>
<td>Dallas</td>
<td>Municipal Ave</td>
<td>Plano</td>
</tr>
<tr>
<td>Broadway Dr</td>
<td>Carrollton</td>
<td>Hillcrest</td>
<td>Dallas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denton Dr</td>
<td>Carrollton</td>
<td>McCallum Blvd</td>
<td>Dallas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perry Rd</td>
<td>Carrollton</td>
<td>Meandering Way</td>
<td>Dallas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Per FRA rules, cities must apply for Quiet Zones. DART will include Quiet Zone mitigation costs as part of the project.
Examples of Noise Mitigation

Noise Barriers

Other mitigation examples include:

- Directional crossing bells
- Sound insulation
- Window glazing
- Other
Proposed Noise Wall Cross-Section

One Noise Barrier Wall

Two Noise Barrier Walls
Noise Impact Location Maps
Carrollton (East of Downtown Carrollton)

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Crossover mitigation options:
- Relocate crossover
- Crossover treatment
- Noise barrier

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Carrollton (West of Marsh Lane)

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Lakehill Townhomes

噪声影响位置图
Carrollton (西端Marsh Lane)

图例
- 红色：东行轨道
- 蓝色：西行轨道
- 黄色：货运轨道
- 绿色：特殊轨道工作

噪声图例
- 橙色：中等 < 3 dB
- 橙色：中等 > 3 dB
- 黑色：中等铃声 < 3 dB
- 黑色：中等铃声 > 3 dB
- 青色：中等列车/铃声 > 3 dB
- 棕色：拟议噪声屏障
- 粉色：拟议安静区
- 粉色：拟议安静区和交叉口铃声缓解

* *
Noise Impact Location Maps
Carrollton (At Marsh Lane)

Willow Lane Condominiums

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work
Noise Impact Location Maps
Addison (At Spectrum Dr)

Addison Circle Apartments

Noise Legend
- ○ Moderate < 3 dB
- ○ Moderate > 3 dB
- ○ Moderate Bell < 3 dB
- ○ Moderate Bell > 3 dB
- ○ Moderate Train/Bell > 3 dB
- ⌂ Proposed Noise Barrier
- ⚫ Proposed Quiet Zone
- ⚫ Proposed Quiet Zone and Crossing Bell Mitigation

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Green: Freight track
- Light Green: Special track work
Noise Impact Location Maps
Dallas (At Knoll Trail Dr)

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Noise Legend
- ○: Moderate < 3 dB
- ○: Moderate > 3 dB
- ●: Moderate Bell < 3 dB
- ●: Moderate Bell > 3 dB
- ●: Moderate Train/Bell > 3 dB
- ■: Proposed Noise Barrier
- ◆: Proposed Quiet Zone
- *: Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Dallas (East of Knoll Trail Dr)

Adair II Apartments
Noise Impact Location Maps
Dallas (West of Preston Rd)

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation

Track Legend
- Eastbound track
- Westbound track
- Freight track
- Special track work

Track Legend
- Eastbound track
- Westbound track
- Freight track
- Special track work
Noise Impact Location Maps
Dallas (East of Preston Rd)
Noise Impact Location Maps
Dallas (South of Campbell)

Track Legend
- Eastbound track
- Westbound track
- Freight track
- Special track work

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Dallas (At Campbell)

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Dallas (Campbell to Davenport)
Noise Impact Location Maps
Dallas (At Davenport)

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Noise Legend
- ●: Moderate < 3 dB
- ○: Moderate > 3 dB
- ○: Moderate Bell < 3 dB
- ●: Moderate Bell > 3 dB
- X: Moderate Train/Bell > 3 dB
- Pink Line: Proposed Noise Barrier
- Grey *: Proposed Quiet Zone
- Purple *: Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Dallas (Davenport to Hillcrest)
Noise Impact Location Maps
Dallas (Hillcrest/McCallum/Meandering Way)

Track Legend
- Eastbound track
- Westbound track
- Freight track
- Special track work

Noise Legend
- Moderate < 3 dB
- Moderate > 3 dB
- Moderate Bell < 3 dB
- Moderate Bell > 3 dB
- Moderate Train/Bell > 3 dB
- Proposed Noise Barrier
- Proposed Quiet Zone
- Proposed Quiet Zone and Crossing Bell Mitigation
Noise Impact Location Maps
Dallas (East of Coit Rd)
## Residential Noise Impact Summary

<table>
<thead>
<tr>
<th>City</th>
<th>Without Quiet Zones</th>
<th>Quiet Zones without Additional Mitigation</th>
<th>Quiet Zones with Additional Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate</td>
<td>Severe</td>
<td>Moderate</td>
</tr>
<tr>
<td>Coppell</td>
<td>303</td>
<td>425</td>
<td>0</td>
</tr>
<tr>
<td>Carrollton</td>
<td>328</td>
<td>547</td>
<td>31</td>
</tr>
<tr>
<td>Addison</td>
<td>414</td>
<td>297</td>
<td>16</td>
</tr>
<tr>
<td>Dallas</td>
<td>968</td>
<td>1,502</td>
<td>188</td>
</tr>
<tr>
<td>Richardson</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plano</td>
<td>316</td>
<td>319</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2329</td>
<td>3090</td>
<td>235</td>
</tr>
</tbody>
</table>

