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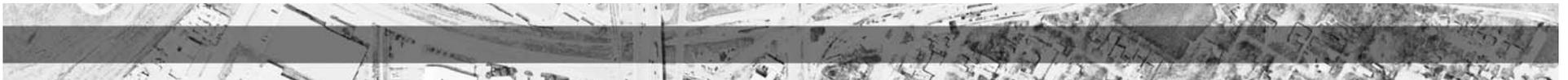
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Abbreviations:

AAR	Association of American Railroads
CRT	Commuter Rail Transit
DART	Dallas Area Rapid Transit
DCTA	Denton County Transportation Authority
DFW	Dallas / Fort Worth
DGNO	Dallas Garland Northeastern Railroad
BNSF	Burling Northern / Santa Fe Railroad
FEIS	Federal Environmental Impact Statement
FTA	Federal Transit Administration
LRT	Light Rail Transit
NCTCOG	North Central Texas Council of Governments
SHPO	State Historic Preservation Officer
TIRZ	Tax Increment Reinvestment Zone
TRE	Trinity Railway Express



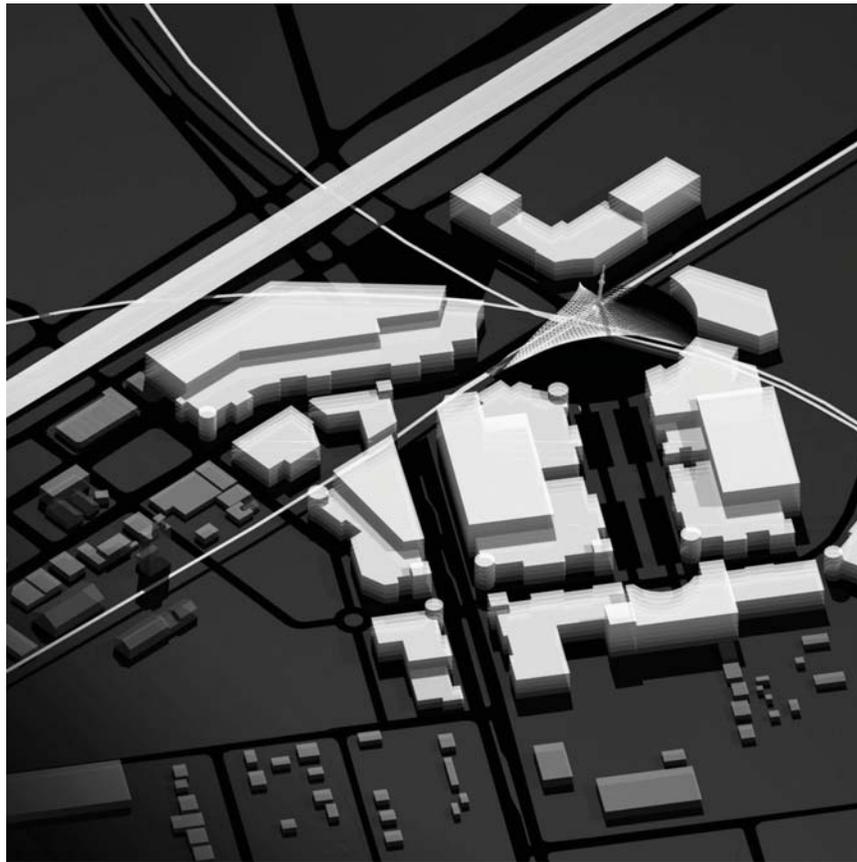


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1. Introduction

The Downtown Carrollton Rail Station Master Plan is intended to achieve an integrated vision for a transit centered community built around a key transit hub for the metroplex. The future Downtown Rail Station complex will improve local and regional access, and strengthen linkages between transportation, land use and economic development. The project is also an opportunity for Carrollton to develop a true urban center serving as the symbolic center of the city. The master plan will provide a development framework within the constraints and opportunities of passenger and freight operations to achieve this vision. The master plan will also address parking and access, infrastructure needs, public-private financing, and transit funding strategies as the project progresses.

Located at the juncture of the Union Pacific, commonly known as the “Katy”, Cotton Belt, Burlington Northern/Santa Fe (BNSF) and Dallas Area Rapid Transit (DART) rail lines north of Belt Line Road, the project will connect DART and the proposed Denton County Transportation Authority (DCTA) system, with future connections to DFW Airport, Plano and Frisco via the Cotton Belt and BNSF lines.

The DART Northwest Corridor FEIS (October 2003) established the purpose and need for the DART Downtown Carrollton Station.

DART is currently in final design of the Light Rail Transit (LRT) station with revenue service planned for 2010. The *DART 2030 Draft System Plan* also includes provisions for a station on the Cotton Belt Corridor with service planned for the 2020 -2030 time frame

connecting Plano with the DFW airport. In May of 2005, The Denton County Transportation Authority (DCTA) adopted a “locally preferred alternative” that includes a station at downtown Carrollton and extends rail service north to Denton.

In addition, the North Central Texas Council of Governments (NCTCOG) completed a *North Texas Regional Rail Corridor Study* in December 2005 establishing the need for a regional rail station on the Burlington Northern / Santa Fe Line (BNSF) at the Carrollton junction. This line will connect Frisco with Irving and DFW. The juncture of four rail lines in downtown Carrollton will transform Carrollton into a primary destination and transfer point within the Metroplex.

The Master Plan is being developed in two phases. The initial

phase, covered in this report, focuses on early development of key issues affecting other passenger and freight operators, essentially setting the constraints or framework for the project. The second phase will include conceptual project development (Preliminary Engineering) of the transportation component (alignment, track work and station), and development of a Master Plan for new development and infrastructure related to the station. The project area of the master plan is bounded by Belt Line Road to the south, Interstate 35 (IH-35) to the west, Hutton Branch to the north, and Jackson Road to the east. All development outside of the immediate station area will be coordinated with the Downtown Carrollton Station component of the *Carrollton Renaissance Initiative* update being developed under a separate contract by Townscape Inc.



Figure 1.0: Study Area

Project Vision

- Creation of Regional Transit Connections
- Integration of Transportation Modes
- Development of an Urban Community
- Gateway and Symbolic Center of the City
- Catalyst for Revitalization

2. Goals and Objectives

The primary goal of the project is to initiate the design of a new multimodal station complex for downtown Carrollton integrating multimodal, multi-agency transit service with a new urban center and gateway to the City of Carrollton. The station complex will include passenger rail operations for the DART Northwest Corridor, DCTA, DART Cotton Belt (Crosstown) Line, and potentially the Burlington Northern/Santa Fe (BNSF) line. The station complex will provide connections between passenger platforms, provide passenger amenities, a place for public interaction, and integrate transit-related mixed-use development.

Project Analysis Conditions

The project analysis conditions listed below were developed from preliminary discussions between the design team and City of Carrollton staff. These assumptions

reflect the project parameters and establish the basis of the project scope. These conditions will continue to be validated and modified as the project progresses.

1. The project is divided into two phases. The initial phase focuses on early development of key issues affecting other passenger and freight project stakeholders. The second phase includes project development of the transportation component (rail station) consistent with a 20% level of project completion (Preliminary Engineering), and development of a Master Plan for new development and infrastructure related to the station within an area bounded by Belt Line Road to the south, IH-35 to the west, Hutton Branch to the north, and Jackson to the east.

2. The project will be coordinated with the parallel *Transportation and Parking Study* sponsored by the City and under contract to Jacobs Civil Inc. The study will include traffic volume projections, area parking requirements/facilities, and traffic network mitigation measures.

3. Primary project stakeholders include DART, DCTA, Burlington Northern/Santa Fe Railroad (BNSF), and Dallas, Garland & Northeastern (DGNO) railroads. Secondary stakeholders may include intercity bus operators, shuttle services, and taxi cab operators.

4. The success of the project requires coordination with the BNSF, and DGNO railroads to assess impacts of freight movements, determination of passenger rail operating rights and priorities, and

the eventual relocation of Mercer Yard, the existing railroad yard in the Downtown Carrollton Station area. This is a significant goal as the character of the yard is inconsistent with future transit supported development.

5. Other stakeholders include property owners, downtown businesses, developers, and special interest groups as identified by the design team and the City of Carrollton.

6. The project includes coordinated Steering Committee meetings with the goal of building community support for the project and acceptance of the design concept.

7. The Master Plan portion of the project will be coordinated with the *Carrollton Renaissance Initiative* and ongoing refinements to that plan.

8. Accommodation of on-site parking, passenger drop-off, bus circulation, and hike & bike trail connections as defined in the *Trails Master Plan* adopted by Resolution 2986 will be required.

9. The rail station complex definition will include determination of enclosed space, vertical and horizontal circulation, climate control, passenger amenities, public plazas, integration of public facilities, and transit-related retail. In short, the “people” facilities necessary to accommodate host passenger flows from 3-4 separate rail services.

10. The concept for mixed-use development will be based on the updated *Renaissance Initiative* and market analysis under separate contract with Leland Consulting Group sponsored by the City. Development density and phasing will be verified by the Carter & Burgess Team.

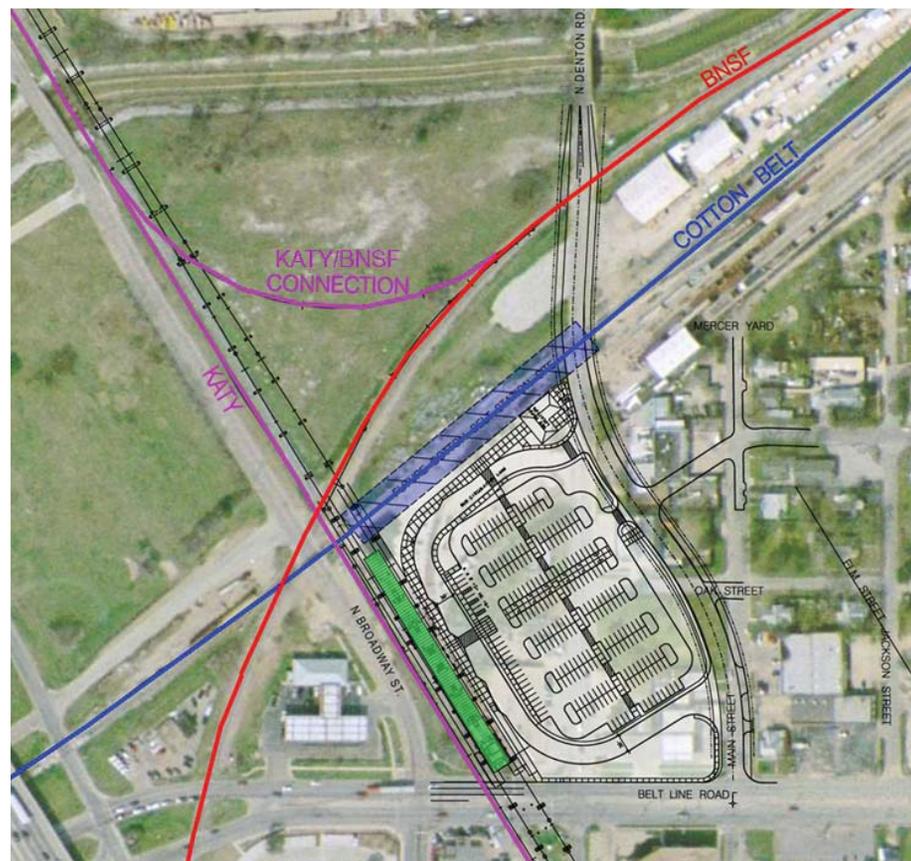


Figure 2.0: DART NW LRT Station Plan

Project Objectives

per page 2

- Develop a station layout for the ultimate configuration and operations based on the project goals.
- Develop a mutually supportive freight and passenger operation plan that improves freight service and enhances passenger operations.
- Develop a phased implementation plan assuming that the current DART LRT platform will be phase one.
- Define the relationship between private development and the ultimate station layout and phasing.
- Define the parking requirements for the ultimate rail station configuration and proposed development.
- Define the theme and architectural character of the surrounding development.

2. Stakeholder Goals and Objectives

In addition to the overall project goals, individual stakeholder goals have emerged over the course of the project. The goals may be complimentary or contradictory but are recognized as a primary factor in achieving consensus for the project. As the project develops goals may be refined or changed based on changing views of each stakeholder. The goals for each stakeholder at this point of the project are summarized as follows.

