Cotton Belt Corridor Regional Rail

Safety and Security Impact Assessment
Technical Memorandum

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1.0 INTRODUCTION

This section identifies potential safety and security impacts that could occur due to transit improvements along the Cotton Belt Corridor from Dallas/Fort worth International Airport (DFW Airport) to Shiloh Road in Plano, Texas. This portion of the Cotton Belt Corridor is known as the Cotton Belt Corridor Regional Rail Project (Cotton Belt Project).

Potential safety issues include station accidents, boarding and alighting accidents, right-of-way accidents, fires, major structural failures, or substantially limiting the delivery of community safety services, such as police, fire, or emergency services. Security impacts include the potential for adverse security conditions, such as incidents and crimes.

2.0 IMPACT ASSESSMENT METHODOLOGY

This section describes the methodology to determine safety and security impacts.

The assessment of safety impacts consist of the following steps listed below.

1) An identification of specific community characteristics:
    - Key locations where pedestrians or bicyclists now cross or use the Cotton Belt Corridor right-of-way or site to reach community services, such as schools, parks, community centers, shopping, or other activity centers. The volume of traffic involved and the characteristics (e.g., age), as well as the times of day is also important to identify
    - Places where people congregate, including parks, schools, community centers, and shopping districts, located near the Cotton Belt Corridor
    - Alleys, streets, bicycle paths, or other formal travel routes adjacent to the Cotton Belt Corridor
    - Traffic volumes on the streets that would be crossed at-grade
    - The accident histories of similar passenger rail systems in Dallas and in other cities, including auto/pedestrian, transit vehicle/pedestrian, auto/auto, and auto/transit vehicle accidents
2) An identification of the planned system operating characteristics such as transit vehicle frequency by time of day and transit vehicle speed.
3) An evaluation based on system design and operating characteristics, of the potential for changes in pedestrian travel patterns resulting from transit project development. Pedestrian elements that would encourage pedestrians to cross the Cotton Belt Corridor at controlled crossings will also be identified.
4) An evaluation of crossing control requirements, the need for other safety-related design features, and needed operation plan changes to be determined based on the previous identification and evaluation steps, government regulatory requirements, and industry practice in similar situations.

The assessment of security impacts consist of the following steps listed below.

1) Potential threats to security at stations, in parking lots, for equipment, within the transit vehicle, and along the Cotton Belt Corridor will be identified.
2) Proposed system operating characteristics that could influence security requirements would be identified, including hours of operation, system access policy, fare collection system, and train frequency.
3) The level and characteristics of community activity adjacent to stations, other structures, equipment, and the Cotton Belt Corridor would be identified.
4) Operating policy, equipment, materials, and design alternatives that address potential threats which are applied system-wide, as well as in unique situations.

3.0 IMPACT ASSESSMENT

The construction and operation of the Cotton Belt Project could lead to an increase in multi-modal traffic and the potential for conflicts with automobiles and pedestrians on area roadways. The following safety and security issues center around avoiding accidents between competing travel modes and ensuring the daily safety of transit patrons at and near station areas. The impacts on safety and security for the proposed Cotton Belt Project are described below.

3.1 Long-Term Effects

This section describes the long-term safety and security impacts of the proposed project. Short-term construction impacts of the proposed project are described in **Section 3.2**.

3.1.1 Base Alternative

The Cotton Belt Project would not be expected to cause any impact to demand for municipal police protection of the community. Additional police protection beyond what is currently provided would be required for project security during both the construction and operation of the proposed project, but DART would provide the needed uniformed and undercover transit police on its vehicles and at station areas. Should it become necessary, DART Police would work with local police to apprehend criminals.

There are three police stations located within the project study area (as defined in the *Safety and Security Existig Conditions Technical Memorandum*), Addison Police headquarters, Dallas North Central Police Station, and Plano Police Department headquarters. There would be no long-term impacts to these police stations with the Base Alternative.

The Base Alternative may require fire protection services for control of fires in the vehicles. However, it is unlikely that a fire would occur in a regional rail vehicle since all vehicles would be constructed of flame- and shatter-resistant materials, would be equipped with fire extinguishers, and would have an exterior constructed with fire-resistant materials. Because the potential for fire is low, it is not anticipated that the Base Alternative would necessitate the hiring of additional fire protection personnel.

Four fire stations are located within the study area, Fire Station No. 121 in Coppell (alignment), Fire Station #1 in Carrollton (station), Fire Station #7 in Addison (station), and Fire Station #7 in Dallas (station and alignment). There would be no long-term impacts to these fire stations under the Base Alternative.

The potential exists for increased demands for emergency medical services due to the concentration of passengers at the rail stations. Although there are no major hospitals in the project study area, emergency vehicles could be slightly delayed if they have to cross the alignment at an at-grade crossing during a response to an emergency. However, emergency vehicle response time is not likely to be impacted by the Base Alternative since the gate down-time is expected to be around 30 to 60 seconds.