* Additional mitigation to be considered
Noise Analysis Results: Coppell (With Quiet Zones)

- Increase of 1.3 dB
- Increase of 0.7 dB
- Increase of 0.5 dB

Noise Legend:
- No Impact
- Moderate < 3 dB impact
- Moderate > 3 dB impact
- Severe impact
Noise Analysis Results: Richardson (With Quiet Zones)

Noise Legend
- Green: No Impact
- Yellow: Moderate < 3 dB impact
- Orange: Moderate > 3 dB impact
- Red: Severe impact

- 0.1 dB Increase
- 0.2 dB Increase
- 0.6 dB Increase
- 0.7 dB Increase
- 1.3 dB Increase
- 0.6 dB Increase
- 0.1 dB Increase
Noise Analysis Results: Plano (With Quiet Zones)

1.5 dB Increase

0.3 dB Increase

1.5 dB Increase

Noise Legend
- Green: No Impact
- Yellow: Moderate < 3 dB impact
- Orange: Moderate > 3 dB impact
- Red: Severe impact
Vibration Impacts and Mitigation
Vibration Analysis Status

- Draft Vibration Analysis is complete
- Ongoing review of proposed mitigations
- Vibration Analysis recommendations subject to DART Board approval
Vibration Analysis and Mitigation

MUTICATION FOR VIBRATION IMPACTS IF WARRANTED

Common Vibration Mitigation Measures are Similar to Those for Noise Reduction and Include:

- Stringent transit vehicle and equipment specifications
- Rail vehicle treatments
- Track treatments (e.g. moveable-point frogs, resilient rail fasteners, ballast mats, resiliently-supported ties and floating track slabs)
- Enhanced maintenance
- Restricted vehicle speeds
- Use of deep trenches
- Alignment modifications
- Building vibration isolation (for new construction)

Example of deep vibration trench
Proposed Vibration Mitigation

Track treated with Tire Derived Aggregate (TDA)
Vibration Impact Location Maps
Carrollton and Dallas
Vibration Impact Location Maps
Carrollton

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Vibration Legend
- Vibration Impact
- Vibration Mat

Lakehill Townhomes

Noise Barrier
Vibration Impact Location Maps
Dallas

**Track Legend**
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

**Vibration Legend**
- Black square: Vibration Impact
- Red line: Vibration Mat

**Noise Barrier**
Vibration Impact Location Maps
Dallas

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Vibration Legend
- Orange: Vibration Impact
- Red: Vibration Mat

Noise Barrier
Davenport Rd
Vibration Impact Location Maps
Dallas

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Vibration Legend
- Black square: Vibration Impact
- Red square: Vibration Mat

Noise Barrier

Oakington Ct
Hillcrest Rd
Vibration Impact Location Maps
Dallas

Track Legend
- Red: Eastbound track
- Blue: Westbound track
- Yellow: Freight track
- Green: Special track work

Vibration Legend
- Square: Vibration Impact
- Diamond: Vibration Mat

Noise Barrier
Visual Impacts
Visual Impacts

Impacts on the visual and aesthetic character of an area may occur if:

- Project results in loss of important existing views
- Project conflicts with existing visual elements
- Undesirable views of existing urban features are exposed
- Project is out of character for significant community activities
- Project features do not meet municipal ordinances
Potential Visual Impact Areas

Much of the corridor is commercial/industrial and no visual impacts expected. Potential areas for mitigation include:

• Adjacent residential areas in Coppell, Carrollton, Dallas, Richardson, Plano where no buffer exists or to soften noise walls
• Cotton Belt structure over BNSF in downtown Carrollton
• Addison Wheeler signature bridge
• Knoll Trail Station
• Preston Road Station
• 12<sup>th</sup> Street Station complex
Visual Mitigation Examples

• Landscaping at intervals along residential areas for:
  – Visual screening
  – Soften views of sound walls, corridor fencing
• Preservation of existing vegetation/buffers
• Station landscaping/appropriate lighting in residential areas
• Station materials/finishes to complement surrounding character (e.g. historic Downtown Carrollton)
• Complementary structure design (e.g. Wheeler Bridge)
• Public and agency coordination to define types of vegetation
Visual Mitigation Examples
Appropriate Light Distribution

North Lake Station
Visual Mitigation Concepts
Complementary Design (Wheeler Bridge)

Existing View
Midway looking south to Arapaho

Cotton Belt Bridge without Arch

Cotton Belt Bridge with Arch
Other Impacts
White Rock Creek Bridge Impact

Proposed relocation and reuse of Historic-age Structure
Spring Creek Trail Relocation
CityLine/Bush Alignment

New 12th Street LRT Platform

12th Street Station

CityLine/Bush Station
Spring Creek Trail Impact
Questions and Answers

Request that questions and comments address Impacts & Proposed Mitigation
Corridor Activity

- Site Visits of Corridor:
  - Confirmed: 11/30 & 12/1
- 7:00 a.m. to 5:00 p.m.
- Vehicle and walking with DART staff