City of Carrollton

- Guide decisions for integrated station development
- Accommodate all transportation providers
- Maximize benefits to development and transit
- Promote land use/transportation interaction
- Establish viable mixture of land uses, employment, and housing types
- Provide convenient, unobtrusive parking
- Coordinate diverse input from all interested parties
- Relocate Mercer Yard to an area compatible with land uses

DART

- Provide scheduled revenue service to Carrollton by 2010 utilizing the proposed station type
- Facilitate timely modifications to Katy and Cotton Belt Corridors to allow for use of Katy ROW
- Accommodate future land use and development without compromising access, parking, and station construction
- Facilitate approvals by the State Historic Preservation Officer (SHPO) for relocation and rehabilitation of historic Cotton Belt Depot
- Maximize ridership and promote cost effectiveness

DCTA

- Improve transportation for Denton County and the region
- Provide DCTA regional rail service connecting to the DART LRT system in Carrollton
- Promote DCTA system's seamless linkages with other regional transportation systems
- Maximize ridership and cost-effectiveness to enhance opportunities for federal funding

Freight Railroads /Operators

- Maintain rail service to freight rail customers
- Avoid hindrances that would adversely affect cost-effective freight rail operations
- Provide adequate freight rail capacity to satisfy current and future customer demands
- Reduce and eliminate at-grade railroad crossings

Future Development Partners

- Create development opportunities
- Enhance potential property values in station area
- Use TOD to maximize rental rates
- Utilize incentives for joint development and transit oriented development (TOD)
- Minimize risk and maximize return on investment

Community

- Enhance downtown by revitalization and transit-oriented development
- Improve accessibility to local and regional public transit
- Create high quality public facilities and open spaces
- Provide meaningful opportunity for citizen participation
- Make cost-effective use of community resources
- Maximize choices for transportation



DART Downtown Carrollton Station



3. Existing Conditions

Land Use

The study area includes a mix of retail, light industrial, single and multi-family residential uses, and vacant parcels. Much of this area is planned to be redeveloped as part of the *Downtown Carrollton DART Station Area Plan* and *Carrollton Renaissance Initiative*. The redevelopment potential for the surrounding land uses are documented in the *Downtown Carrollton DART Station Area Plan*. The *Station Area Plan* concluded that there are 12 acres of under utilized land in the station area with development or redevelopment potential. See the *Renaissance Initiative* and *Downtown Carrollton Station Area Plan*, adopted by City Council Resolution 2580 for additional information.

Access/Circulation

Future patrons of the planned rail transit service must have convenient access to, and adequate parking at, the Downtown Carrollton Station to ensure maximum use. If unable to access or find a parking space at the station, patrons are less likely to choose rail over other options.

This section looks at the access and parking aspects of the proposed Downtown Carrollton Rail Station. Phase I of this analysis focuses on access and parking for the transit station. Phase II will address access and parking needs for the associated transit oriented development anticipated to occur around the station. Parking requirements and access will be coordinated with the *Transportation and Parking Study* being conducted concurrently under a separate contract to the City. The focus of the parking study

will be the analysis of all elements of the surrounding transportation network.

Scheduled to open in December 2010, the planned DART light rail station is expected to serve a large number of patrons every day, which will increase vehicular, pedestrian, and bicycle traffic in the area. The existing roadway, pedestrian networks, and parking facilities will need improvement to support the anticipated rise in traffic and parking demand.

Roadway Network

Access to transit allows the opportunity to use the service and is a critical factor that can significantly influence transit ridership. A patron's decision about choosing transit over other travel options is generally based on a number of factors including trip duration, cost, number of transfers required, point of origin, trip length to and

from the station, trip purpose, and auto availability.

The existing roadway network in the station area is shown in Figure 3.1. Two major regional thoroughfares provide access to Downtown Carrollton: IH-35 and Belt Line Road. IH-35 is a 6-lane divided freeway with full access control, which is oriented diagonally from the southeast to the northwest and borders the west side of the downtown area. Belt Line Road is a 6-lane divided major arterial roadway that transects the downtown area in an east-west orientation. The grade-separated interchange of IH-35 and Belt Line Road is located on the west side of the downtown area. Continuous frontage roads are 2-lanes with one-way traffic operation. The IH-35 frontage roads and Belt Line Road intersect at grade with the network of downtown local streets. In the core of downtown, located between

3. Existing Conditions

continued

Existing At-grade Railroad-Roadway Crossings

Three railroad lines (“Katy,” Cotton Belt, and Santa Fe) intersect in the station area. Numerous existing at-grade crossings create conflict points that frequently interfere with the flow of traffic in the area. Traffic delays occur when trains block the crossings, resulting in traffic congestion and causing auto drivers to avoid the area when possible. Table 3.1 lists and Figure 3.2 shows the existing railroad-roadway grade crossings in the vicinity.

Highway and rail traffic operations through the area will be significantly improved by eliminating some of the at-grade railroad-roadway crossings. The planned lowering of Belt Line Road will achieve a reduction in the number of grade crossings by six.

Pedestrian Network

Pedestrian facilities provide linkages within the downtown area as well as connectivity with the surrounding neighborhoods. In the core area of downtown Carrollton, south of Belt Line Road (shown in Figure 3.3), the sidewalk network is fairly complete and in good condition. However, with increased pedestrian volumes due to development, additional sidewalk width will be required. Most streets have sidewalks on both sides and the walks are wide, level, and continuous. Crosswalks at intersections are marked with appropriate signage and pavement markings. The sidewalk network in the core area may be able to serve increased pedestrian traffic as a result of the DART station.

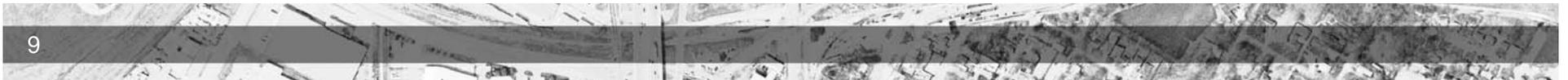
In the portion of downtown north of Belt Line Road, sidewalks are nonexistent or discontinuous with gaps in the network; present in

one block, absent in another. Moreover, the railroad lines intersect some major streets and pedestrian pathways. The absence of an integrated sidewalk network and the presence of railroad lines limit pedestrian mobility in this area. Development of the rail station should include pedestrian improvements to provide a pedestrian-friendly environment.

Parking

In addition to bus and pedestrian access a large number of riders are expected to access the rail transit service by driving to the station. These passengers will require parking spaces for their cars as they ride the train.

When DART begins LRT service in 2010, 262 parking spaces will be provided at the station.



	Union Pacific	Cotton Belt	Burlington Northern
West Belt Line Road	Yes*		Yes*
West Main Street	Yes		
4th Street	Yes		
North Denton Road		Yes	Yes
North Broadway Street		Yes	Yes
Southbound I-35 East Frontage Road		Yes*	Yes
Northbound I-35 East Frontage Road		Yes*	Yes
North Main Street			Yes

* Existing grade crossing will be eliminated by depressing Belt Line

Table 3.1: Existing Railroad - Roadway Grade Crossings

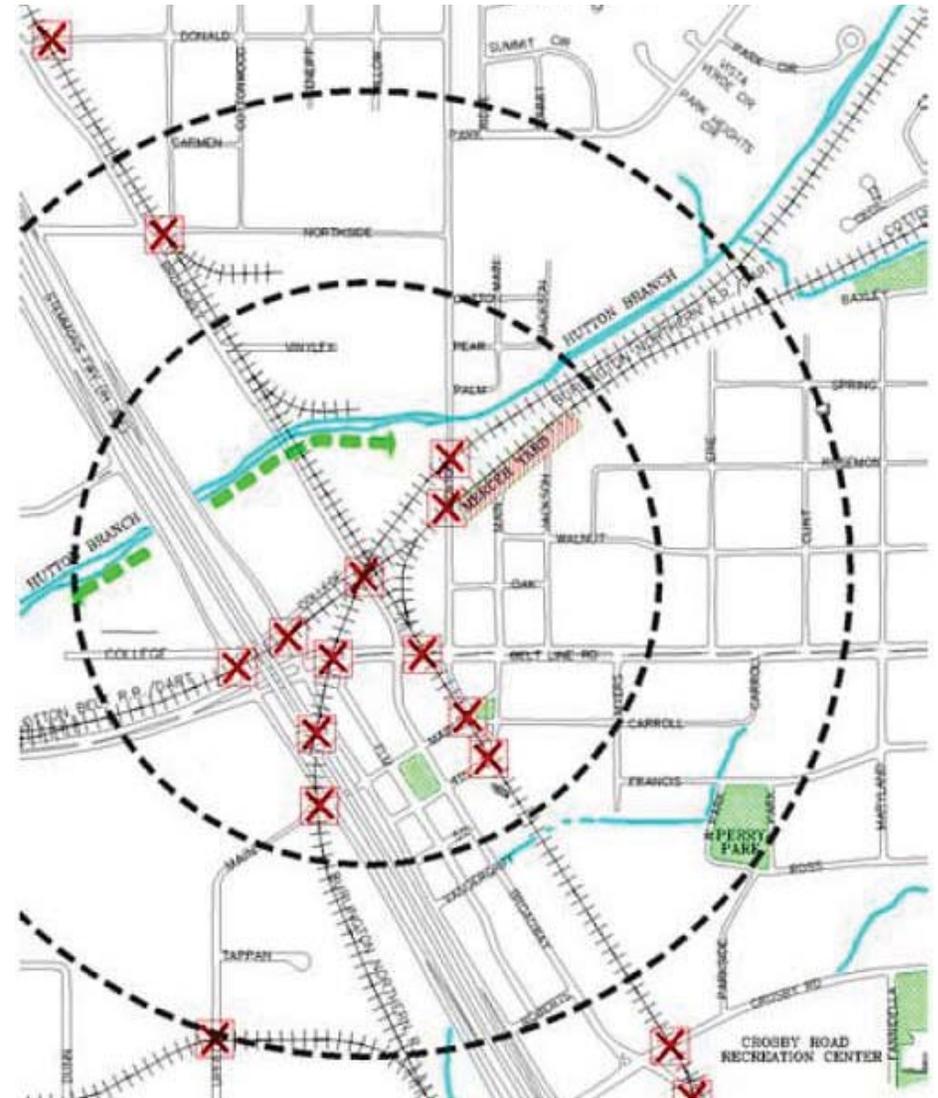


Figure 3.2



3. Existing Conditions

continued

When DCTA begins service, the Downtown Carrollton Station will become an important transfer point. This increase in transfer activity is primarily rail-to-rail and will not result in a significant increase in parking demand. When service is introduced on the Crosstown and BNSF lines, it should further increase transfer activity at the Carrollton Station. As activity increases, the level of automobile traffic and the associated parking demands are not expected to increase dramatically as more passengers shift to other modes for accessing the station.

* Parking needs for future passenger service is addressed in Section 11.

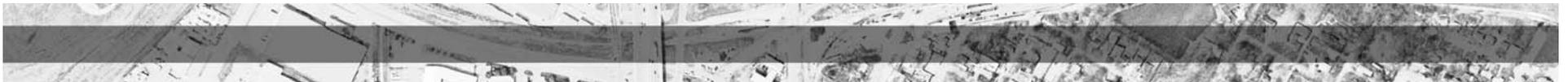
Parking Availability

A limited amount of parking currently exists in the station area. Most of the available parking spaces are in downtown Carrollton. Most of the existing parking consists of on-street parking spaces, primarily intended for short-term use by the shoppers and visitors doing business in the downtown area. A number of off-street surface parking lots associated with individual land uses are present in the downtown area.

The City completed the construction of 71 public parking spaces in May of this year on City-owned property at Carroll Street. The need for additional parking will be addressed in the *Transportation and Parking Study*.



Figure 3.3 Existing Downtown Parking



3. Existing Conditions

continued

Bikeways

The *City of Carrollton Transportation Plan* includes designated pedestrian and bicycle trails. Trails in the downtown station area include a trail running between the BNSF right-of-way and Hutton Branch Creek northeast of the station and a trail paralleling the Katy right-of-way north and south of the station. These trails are indicated as intersecting at the Carrollton Downtown Station. Due to the modifications being made by DART to accommodate the Cotton Belt to Katy freight connection, the trails will not be able to intersect as shown in the *Transportation Plan*. Figure 3.4 represents a solution to the freight track conflict by connecting the proposed Katy Trail to the Hutton Branch Trail north of the junction. Connection of the Hutton Branch Trail to the trail south of the station would utilize the proposed new Main-Denton

Connector. The proposed new street would need to be designed to accommodate the bike path or a dedicated bike lane. Further development of this alternative and others will be addressed in Phase 2 of the study.