Pedestrian safety impacts concern safe walking environments to schools, parks, and other key community centers. As active freight rail exists, the addition of frequent rail service along the

Cotton Belt Corridor would not likely present safety and security concerns for adjacent residents and businesses.

There would be a potential impact to vehicular and pedestrian safety at points where the Cotton Belt Corridor cross streets at-grade. Based on assumed operational parameters for the Cotton Belt Project, which are summarized in the *Traffic Impact Analysis Technical Memorandum*, 44 of 50 current at-grade crossings would have no long-term impacts. Four current at-grade crossings would be impacted enough to warrant a grade separation. As a result of the grade separations, pedestrians and vehicles would no longer interact with trains, which would eliminate the potential adverse impact at these locations. Grade-separated rail crossings are recommended at:

- Denton Tap Road
- Midway Road
- Coit Road
- E Plano Parkway and US 75 NB/SB Frontage Roads

Although the addition of proposed rail service increases the potential for impacts in and around station areas, stations would be designed in accordance to DART safety measures such that no negative safety impact to a station area is anticipated. Additionally, the presence of DART Police and other personnel would serve to deter crime at stations.

3.1.2 Cypress Waters Alternatives

This section describes the impacts that would result from the two Cypress Waters alternatives.

Cypress Waters Southwestern Boulevard Alternative

The safety and security impacts would be the same as mentioned in the Base Alternative.

Cypress Waters South Alternative

The safety and security impacts would be the same as mentioned in the Base Alternative.

3.1.3 North Dallas Profile Options

This section describes the impacts that would result from the North Dallas Profile Options.

At-Grade Profile Option (Section 3-2A)

The safety and security impacts would be the same as mentioned in the Base Alternative.

Trench Profile Option (Section 3-2B)

The safety and security impacts would be the same as mentioned in the Base Alternative, except that there would be no at-grade crossings along the Trench Profile Option of the proposed rail alignment. Roadway intersections with the proposed Trench Profile Option would be reconstructed as overpasses.

Tunnel Profile Option (Section 3-2C)

The safety and security impacts would be the same as mentioned in the Base Alternative, except that all at-grade crossings for the proposed rail alignment would be eliminated with the Tunnel Profile Option.

3.1.4 Red Line Interface Alternatives

This section describes the impacts that would result from the two Red Line interface Alternatives.

North Alternative (Section 3-4A)

The safety and security impacts would be the same as mentioned in the Base Alternative.

South Alternative with Aerial Station and Depressed Freight (Section 3-4B)

The safety and security impacts would be the same as mentioned in the Base Alternative, except that Spring Creek Trail would be crossed by the proposed alternative and the East Plano Parkway and US 75 NB/SB Frontage Roads intersection would not be impacted by the proposed alternative.

3.2 Short-Term Construction Effects

During construction of the proposed project, police and fire protection and emergency medical services may be affected. Contractors constructing the new rail alignment would be required to follow all applicable local, state, and federal regulations regarding safety.

4.0 MITIGATION OPTIONS

As the safety and security impacts would be consistent across all the alternatives, the mitigation options offered in this section apply to any alternative selected.

The final design would include a guideway designed in accordance with the *DART Design Criteria Manual*, National Fire Protection Association NFPA-130 (Standard for Fixed Guideway Transit and Passenger Railway Systems), and the applicable fire and building codes. Ventilation, fire suppression, lighting, and other Life Safety provisions would be incorporated in accordance with NFPA-130.

4.1 Long-term Impact Mitigation Options

Examples of best practices, industry standard safety features, and potential mitigation strategies for safety and security concerns are listed below.

4.1.1 Safety

Crossings

- Provide crossing controls at all crossings. The selection of the type of controls takes into account whether a shared right-of-way or exclusive right-of-way is planned; whether a street right-of-way is to be used; the number of pedestrians and automobiles crossing the planned passenger rail line and their characteristics; sight distance; train speed; and train frequency. Protection can include standard railroad control devices and/or traffic signals. If a quiet zone is implemented at a crossing, additional design components must be included, such as raised medians or quad gates.
- Provide warning signage at rail crossing approaches to alert drivers and pedestrians of rail crossing; audible warnings may be implemented as warranted.
- Provide underpasses or overpasses for pedestrians at high volume pedestrian locations.
- Use fencing at locations where train operation speed exceeds 45 mile per hour (mph) if a high likelihood exists for frequent crossing of the passenger rail ROW between designated crossings.
- Close streets that do not have a demonstrated need for an at-grade crossing.
- Use zigzag fencing (Z-crossing) at exclusive pedestrian/bicycle crossings to force cyclists to slow and pedestrians to look.

Vehicles

- Purchase transit vehicles with good operator visibility.
- Use automatic train protection to prevent trains from entering a “block” already occupied by another train.
- Incorporate a “dead man’s” feature that will automatically stop the train if the operator releases the power control because of inattention or health problems.