Figure 3.4: Proposed Pedestrian/Bike Trail



4. Policy Context

Zoning

In order to encourage new development in the station area, the City of Carrollton adopted a Transit Center Zoning District as part of the Comprehensive Zoning Ordinance. The goal of the district is to provide development and land use flexibility within the framework of a form-based development code, encouraging a mix of residential, retail, and office uses in a pedestrian-friendly district. The intent of the code as presented in the *Carrollton Renaissance Initiative* is to:

- Provide a comfortable and attractive environment for pedestrians
- Construct buildings close to the sidewalk and street
- Construct continuous building frontage along block faces
- Provide shared parking both on-street and in the center of blocks
- Contribute to the definition and use of public parks and plazas

- Design streets and buildings which contribute to creating a safe environment
- Build on the character reflected in the Old Downtown area

Based on recommendations in the *Renaissance Initiative*, the Transit Center Zoning District code was adopted by the City of Carrollton in April 2005. The code provides four distinct sub-districts:

Urban Core – urban high-density area adjacent to the station permitting high density residential, (high-rise apartments, condominiums, and townhomes), retail, office, and entertainment uses built around a high degree of accessibility and availability of infrastructure.

Urban Center - moderate-density residential (high-rise apartments, condominiums, and townhomes), retail, and offices also with a high level of access and infrastructure.

Urban Fringe - lower density urban transition district, primarily residential in character. The district is intended to be transitional to existing single family residential neighborhoods.

Historic Core - mixed-use district intended to be utilized where there is a historic character which is to be preserved or enhanced.

The majority of the study area is located in the Urban Core and Urban Center Districts. As the project progresses, development plans will be developed in accordance with the requirements of each district. Specific district design standards are defined in the *Transit Center District Zoning Ordinance*.

Tax Increment Reinvestment Zone

Tax Increment Reinvestment Zone (TIRZ) districts are viewed as a suitable funding tool to help obtain desirable transit-oriented development. The existing conditions of the Downtown Carrollton Station area meet the state's guidelines for a TIRZ in that the age of the infrastructure, antiquated street and lot layouts, and the lack of parking hinder redevelopment. A TIRZ District is one of several financing tools that can be used to finance infrastructure in support of transit oriented development.

In January 2006, the City established a Tax Increment Reinvestment Zone as allowed by law. The TIRZ includes the *Carrollton Downtown Station Master Plan* project area. The City of Carrollton has committed to participate at a 65% rate - that is, 65% of future

revenue increases in the zone will be used to fund infrastructure improvements within the zone. The City is awaiting a decision by the Dallas County Community College District on their participation. The local public school district has declined to participate.

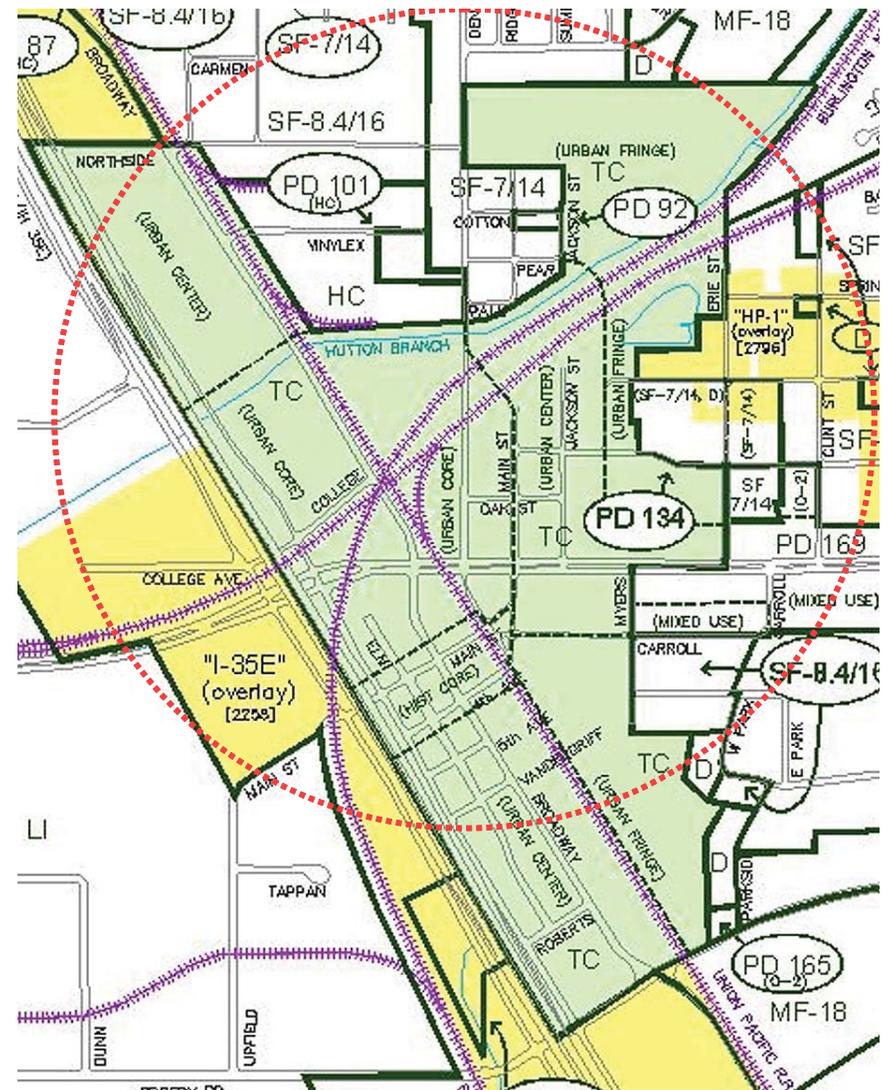


Figure 4.1: Transit Center Zoning



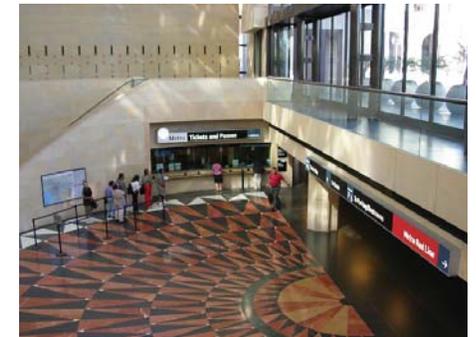
5. Case Studies

Los Angeles Union Station

Union Station - Gateway Plaza is the primary intermodal facility in the Los Angeles Downtown area. The facility provides a link between numerous modes of transportation including regional and local bus lines, commuter rail lines, heavy rail and light rail lines, inter-city rail lines, vanpools, taxis, shuttle services and regional and local freeway systems. The facility is the main transportation hub connecting the suburbs with downtown with 12,000 daily passenger boardings. The station is served by the Metropolitan Transit Authority (MTA) underground Metro Red Line and Gold Line, Amtrak, Metrolink commuter rail, Los Angeles Department of Transportation Dash bus shuttle system, and various bus lines. The proposed California high-speed rail system will also have a stop at Union Station.

The facility design combines historic Mission Revival architecture

with modern additions and includes a large waiting room, concourses connecting transit platforms, a monumental entrance lobby at Gateway Center, exterior garden patios, and a station restaurant. The integral Gateway Center is a mixed-use development that includes a transit plaza and bus terminal, park & ride facility, shops, restaurants, and an office tower, all located on the Union Station property.





5. Case Studies

BART Fruitvale Station

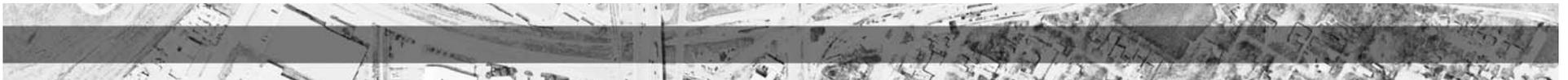
The Bay Area Rapid Transit (BART) Fruitvale Station is located in the Fruitvale District of Oakland. The station consists of two elevated side platforms with a concourse mezzanine at ground level. Passengers are served by the BART rail system and local bus service providing a total of 16,000 daily passenger trips.

BART worked with local redevelopment organizations to develop the BART Fruitvale Station into a \$75 million, 17-acre transit village. The project was initially conceived as a multi-phase revitalization development project of the BART surface parking lot centered around a pedestrian plaza. The goal of the project was to coordinate public transportation and land use planning between a low-income, inner-city community and the local municipality, transforming the commercial and transportation

core of the Fruitvale neighborhood into a vital, convenient and healthy place to live, work, and shop.

The development currently includes 40,000 SF of retail, 115,000 SF of office, and 47 multifamily housing units integrated into a pedestrian-oriented environment. Planned and ongoing projects also include a health care facility, educational facility, senior housing complex, a police substation, and a child care center.





6. Rail Freight and Passenger Operations

The two primary tasks under Phase 1 of the study are to identify and mitigate the impacts of the Downtown Carrollton Station on rail freight operations, and to develop a plan for future passenger operations for the Crosstown, BNSF, and DCTA lines. The latter includes passenger connectivity between future rail passenger lines and the soon-to-be-constructed DART LRT Line. There is also a desire to test the feasibility of relocating the Mercer Freight Yard from its current position adjacent to the station site. All of the discussions in Section 6 assume that the proposed lowering of Belt Line Road as referenced in Section 2 is implemented.

Current Freight Rail Service

DART had the foresight to acquire a number of light-density freight lines in the metropolitan Dallas area from the major freight

carriers. Local freight service is provided by short line and regional carriers. DART now has access to those rights-of-way for public transportation purposes as the need arises. At the same time, the freight service provides a boost to the local economy by preserving employment in the construction, manufacturing, and warehousing sectors. The presence of local freight service also helps to preserve the rights-of-way from development. Consideration of local freight service is important to the Downtown Carrollton Station.

Rail Freight Lines in Carrollton

Three different rail freight lines converge in Carrollton, crossing one another at the site of the proposed Carrollton Station. All three of the lines are now in DART ownership, although one forms part of a through route that is still connected to BNSF, the original owner.

The existing situation is schematically depicted in Figure 6.1.

The busiest of the lines is the BNSF, having its origins on the Trinity Rail Express (TRE) line in South Irving. This line runs north from that point and curves to the northeast as it passes through Carrollton.

The ownership of this line reverts from DART back to BNSF towards the northeastern end of the Carrollton Station site. The line then passes through Frisco, Sherman, and Madill leading to Tulsa, Oklahoma. Besides providing overflow capacity for long distance freight, the segment passing through Carrollton (known as the “Frisco” or Madill Subdivision) is an important source of local freight service.

It is estimated that the line handles ten BNSF trains a day, most of the trains carry construction aggregate

(rock). In addition, the Dallas, Garland and Northeastern (DGNO), an important regional carrier, has trackage rights on the Madill Subdivision (known as the “Madill Sub”) from Sherman to South Irving.

A second rail line passing through Carrollton is the “Cotton Belt,” which originates in Ft. Worth, passes through Carrollton, Addison, and Plano terminating in Wylie, Texas. The segment from Ft. Worth to Carrollton is operated by the Ft. Worth and Western Railroad. From a point just to the west of the Carrollton Station site to the eastern terminus, the line is operated by the DGNO. There is a small freight yard (known as Mercer Yard) just east of the Katy/Cotton Belt intersection. Mercer Yard serves as a hub for the DGNO operations and local service in the northwest part of Dallas County.

Service on the Cotton Belt is provided by DGNO local freight trains originating in Mercer Yard. There is a spur off the Cotton Belt in Addison that once led directly into downtown Dallas, but now terminates north of the LBJ Freeway (IH 635). In this report, this spur is referred to as the Dalnor Spur. There is daily local freight service on the Cotton Belt to Addison and on the Dalnor Spur. Service from Addison to Plano is less frequent; it's provided only when there are enough cars to justify the relatively long distance run. The DGNO also operates construction aggregate trains from Sherman (on the Madill Sub) to Carrollton (where the engine and crew must "run around" the train - or switch ends) and thence to Plano.

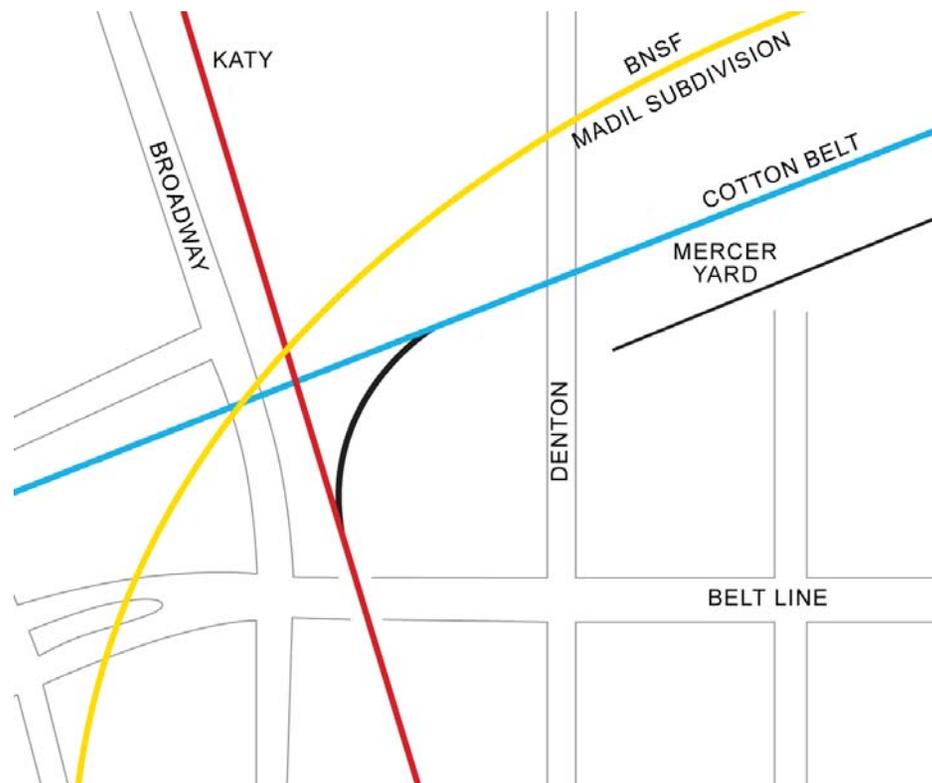


Figure 6.1: Existing Freight Lines

Rail Operations Issues

- Determine feasibility of moving Mercer Yard
- Maintain freight operations
 - Freight train movements
 - Switching and staging
 - Individual industries
- Minimize future conflicts with passenger grade crossings
- Enhance operations if possible

6. Rail Freight and Passenger Operations

continued

A third rail route, referred to in this report as the “Katy,” (previously part of the Union Pacific railroad) originates in downtown Dallas, passes to the south of Love Field Airport and then continues north through Farmers Branch, Carrollton, Lewisville and terminates in Denton. DART ownership of this line ends at the Dallas County line. From that point, the right-of-way is owned by the City of Denton. The track is unused further north in Denton County. Freight service is provided by DGNO to Lewisville. The “Katy” crosses the Cotton Belt and Madill Sub in Carrollton. A connection from the Katy to the Cotton Belt currently exists in the southeast quadrant of the Downtown Carrollton Station area, providing a way for DGNO crews to serve both lines.

Local Rail Freight Service – Current Patterns

The main freight hub for the DGNO operations in Dallas is a yard located on the Trinity Rail Express line between Dallas and Ft. Worth known as Mockingbird Yard. Because of space limitations at Mockingbird Yard, DGNO operates a “hauler” train to Mercer Yard in Carrollton where local freight trains are assembled for final pick-up/delivery of freight to customers on the Katy and Cotton Belt. DGNO typically will operate the “hauler” from Mockingbird to Mercer via the South Irving and the Madill Sub. East of the Carrollton Station site, there is a connection from the Madill Sub to the Cotton Belt. The “hauler” uses this connection to back its train into Mercer Yard. DGNO rock trains also use this connection. The DGNO freight flows are shown schematically in Figure 6-2.

DGNO also has the option of using the Katy to get to Carrollton, but doing so requires the “hauler” to use an industrial track known as the Brookhollow Lead to get from Mockingbird Yard to the Katy near Love Field. Once there, the engine and crew must run the engine around their train to orient it for travel to Carrollton. It then uses the Katy/Cotton Belt connection to gain access to Mercer Yard. The entire Katy route has a 10 MPH speed restriction, making this route relatively undesirable.

Even though DART owns the southern end of the BNSF Madill Sub, they have chosen to leave dispatching in the hands of the majority user, BNSF. With the majority of the freight traffic belonging to them, BNSF may not always give the “hauler” the priority needed by DGNO. To avoid conflicts with TRE’s passenger service from Mockingbird Yard to South Irving,

the “hauler” must operate from Carrollton and back during the night. This, plus the Mercer Yard back-in/back-out movements on the Madill Subdivision at Carrollton and the volume of BNSF trains make the “hauler” operation problematic for DGNO.

With little or no spare room for car storage at Mercer Yard, a failure to get the “hauler” down or back from Mockingbird may result in local customers going without the service they need for a day or more. Exacerbating this situation is the inconsistent service by Union Pacific in making local traffic available to the DGNO at Mockingbird Yard from its yard in Dallas.

If the “hauler” works as intended, the cars it brings to Mercer Yard are sorted on arrival for same-day delivery to customers via local train service. In the evening the

process is reversed. To serve local customers on the Katy, the DGNO uses the Katy/Cotton Belt connection. When the local train goes to Lewisville, it must back around the connecting track. All the aforementioned DGNO activity at Carrollton, plus the BNSF trains operating through mean that blocking of local streets is a common event, a situation which the City of Carrollton has previously identified.

DGNO operates six days a week, Monday through Saturday. Variances in daily volumes on the Lewisville end are such that service may be skipped on some days. There are nine customers between Carrollton and the north end of track in Lewisville, enough to generate an average daily volume of 11 cars.

Business on the Cotton Belt in the project area requires daily

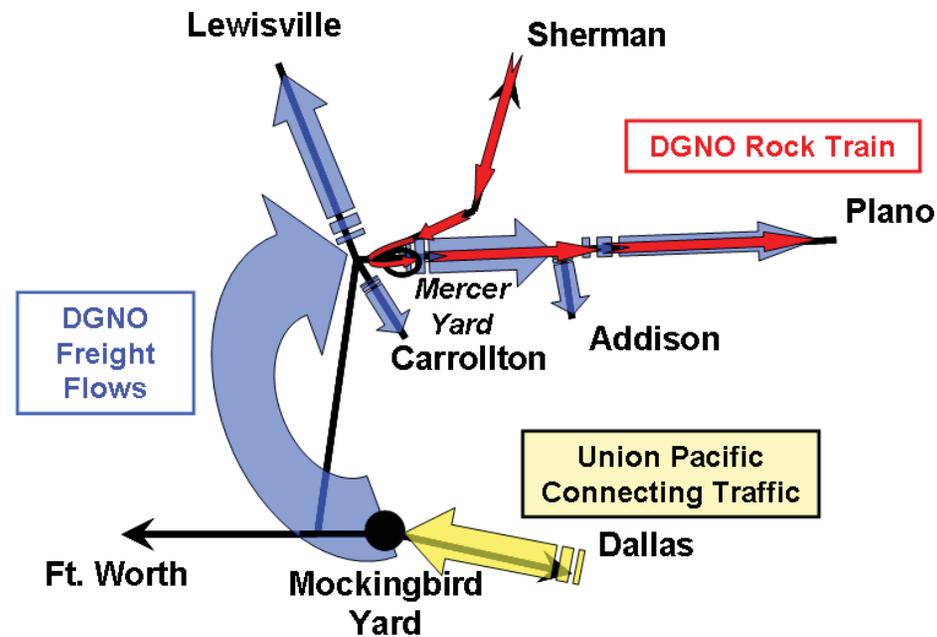


Figure 6.2: DGNO Freight Flows in Northwest Dallas County

Freight Traffic Volumes

DGNO

- Cotton Belt - East:
1 train (31 cars per day)
Plus additional rock trains:
140 round trips per year
- Katy - South:
1 train (5 cars per day)
- Katy - Lewisville:
1 train (18 cars per day)

BNSF

- General freight traffic – Average
2 long freight trains per day
Plus additional rock trains: 8-10
trains per day

6. Rail Freight and Passenger Operations

continued

attention. On days when there is sufficient cargo to justify a trip to Plano, an extra freight run may be required.

There are 13 customers between Carrollton and Addison; six on the Dalnor Spur and four east of Addison, not counting the rock business. The average daily volume is 21 cars, five of which are destined for customers east of Addison.

Regardless of any variations in the local schedule, the DGNO “hauler” between Mockingbird and Mercer yards operates seven days a week. There are days when, due to dispatching and inconsistent deliveries to Mockingbird Yard by the Union Pacific (UP), the “hauler” cannot make the round trip with one crew.

Because DGNO depends on the inconsistent service of UP to get the majority of its interchange

business and because it has limited yard space, cars must sometimes be stored temporarily on-line. DGNO makes use of every available track space when the backlog of cars on-line (in-service) goes above a certain level.

Even when the interchange train traffic is flowing freely, a customer may receive more cars than they have room to unload at once. It may be cheaper for the customer to pay demurrage (rent paid when they are responsible for freight car delays) than to pay work crews overtime to do the unloading. There are also times when freight cars arrive that the customer does not have an immediate need for and instead asks DGNO to hold them. For all these reasons, DGNO is constantly working with an on-line car inventory exceeding the average daily loads and empties thus suggesting storage yards should be expanded.

Managing this on-line inventory and keeping it coordinated with day-to-day operations is a constant challenge. It requires a certain amount of track space for storage and manipulation of the inventory.

Finally, variations in cars on-line can be attributed to seasonal variations in shipments. 2004 loading data shows that the peak month’s activity is in June, when shipments were 11.5% above monthly averages for the year.

Local Freight Service – Impact of DART Extension

DART is currently in final design of a light rail extension from Dallas through Carrollton to Frankford Road. This line will occupy some or all of the right-of-way of the Katy line. Freight service will be discontinued on a segment of the route south of Carrollton. However, DART has included new freight tracks in the existing right-of-way

to serve two Carrollton customers south of the Cotton Belt crossing thereby retaining service to all Carrollton customers. North of Carrollton, all existing customers will be retained. The current DART plan is shown in Figure 6-3.

The Downtown Carrollton Station will occupy right-of-way now containing the curved connection that permits DGNO trains to transfer from the Katy onto the Cotton Belt and back. To provide service continuity to the remaining parts of the Katy, a new connection is planned from Mercer Yard in what is now the northeast quadrant of the freight network. This connection will require trains coming out of Mercer Yard to cross the Madill Sub to get to the new connection. The existing connection near the Cotton Belt Depot also requires trains bound for Lewisville to cross the Madill Subdivision once they have backed out of Mercer Yard.

While this change should not degrade freight service it will require a rearrangement of tracks that needs to take into account long-term passenger and freight service plans.

The changes brought on by the new DART extension will not impact DGNO's operating windows, and with the new connection providing service continuity, the overall local operation will not change significantly. What may prove to be a challenge is the elimination of DGNO's alternate path for the "hauler" from Mockingbird Yard to Mercer Yard. If dispatching priorities continue to be a problem, then DART and DGNO will have to reconsider the assignment of those duties.