- Use flame and shatter resistant materials, such as materials with no or low toxicity levels when exposed to heat or flame.
- Provide a two-way emergency communication system between the train operator and passengers.
- Provide police protection on the vehicles.
- Vehicles that will be operated on track that is on or connected to the national network will have on board PTC equipment as well as wayside equipment.

Stations

- Incorporate design elements that maximize safety to prevent criminal activity in the parking areas and within the transit stations themselves; utilize Crime Prevention through Environmental Design (CPTED) principles.
- Provide adequate lighting to deter crime and assure good vision in the station and parking areas.
- Maintain good sight lines through the station to reduce concealment areas for criminals.
- Separate the circulation patterns of various transportation modes so that the interaction between pedestrian traffic and automobiles or transit vehicles is minimized.
- Provide crossing controls at warranted pedestrian and bicycle crossings.
- Provide frequent random security patrols of the stations and trains.

Subsystems and Equipment

- Use a “fail safe” philosophy for designs so operation can be safe even after experiencing a failure; use redundant components where this is not possible.
- Isolate hazards so the effect of any hazardous event is contained as close to the source as possible.
- Provide means for verifying safe performance and operation, as well as interlocks, whenever out of sequence operation could cause a critical hazard.

Emergencies

- Conduct information sessions with local police and fire departments regarding safety and security issues, as well as agency responsibilities.
- Provide emergency walkways along aerial and subway segments to permit safe, rapid evacuation of trains and guideways between stations.
- Prepare an emergency plan with municipal police and fire departments, emergency medical services, and other appropriate civil agencies.
- Provide Emergency Vehicle Preemption Equipment (EVPE) and other similar technologies, where appropriate, to ensure priority status for emergency vehicles. EVPE sensors detect rapidly flashing emergency signals to allow preemption, giving priority to traffic in the direction from which the emergency vehicle is approaching.

- Locate alternate routing for emergency vehicles operating out of facilities near at-grade crossings, taking into consideration whether the alternate route will create longer response time than the crossing gate down time.

4.1.2 Security

Best practices and mitigation techniques rely on the principles of CPTED to deter vandalism and ensure security for patrons. Some of these elements include:

Facilities Design

- Design station layouts and landscaping plans that minimize nooks, corners, and other low-visibility spaces that could be used as a hiding place.
- Provide right-of-way fencing in areas with high rates of vandalism.
- Design and light parking lots for high visibility from other locations in station areas.
- Provide visibility of public areas from control facilities and offices.
- Select materials that are difficult to vandalize and easy to clean.
- Incorporate door/gate systems for aerial station entrances, and entrances that lead to non-transit authority facilities.
- Obstruct potential offenders by using locks, reinforced materials, or other physical barriers.
- Landscaping near common walkways should not be in excess of three feet in height.
- Designate off-hours waiting areas in locations that are under surveillance.

Security Systems

- Incorporate a public address system into stations and vehicles.
- Provide radio communications between staff and control centers.
- Provide telephones and police emergency call units at stations.
- Use intrusion detection alarm systems.
- Use vandal resistant fare collection equipment and money handling via locked coin and bill containers.
- Use key-lock system that resists duplication.
- Install CCTV surveillance systems on transit vehicles and at ticket vending machines.
- Provide “Blue Light” Police Phones or Public Pay Phones for emergency communication purposes.
- Implement random checks by security personnel to ensure that patrons have paid the correct fare.
- As of March 2012, DART completed installation of closed circuit cameras at all light rail stations; a pilot program for video surveillance on trains was implemented in 2012.

Vehicle Design

- Use materials that are resistant to vandalism and graffiti and that are easy to clean.
- Use windows that provide between-car visibility.
- Provide a system for direct communication between the patron and the train operator.

4.2 Short-term Construction Mitigation Options

During construction of the Cotton Belt Project occurs police and fire protection and emergency medical services may be affected. Contractors constructing the Cotton Belt Project would be required to follow all applicable local, state, and federal rules regarding safety. Contractors

would also notify police, fire, and emergency services in advance of any potential construction impacts that would reduce service to the public.

Other mitigation options include:

- Light adjacent sidewalks
- Employ flaggers where trucks enter and exit the construction site
- Fence all construction sites
- Cover truck loads so materials do not spill onto the roads
- Regularly sweep streets next to the construction site to keep the roads free from debris

Alliance Transportation Group
Arredondo, Zepeda & Brunz
Bowman Engineering
Connetics Transportation Group
Cox|McLain Environmental Consulting
CP&Y
Criado & Associates
Dunbar Transportation Consulting
HMMH
KAI Texas
K Strategies Group
Legacy Resource Group
Mas-Tek Engineering & Associates
Nathan D. Maier Consulting Engineers
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