As a frame of reference, once the DART LRT project is completed, the estimated daily DGNO car load traffic volumes (based on 2004

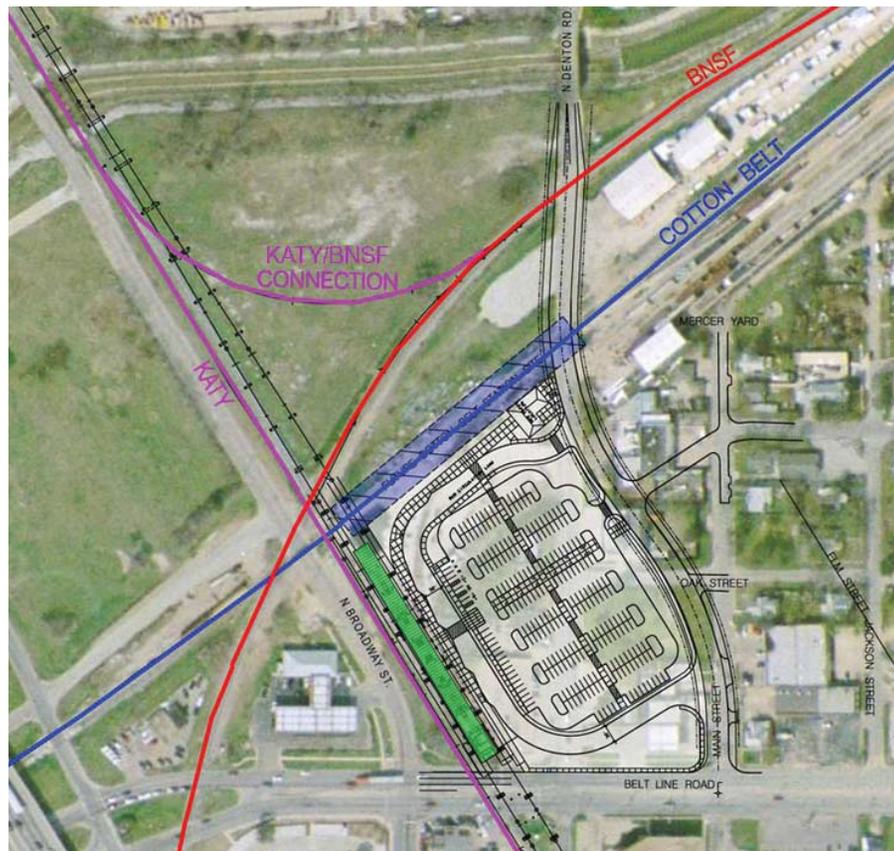


Figure 6.3: Current DART Plan

Current Freight Operators

- DGNO – Dallas, Garland & Northeastern RR
 - Exclusive operator of Mercer Yard
 - Katy Line (to Lewisville)
 - Cotton Belt East of I-35E (to Addison and Plano)
 - Rock trains Sherman-Carrollton (via BNSF)-Plano
- BNSF Railway
 - Through trains to Oklahoma
 - Dallas/Ft. Worth Rock trains
- FWWR – Fort Worth & Western Railroad
 - Cotton Belt West of I-35E (to Fort Worth)

6. Rail Freight and Passenger Operations

continued

traffic levels) would be as shown in Table 6.1. These estimates include allowances for both loaded and empty cars, but do not account for cars being handled or moved for other reasons, such as storage. There is also no provision for growth.

There does not appear to be a need to change any of the regular crew assignments as a result of the DART project. The existing DART plan to relocate the connection between the Cotton Belt and Katy can be implemented and all customers can continue with service in Carrollton and the immediate area. However when additional passenger services are added, the connection to the two customers south of downtown Carrollton on the Katy becomes problematic.

Rail Freight Trends

In Figure 6.4, Rail Freight Trends – Year 2000 Baseline, the pattern for rail traffic growth that roughly corresponds to the time period since deregulation of the railroads, is depicted. The impact of the post-9/11 recession can be seen in the trend since 2000. When overall trends since 1990 are viewed, the underlying growth trend is stronger than the one from 2000-2004. The AAR (Association of American Railroads) publishes this data. 2005 data is not yet available. For a 15-year period, traffic is up between 30 and 55%, depending on the level of service provided. If the weekly AAR statistics for 2005 and 2006 are reviewed, the trends are similar. See Figure 6.4.

It must be emphasized that this is national data. One of the strongest areas of commodity growth after freight to truck transfers

Average Daily Carload Volumes, DGNO Local Lines

Katy south of Multi-Modal Terminal	5
Katy north of Multi-Modal Terminal	17
Cotton Belt	32 Does not include rock trains
Total	54 cars

Considering daily fluctuations, the volumes shown above can easily vary one way or the other by 50%

Table 6.1

(intermodal), is construction aggregate (rock) in the sun-belt states. That type of traffic is currently passing through Carrollton. Nationally that commodity, measured by car-loads, is up 5.8%, year-on-year. It was up 7.8% in 2005 over 2004.

Growth in rail traffic can be absorbed by using heavier cars, having longer trains, or having more trains. Some of the growth is due to longer hauls. The first

preference of the carriers is to take advantage of existing trains to handle business increases and that would be true with the DGNO. In the long run, if business continues to increase, the number of trains eventually increases as well.

What will happen to traffic on the DGNO is hard to predict. It will be tied to the local businesses being served as opposed to following national trends.

Freight Rail Activity

Nationwide Trends - Year 2000 Baseline

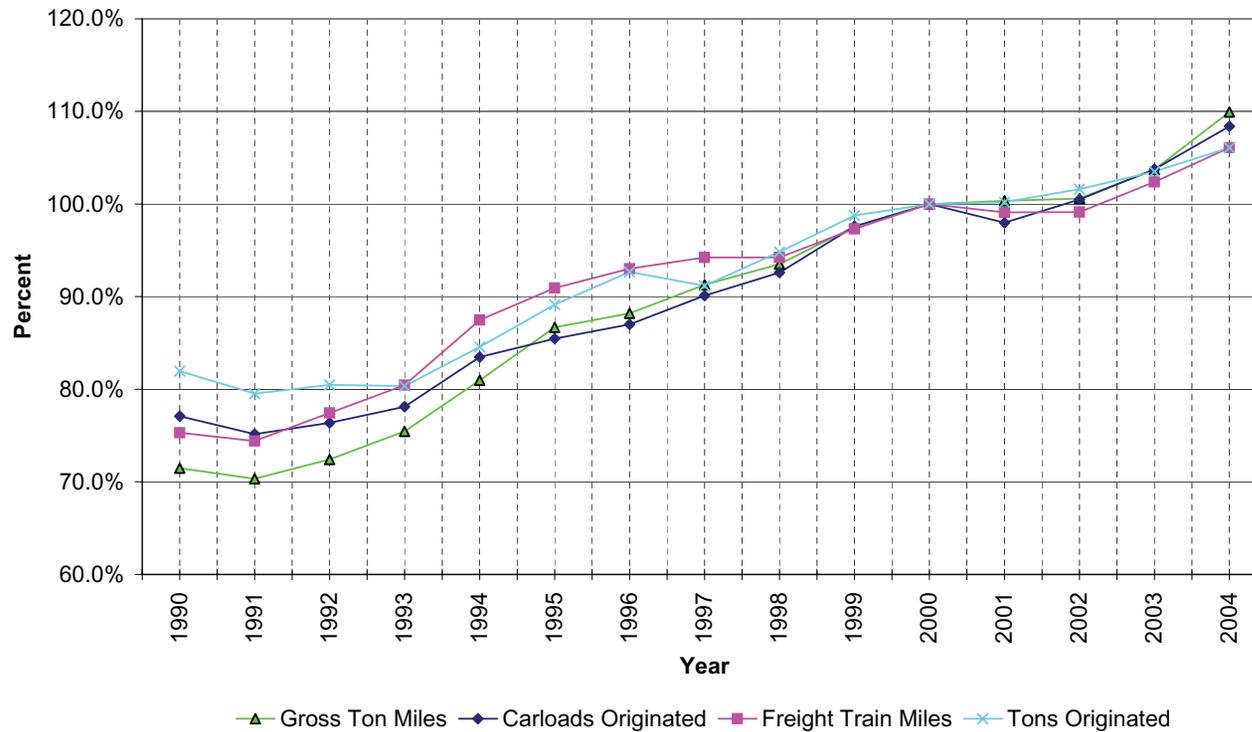


Figure 6.4: Weekly AAR statistics 2005 and 2006

General Freight Operations Trends

- National freight rail growth 1995-2004 (Annual)
 - Coal, 1.7%
 - Intermodal, 5.7%, now over 6%
 - Other carloads, 1.8%
- Carrollton freight traffic
 - DGNO: Local traffic
 - Follow national trends, generally
 - Follow local business, specifically
 - BNSF: Secondary route, now
 - Texas – Upper Midwest route
 - Potential high growth due to route diversions

6. Rail Freight and Passenger Operations

continued

In general, the car load business, as opposed to the train-loads (coal and rock, for example) has been growing very slowly. Railroads have been weeding out less profitable traffic and some traffic has been moved from rail cars to intermodal trailers and containers. If the recent trend of fuel price escalation is sustained, the growth of rail traffic could be accelerated, including car load freight. Lines shed from the large carriers to regional companies, like DGNO, were generally thought to be in decline or at least have less potential than lines retained. However, improved service by the regional carriers has in many cases, stopped or reversed those negative trends.

A second factor that will impact freight traffic in the area of the Downtown Carrollton Station is the potential for more through traffic to be added by the BNSF to the Madill Subdivision. This could

happen if the parallel through-route from Ft. Worth to Oklahoma City becomes saturated with trains. Up to a point, BNSF likely try and find alternate routes for some traffic on under-utilized routes, rather than go to the expense of building more capacity on its core system.

The potential for freight growth should be of enough concern to make preparations for easing its impact a priority. Fortunately, the currently planned lowering of Belt Line Road and its connectors will increase freight capacity by creating grade separated crossings. Through elimination of the roadway/rail at-grade crossings it should be possible to raise the speed on the freight track from 10 to 30 MPH, which will greatly cut the time impacts of freight trains at today's freight traffic level. By the year 2030, it is likely that average freight train length will reach or exceed 7,000 feet. Such

a train moving at 10 MPH will take eight minutes to pass a given point, whereas at 30 MPH, it will take just over two and one-half minutes.

Even though freight traffic may detract somewhat from the design flexibility of the Carrollton Station, it is essential to provide as high a level of service as possible to clear freight trains from the area expeditiously. Relocating the BNSF freight route away from downtown Carrollton, while physically possible, would probably cost hundreds of millions of dollars.

Plan for Freight Rail Service

To complete a plan for local freight service, the addition of more passenger service at the Carrollton Station and the potential relocation of Mercer Yard must be taken into consideration. The former will help frame the needs for right-of way, areas available for development, and how passenger flows are to be accommodated, in addition to local freight service. The latter is a goal of the City of Carrollton that will substantially improve possibilities for development and enhance passenger rail ridership. At the same time, through freight operations and its impact on the station cannot be ignored.

Proposed New Passenger Services

The study team was tasked to ensure that local freight service can be operated as the Carrollton Station adds additional passenger services. The most immediate addition is likely to be DCTA service between Denton and Carrollton. This 21-mile line is in the late stages of conceptual design. DCTA service would be provided on the former Katy Line, sharing it with local freight. It is unclear whether the line would initially come all the way to downtown Carrollton, or stop at the DART Trinity Mills Station to the north. In any case, as services are added on other routes passing through Carrollton, there will be increasing benefits to DCTA transfers at the Downtown Carrollton Station.

The second and third additions, would be the BNSF (according to *NCTCOG Regional Transportation Plan Mobility 2030*) and Crosstown

service (according the *DART 2030 System Plan*). While the timing is somewhat speculative, Crosstown would likely be first as part of the DART 2030 service plan.

The Crosstown would use the Cotton Belt from Richardson and Plano, though Carrollton, to Dallas/Ft. Worth International Airport. The BNSF service would use the Madill Sub from Frisco, through Carrollton to South Irving. From there, trains can connect to the Trinity Rail Express (TRE) to either Dallas or Ft. Worth.

At this point, the responsible agencies have not determined what vehicle equipment technology would be used on the latter two systems, but it is likely that the BNSF service would be Federal Railroad Administration (FRA) compliant due to the volume of freight on the line.

Freight Service Goals

- Make sure the needs of the freight operation were identified
- Minimize future conflicts with passenger
- Minimize community impacts, especially at highway/rail crossings
- Maintain freight service quality, enhancing it if possible

6. Rail Freight and Passenger Operations

continued

Impacts of Passenger Services on Freight

To complete a proposed plan for local freight service, it was necessary to consider both the immediate needs and what would be required if one or more of these additional passenger services come to fruition. The iterative steps taken to see if all needs can be accommodated will be described in a later section.

The conclusions reached in examining the impact of added passenger services are as follows:

- The addition of DCTA service, should it be extended to Carrollton, will not substantially impact freight service by itself. The current DART plan calls for a new connection to be built for local freight service to access the northern section of the Katy line. That connection, as previously noted, is in the northeast quadrant

of the current rail line junction at Carrollton. As long as the DCTA track design does not functionally alter the currently proposed arrangement, DGNO will have full access to its customers, including the ones south of downtown Carrollton. Whether DGNO has access to daytime service on the line is a function of DCTA scheduling and rolling stock choices. As a side note, DCTA would likely also have access to the Madill Subdivision if it wants to run trains to South Irving and beyond. A connection could be made to the Crosstown line for through service to D/FW International Airport as well, although there may be impacts on development from using right-of-way to do this. The DART NW LRT project will provide a modified track arrangement that will continue to permit DGNO's rock train to operate through the station area. Construction of a DCTA platform need not interfere with this move.

- With the addition of a second passenger service to the Downtown Carrollton Station, the freight picture begins to change, no matter whether the BNSF (Frisco) or Crosstown service comes next. First and foremost, the more passenger service that is added, the more untenable it becomes for Mercer Yard to function efficiently. Studies performed for the relocation indicate that it is already of marginal size and utility without any additional operating stress being placed upon it. Second, maintaining the freight connection to the south of downtown Carrollton also gets increasingly untenable. The number of tracks which must be crossed goes up substantially. The investment and associated operating costs of the special trackwork required to preserve service south of downtown Carrollton are going to be high. In addition, it seems that maintaining capability for the rock train to run the engine

around its train will require a separate, dedicated track.

- Once the Frisco and Crosstown lines are completed, it is extremely likely that freight rail serving the large customer south of Belt Line Road will be considered for removal to facilitate passenger service. This may coincide with the end of the useful life of the customer's facility. Given the long time horizons for the development of such service, there should be ample time to arrive at alternative service arrangements if necessary.

The volume of passenger carrying trains almost certainly will require the movement of Mercer Yard and a separate facility for the engines on DGNO's rock train to run around its cars. The freight connection to the Katy line can still be maintained with relative ease.



7. Mercer Yard

Multi-modal stations bring with them the opportunity for transit-supportive development. This benefits the local community as well as providing the potential for increased ridership. Mercer Yard, sitting as it does in the heart of the property surrounding the Downtown Carrollton Station, presents a significant inconsistency and impediment to such potential land use development. When the DART LRT project is completed, freight rail activities associated with the yard will be in conflict with the changes in the local area. As a practical matter, people attempting to park at the Carrollton Station will find interference from freight trains blocking the roadway/rail crossings. Noise and fumes from the yard operations may also have a negative impact on future development, as it does currently. See Figure 7.1, for an overview of the facility.

Realizing this fundamental incompatibility, the City of Carrollton requested the study team examine the potential for moving the yard function elsewhere. The first step in evaluating the feasibility of the relocation was gaining an understanding of the freight operations as previously discussed in Section 6.

Mercer Yard Function

Mercer Yard provides DGNO with the following facilities and capabilities:

- Room for traffic delivered by the “hauler” to be switched to local trains in the morning after it arrives. The operation reverses itself in the evening
- A very modest amount of storage room for customer’s cars not currently needed for unloading or awaiting disposition

Mercer Yard and Support Track Lengths

Track Description	Track Length	Clear Length	Car Capacity
Mercer Yard Class Tracks (5)	4,341	3,300	50
Engine and Rip Tracks (2)	1,679	1,300	14
Track # 106 Beaver Pass	1,150	800	12
Track # 603 Mercer Pass	1,903	1,500	23
Track # 114 North “Ford” Siding	2,690	2,300	35
Track # 115 South “Ford” Siding	2,034	1,600	24
Track # 116 Inland Container Siding	1,066	700	10
Totals	14,863	11,500	168

Table 7.1

- Room for a small service facility accommodating DGNO’s locally assigned locomotive power
 - A track for temporarily holding cars needing repair
 - Room for ground storage of materials used by the right-of-way and track crews
 - The historic Cotton Belt Depot provides office space
- In addition, part of the track network at the yard permits the DGNO’s rock train room to run its engine around the train.

The practice of holding rolling stock (freight cars) required that the study team also account for existing sidings out on the DART lines used for this purpose. A summary of Mercer Yard's standing car capacity along with the associated storage tracks is shown in Table 7.1.

In practice, DGNO also uses inactive customer sidings to temporarily store cars, however an analysis of the siding capacity was beyond the scope of this study.

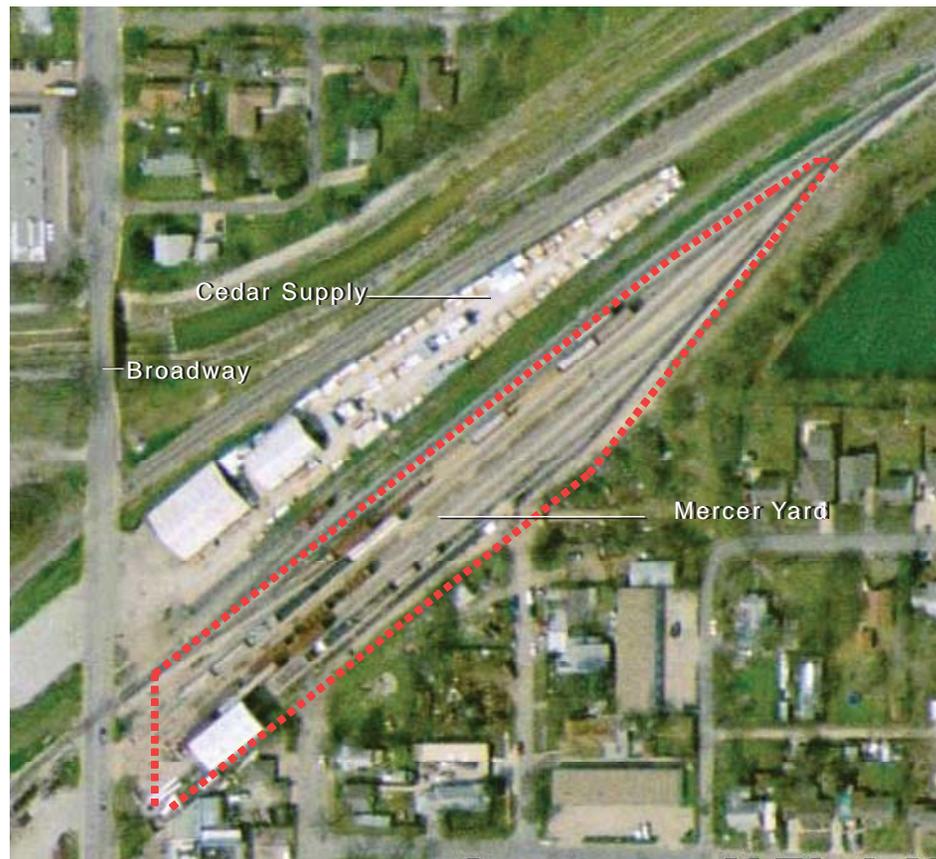


Figure 7.1: Current Mercer Yard

Relocation Goals

- Enhance Development Potential
- Release Real Estate for Commercial Transit Oriented Development
- Provide Necessary Space for Multi-Modal Station
- Reduce Grade Crossing Conflicts
- Improve Land Use Compatibility
- Facilitate Future Passenger Movements

Current Mercer Yard Operation

- Freight rail hub for NW Dallas
- Distribution point for local traffic
 - Loads/empties to/from Dallas (Mockingbird)
 - Cars sorted – for Carrollton, Lewisville, Addison, Plano, etc.
 - Staging customer cars
- Locomotive maintenance
- Material storage

7. Mercer Yard

continued

Potential Sites for Mercer Yard Relocation

Because of substantial costs and impacts posed by the Mercer Yard relocation, an alternatives analysis of potential relocation sites was performed. The study team identified five potential options for relocating Mercer Yard functions. These included:

1. Expand Mockingbird Yard
2. Relocate Mercer Yard to South Irving
3. Relocate Mercer Yard on the current northwest hub of lines:
 - a. IH-35E and Crosby Road
 - b. Belt Line Road and Luna Road
 - c. North of State Highway 121
 - d. East Belt Line Industrial Area

The last four sites are shown in Figure 7.2.

The study group found options 1 and 2 to be infeasible because they both would require DGNO locals, in addition to the “hauler,” to operate over one or both of the TRE and the Madill Subdivisions. Conflicts with existing traffic on these lines and a shortage of available space were judged to be fatal flaws.

The other four sites were evaluated using a matrix of attributes developed by the study team. One set of attributes evaluated the sites against criteria judged to be important to the community while the other set contained criteria important to rail operations. This information is summarized in Tables 7.2 and 7.3.

In all cases, the four candidate sites were compared to the existing Mercer Yard (Shown as “Downtown”) as a reference.

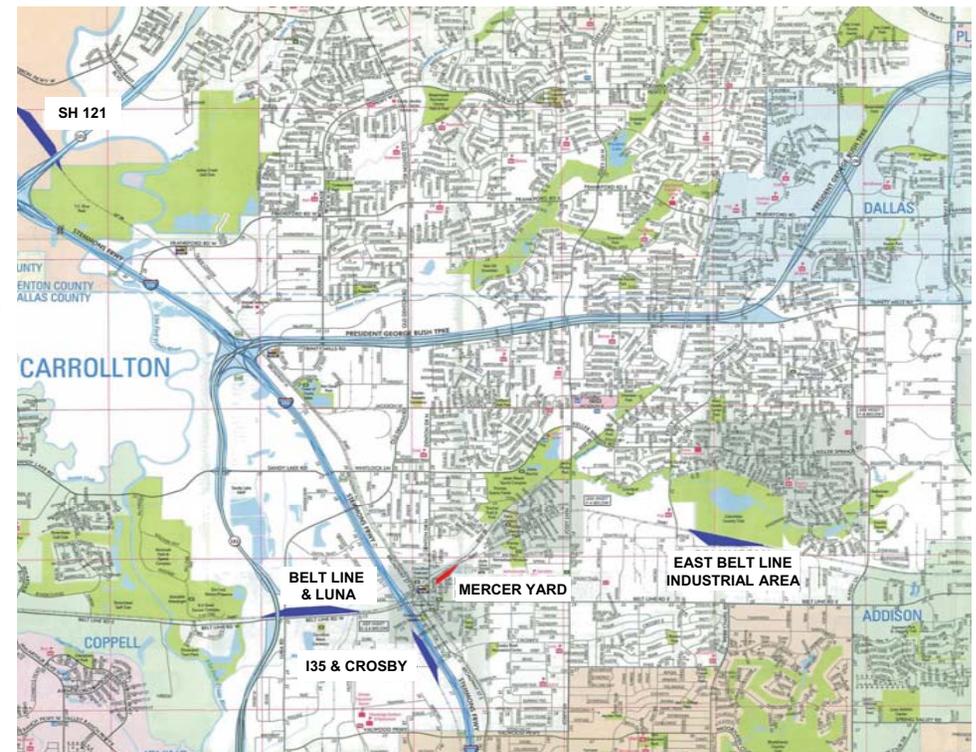


Figure 7.2: Mercer Yard Alternative Sites

Table 7.2
Community Attributes for Relocated Yard

-  Undesirable
-  Neutral
-  Desirable

<i>Attribute</i>	Downtown (Existing)	East Belt Line Industrial Area	Belt Line & Luna Road	IH-35E & Crosby Rd	North of SH 121
Frees Real Estate for Transit Oriented Dev.	○	●	●	●	●
Yarding Train Blocks Road Crossing	○	●	○	●	○
Switching Blocks Road Crossing	◐	●	◐	●	●
Requires Road/RR Grade Separation	●	●	●	○	●
Industrial/Compatible Land Use	○	●	●	●	●
Adjoining Residential Land Uses	○	◐	●	●	◐
Operations Conflict with Future Station Ops	○	●	○	○	○
Real Estate Available	●	●	●	○	●
Site Preparation	●	◐	◐	○	◐

Table 7.3
Operations Attributes for Relocated Yard

-  Undesirable
-  Neutral
-  Desirable

<i>Attribute</i>	Downtown (Existing)	East Beltline Industrial Area	Belt Line & Luna Road	IH-35E & Crosby Rd	North of SH 121
Natural Route For Freight	●	◐	○	●	◐
Direct Move to/from Mockingbird	○	●	○	●	○
Direct Move to/from Addison	●	●	●	●	●
Direct Move to/from Lewisville	○	●	○	○	●
Direct Move to/from Sherman	○	○	●	●	●
Space for Track Expansion	○	●	◐	○	●
Additional Track for Run Around	●	◐	●	●	○
Room for String of 75 Cars	○	●	○	○	●
Area for Material Storage	●	●	●	○	●
Yard Moves Congest Madill Sub	○	●	○	○	○

Mercer Yard Carrollton Customers

- Carrollton rail freight users, all lines
 - International Paper
 - Inland Container
 - Weyerhaeuser
 - Presto
 - CTX Building Supply
 - 11 Other Smaller Shippers
- 3600 Carrollton annual car loads per year (40%)



7. Mercer Yard

continued

The East Belt Line Industrial Area provided the most advantageous location to both DGNO and the City of Carrollton.

The advantages of the East Belt Line Industrial Area option include availability of sufficient property with minimal community impacts, compatible adjoining land uses, few grade crossing impacts, maintenance of existing freight service and accommodation for future passenger developments on the Crosstown Line.

The order-of-magnitude estimated cost for relocating the functions of Mercer Yard to the East Belt Line Industrial Park is \$7.5 million. Not included in the estimate are right-of-way acquisition, the run-around track for DGNO's rock train, and any moving expenses. Before DART, the City and DGNO reach consensus final consensus on the East Belt Line Industrial

Area as the best location for the Mercer Yard functions, a conceptual design must be developed showing how the new facility would be operated.

The profile of the new yard must also be reconciled to a significant grade that rises along the rail line, from west to east.

Alternatives for Freight Service with New Yard and Passenger Services

The impacts on freight from passenger services are best viewed in the context of having Mercer Yard closed and relocated to the East Belt Line Industrial Park. As noted previously, when the number of passenger operations at the Carrollton Station increase, Mercer Yard becomes increasingly difficult to operate in an efficient manner. Already, there is little in the way of spare capacity. The congestion caused by having numerous slow

moving freight trains, in addition to the BNSF through trains, combined with a need for fast, frequent passenger trains in the immediate vicinity, is not a good formula for success.

Addition of DCTA Service

The largest impact of the DCTA service is the likelihood that at least some of the freight service on the northern portion of the Katy, towards Lewisville, will have to be provided at night. How much is dependant on where DCTA finally decides to make the transfer to DART in the early stages of its existence. If the line comes all the way to downtown Carrollton, most of the freight service will have to be provided at night. This means that cars delivered early in the morning by the "hauler" for the north end of the Katy will not be able to be transferred immediately to a local train. They will have to be held in the yard during the day.

Similarly, cars arriving back on the local in the early morning will have to be held in the yard all day until the "hauler" runs in the evening.

The delay in car movement creates the need for additional space and can potentially cost DGNO increases to its "car hire" account. Railroads must pay rolling stock owners "hire" (fee for time used) while the freight cars are on their line. The estimated impact on increased space requirements is 2,400 feet of track; the equivalent of 38 freight cars. In addition, another 2,400 feet of track space will be required for displaced mechanical and storage tracks.

Mercer Yard Relocation

East Beltline Yard Location - Estimate of Probable Costs

Off-Site Mitigation	\$467,600
Country Club Access Road	
Detention Mitigation	
Drainage Structure	
Yard Civil	\$1,242,800
Excavation (Cut)	
Embankment (Fill)	
MSE Walls	
Subballast	
Clearing & Grubbing	
Trackwork	\$3,600,000
Maintenance Structure	\$403,200
Subtotal	\$5,713,600
Contingency (30%)	\$1,714,080
Total	\$7,427,680

Real estate costs are not included



Figure 7.3: Preferred Site

Preferred Site - East Belt Line Industrial Area

- Sufficient real estate for efficient yard
- Maintain existing freight utility
- Accommodation for future passenger
- Space for expansion
- Least road crossing impacts
- Compatible adjoining land uses
- Reasonable site preparation expenses
- Improved Country Club access

Table 7.4: East Belt Line Cost

7. Mercer Yard

continued

Addition of Crosstown Passenger Service

Passenger service on the BNSF (Frisco) will not have a significant impact on the local freight service because DGNO is not the provider on the Madill Subdivision. The Crosstown service, on the other hand, will have a significant impact because the Cotton Belt right-of-way in which it will operate is the same that many freight customers are served from. For this analysis, it was assumed that the Crosstown passenger trains will operate on tracks separate from the existing DGNO track between Downtown Carrollton and the new yard at East Belt Line Industrial Park.

Table 7.5 shows the percentage of DGNO's Cotton Belt business that can be served if there is a separate freight track to gain access to the customers. Whether there will be a need to have a dedicated freight track to support the

rock train movements depends on whether the BNSF can move trains during the daytime over the Madill Subdivision. If an intensive commuter operation is developed on that line, the rock train may be running at night anyway.

If a separate freight track is not provided to serve at least some of the customers on the Cotton Belt during daylight hours, then additional storage room will have to be provided in the new East Belt Line yard to hold additional cars there (the same situation already discussed for DCTA).

The study team estimates that an additional 1,000 feet of track (the equivalent of 15 freight cars) will be required in the new yard for daily operations. That is over and above the Katy Denton line requirement. In addition, 6,400 feet of storage track space will have to be replaced.

At this time, the relocation of Mercer Yard to the East Belt Line Industrial Area should not cause any customers to lose service. Some customers may object to service in the evening hours if local freight trains are precluded from day time operation. That will not be known until a customer by customer survey is performed and that is beyond the scope of this report. If separate freight tracks leading into and out of the new yard to freight customers are provided, many customers can continue to receive service during daylight hours.

Physically, the only customers that will be hard to reach are the two south of Downtown Carrollton where DART construction will cause the former Katy to be severed to the south and the full build-out of potential passenger services will cut off access from the north. Based on the timing of current

DART plans for these build-outs, there is a strong possibility these customers could be relocated elsewhere in the Carrollton area.

Cotton Belt Route Segment, West to East	Est. Total Annual Traffic	Percent	Cum. Percent	Cum. Percent of Car Loads
Carrollton to Kelly Blvd.	671	6.8	6.8	13.7
Kelly Blvd. to east end of proposed yard	1840	18.8	25.6	51.4
East end proposed yard to Addison	240	2.4	28.0	56.3
Dalnor	1382	14.1	42.1	84.6
Addison to Plano (car loads)	750	7.7	49.8	100.0
Addison to Plano (rock)	4913	50.2	100.0	
Total	9796	100.0		

Table 7.5: DGNO Freight Traffic - Carrollton and East
(Number of Rail Cars)

Relocation Costs

- Yard Cost Components
 - Site Acquisition
 - Site Preparation/
Environmental
 - Track Construction
 - Buildings and Other
Facilities
 - Utilities
 - Contingencies
- Order of Magnitude Cost:
\$7.5 million

8. Plan for Passenger Rail Service

Work to Date by DART

The preliminary design work that has been done at the Downtown Carrollton Station site focused on providing infrastructure for the DART Northwest LRT project. DART made no assumption about the relocation of Mercer Yard and did not include detailed provisions for future Crosstown service because it was not a component of their System Plan at the time. The current DART plan is shown in Figure 6.3. Noted in that plan is a conflict between the future Crosstown platform length and the proposed Main/Denton connector.

In addition, the DART plan provides for a new freight connection between the BNSF Madill Sub and the Katy line to Lewisville. What this plan did not provide for was a potential platforms for Crosstown and Frisco service and the proposed DCTA service, nor did it

provide for a way to get from Mercer Yard to the BNSF to use the new freight connection. Also at issue was the ability of the current DART structural design to provide room for any future tracks required for the potential BNSF and Crosstown services.

Design Goals

There are many worthwhile goals to pursue in the design of the Downtown Carrollton Station and freight operations in the immediate vicinity.

Maximizing future passenger utility has additional dimensions. First, there is the desire to provide room to give the facility as high a capacity as possible (in terms of numbers and lengths of trains). Second, the arrangement of the platforms and tracks must make passenger access and connections as convenient as possible. Third, the ability to interconnect lines is

desirable to maintain flexibility and meet future passenger demands.

Assumptions

Following are the general assumptions about the site at the Carrollton Station:

- DCTA trains terminate at Downtown Carrollton
- The station must be able to accommodate all passenger services
- Belt Line Road is lowered
- Cedar Wood Supply is moved
- Mercer Yard is moved but a run-around for the rock train must be provided for
- Connectivity between passenger lines is to be promoted to the extent possible
- There is flexibility to grade separate Denton Drive and Broadway Street, if needed

Other assumptions more pertinent to engineering design include:

- Level boarding platforms in accordance with the Americans with Disabilities ACT will be required
- Tracks must be tangent (straight) through the platforms
- Platforms are designed for a nominal 400 feet (4 cars at 85 feet per car)
- Freight by-pass tracks will be provided to eliminate clearance and schedule issues

Design Cases

The single most difficult design factor in the Downtown Carrollton Station is that the three rail lines which are candidates for passenger services all now cross at grade. (See Figure 6.1 for a review of the existing freight network). There are currently three railroad grade crossings within a 140-foot diameter circle. While

the south leg of the Katy line is expected to be phased out over time, doing so still leaves two lines where traffic paths cross. The BNSF freight service must also cross the Cotton Belt. Further, it seems that the predominant desire for passenger service on the lines would have them crossing, in addition to freight.

Since the DART NW LRT extension is already designed as an aerial structure, and Belt Line Road is going to be lowered, the opportunities to grade-separate the other two rail lines to avoid conflicts are limited. Another design constraint is presented by two local roads which cross the rail lines at the station site. Finally, there is a geometric constraint on the alignment of the Frisco line entering the site from South Irving. It passes under IH-35 and has a designated path through the freeway's support columns. There is a second

parallel path through the column maze to the south of the existing track, where another track might be constructed. But the number of tracks is fixed and the "alignment" relatively fixed, unless there is a major reconstruction of the existing freeway lanes.

Design flexibility at the station site would be maximized if all passenger vehicles were to be of the same type. Heavy locomotives and railcars used in commuter-type services are not compatible with lighter LRT and LRT-like Diesel-Multiple-Unit (DMU) cars. At this time, it is not possible to determine what types of equipment will be utilized on the three passenger lines connecting with DART at Downtown Carrollton.

The grade separation of the DART Northwest LRT Extension removes any potential conflict between their LRTs and any new vehicles

Passenger Service Goals

- Maximize the future utility of the site for passenger service
- Minimize the impact wherever possible on the in-progress DART design
- Maintain freight utility and improve it if possible
- Maximize the amount of land that can be developed in support of a transit hub
- Minimize the impact of rail/highway grade crossings
- Provide for the best linkage of rail services to the community

8. Plan for Passenger Rail Service

continued

introduced by other services. All of the remaining services, however, must be at or near ground level. The DCTA service is aligned parallel to the DART route and is now in preliminary design however, a vehicle type has not been selected. The potential BNSF (Frisco) service will run on freight right-of-way north of the Downtown Carrollton station, where existing development could make widening it difficult. It is likely that Frisco service would be provided by vehicles compatible with freight.

The potential design combinations evolved into three potential combinations of modes based on transportation provider input.

1. The Frisco and Crosstown services use the same vehicle technology and share a common platform
2. The Frisco and Crosstown services use different vehicle

technologies and cross-platform changes are provided between these services

3. The Frisco and Crosstown services use different vehicle technologies and each uses its own platform

The relative advantages and disadvantages of each are discussed in the following sections.

Design Case One

Design case one requires only one shared platform for Frisco and Crosstown. It results in a relatively simple track network and if these services use “freight compatible” vehicles, all tracks, including the crossing points, will have to be at-grade.

This option takes the least space and can accommodate the two freight by-pass tracks. The by-pass on the south side can be designed for 30 MPH freight

movements, which will get the BNSF traffic through the site faster. It can be designed without moving the foundations of the present DART aerial structure, although some columns may require hardening for crash protection. The trial layout (Figure 8.1) confirmed that parallel moves could be made into and out of the station area for trains on the same route on the east end of the site.

On the west end, one rail crossing was retained for passenger moves, but otherwise parallel moves into and out of the Carrollton Station by trains on the same route are possible.

The disadvantage of this arrangement is that sharing the platform reduces the capacity by increasing headways (time between trains) on the two lines. Effectively, it would act as a section of single track for each line. For commuter rail, this

may not be a serious issue unless the demand is high enough to drive headways below 20 minutes on one or both lines. Cross-platform changes between the two lines are possible, but they are only possible between one pair of trains at a time. For example, an outbound Frisco train could connect with either a D/FW or Addison-bound Crosstown train, but not both.

Given that there will be an additional desire to coordinate the train schedules with DART service, train arrival times at the station will serve as fixed points in developing any service plan for the Crosstown and Frisco lines. Minor delays due to weaving of trains could slow the schedule somewhat and this option would provide a possible constraint to schedule recovery in times of peak traffic.

This scenario would also require Crosstown service to be “freight compatible,” a fatal flaw to providing operational flexibility.

The alignment of the DCTA platform can be perpendicular to the Frisco and Crosstown lines and parallel to DART LRT. DCTA could possibly be connected to the Crosstown line, but doing this may require the platform to be moved farther away from the other three services and degrade the passenger transfer.

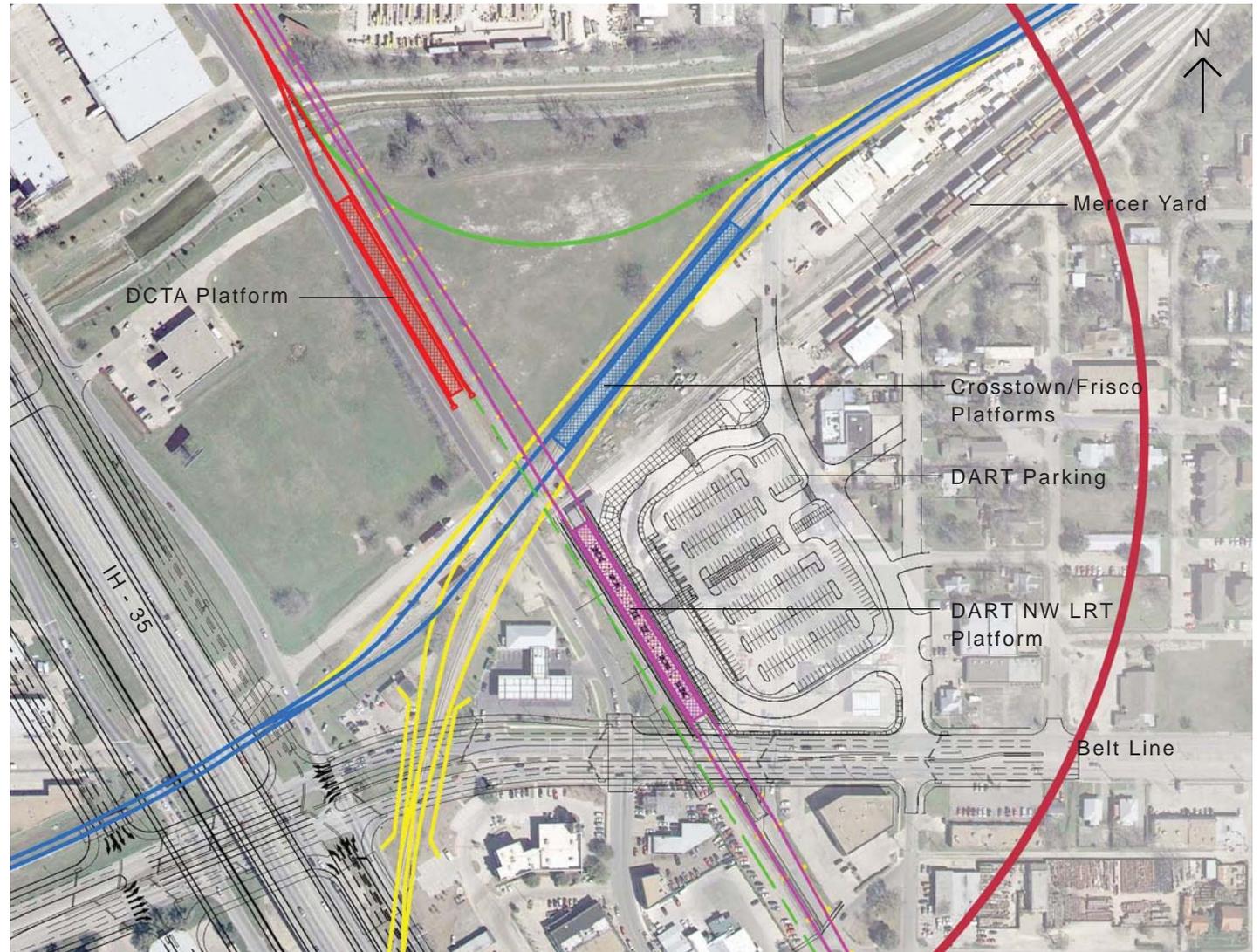


Figure 8.1: Design Case One - Shared Platform

8. Plan for Passenger Rail Service

continued

Design Case Two

Design Case Two provides for two platforms with cross-platform transfers between the Frisco and Crosstown lines. Vertical circulation in the form of elevators and stairs will be necessary for DART and DCTA transfers. The design case assumed a worse-case in that one passenger railcar technology was freight compatible and one was not. Making this assumption means that where the services must cross, or “weave,” grade separations will be required. Because the Frisco service must share a through freight corridor, it was assumed to be freight compatible. While waivers are possible from FRA to permit these services to operate with at-grade crossings, as the service headways are reduced, any waiver conditions imposed by FRA conditions may place limitations on capacity. Therefore a conservative approach was to provide for grade

separations and maximum capacity.

Assumed in this case is that the Crosstown line would be built on the north portion of the Cotton Belt right-of-way east of the station area. In this design case, the Crosstown service would “fly over” (be grade separated from) the freight lead connecting the Madill Sub with the future East Belt Line Yard. It would also “fly over” the Madill Sub and would descend to occupy the space between the two platforms at the Downtown Station. The southbound Frisco track would be to the north of the Crosstown tracks and share a platform with the Crosstown track headed west for DFW. This arrangement requires both Crosstown tracks to “cross under” the southbound Frisco track between the station and the IH-35 overhead structure. With the Belt Line connector roads depressed, the Crosstown line

must gain elevation quickly to get over them after crossing under the Frisco. The rapid “cross under” of the Crosstown Line can be accomplished within normal vehicle geometric parameters, but it cannot be accomplished within DART’s infrastructure criteria for vertical curvature.

In this design case, the DCTA platform can still be aligned with the DART aerial structure north of the Frisco and Crosstown platforms.

It is a virtual certainty that Broadway would have to be grade-separated when this arrangement is fully built out. Geometrically, Denton Drive might still fit at grade with the relocation of Mercer Yard, but train frequencies could require that crossing gates would be in the down position a significant portion of the time.

This arrangement would provide

the best connectivity and would provide significant scheduling flexibility because the rail services do not conflict with one another entering or leaving the station. Many different combinations of timed transfers would be possible, a potential benefit if trends for reverse commutes and off-peak ridership continue. This design concept will easily permit 15 minute headways or less at the station.

Design Case Two will require more property east of the station area than Design Case One.

8. Plan for Passenger Rail Service

continued

Design Case Three - Preferred

Design Case Three is similar to Design Case Two, except that each service has a dedicated platform. Cross-platform changes between Frisco and Crosstown services are lost, but there is no complicated “cross under” on the west end of the station. The Crosstown tracks would again “fly over” the proposed East Belt Line yard lead and the Madill Sub at the east end of the station.

But in this case, both Crosstown tracks descend to occupy the most northern of the two platforms. As the Crosstown tracks head to the west, they are no longer in conflict with any Frisco tracks. The DCTA platform fits to the north, aligned with the DART aerial structure as before. A schematic diagram of Design Case Three is shown in Figure 8.3.

Whether the loss of direct cross-platform transfers between the

Frisco and Crosstown services is significant or not depends on future ridership trends. Current forecasts indicate the highest transfers are between Crosstown service and the DART Northwest LRT service. As the two newer lines are still 10 to 20 years in the future the arrangement of these lines at the platforms can be revisited should ridership patterns change.

Design Case Three also results in no “weaving” conflicts between Crosstown and Frisco services, which maximizes scheduling flexibility and operating capacity. It can also accommodate service headways of 15 minutes or less.

While the elimination of the “cross-under” could possibly allow Broadway Street to remain at grade, a grade separation may be preferred.

The land requirements for Case Three are about the same as for Case Two.

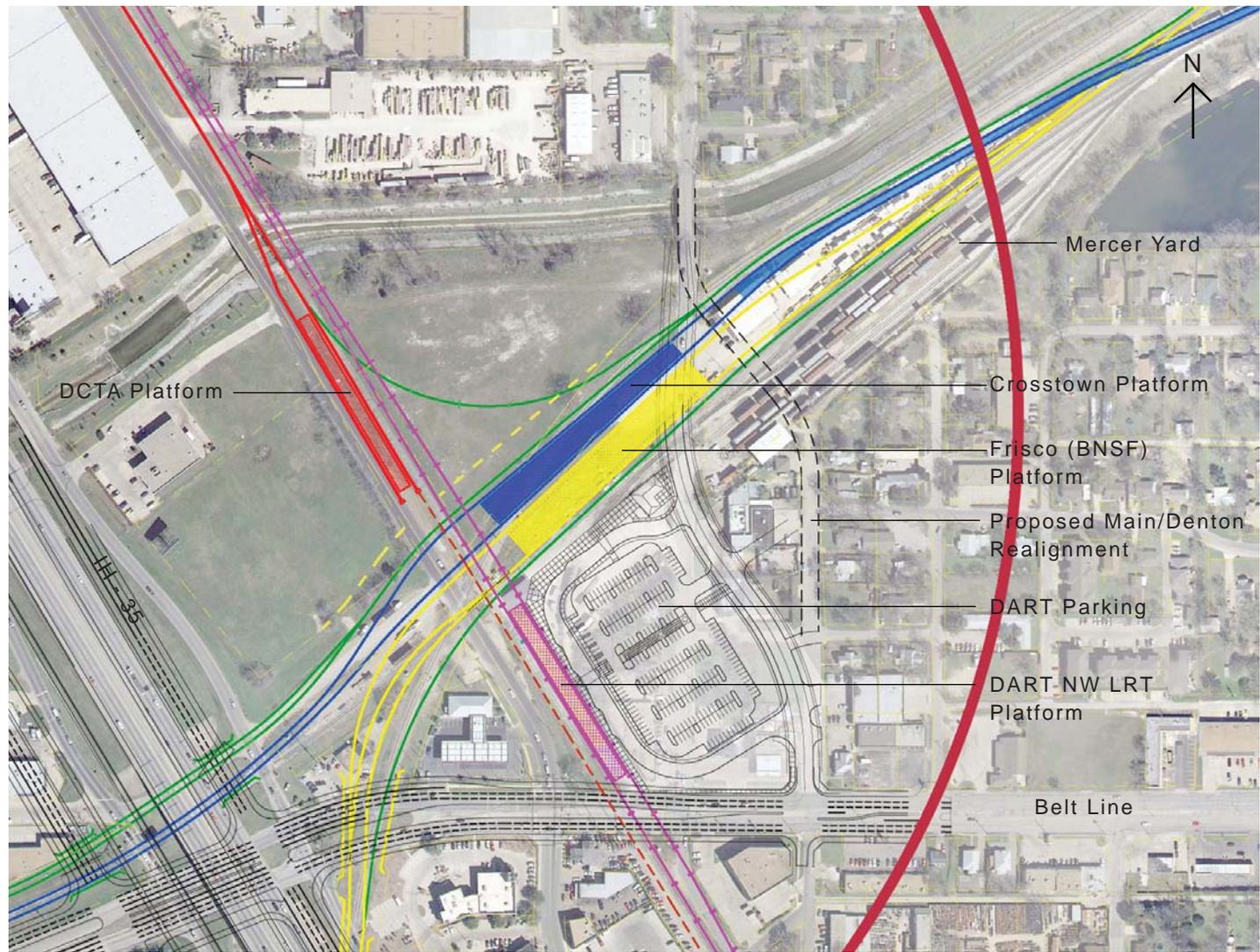


Figure 8.3: Design Case Three - Preferred Option
Two Platforms - Independent



8. Plan for Passenger Rail Service

continued

Design Summary

The testing of the site with the three cases reveals that there is room for the Downtown Carrollton Station at its full build-out capacity. Some of the important lessons learned include:

- The existing DART aerial structure will accommodate the Crosstown, Frisco and freight track configuration and provide vertical circulation within the existing column configurations.
- The connection between the Madill Sub and the Katy freight line will require crash resistant columns in the DART aerial structure in more than one location due to proximity of freight rail lines. (DART is currently incorporating this requirement).
- Plans for the full build-out of the station need to include for the possibility that Broadway and Denton Drive may have to be grade separated in the future.
- The lowering of Belt Line Road needs to consider the following:
 - Belt Line Rd needs to be low enough for a long enough distance to accommodate more than one overhead railway bridge
 - The east side frontage road to IH-35 needs to be kept at a low enough elevation to allow for the “cross-under” of Design Case Two to be built if shifting patronage forecasts warrant
- The through freight movements on the Madill Subdivision can be designed for 30 MPH.
- The run-around for the DGNO rock train can be accommodated in all cases.
- The DCTA line can be connected to the Crosstown with some difficulties, including:
 - The run-around track for the rock train would likely have to be relocated. At this time, it is not clear at what location
 - The DCTA platform might have to be moved even further north from the DART platform
 - The connection would probably be single-tracked
- The freight track to the two customers south of Downtown Carrollton will have to be removed to accommodate future Crosstown and Frisco services.
- The design for widening IH-35 needs to be checked as it progresses to make sure that it does not interfere with track layouts, especially the provision of one or more additional tracks on the route to South Irving.
- The rearrangement of tracks on the east end of the station track network will require negotiations with BNSF.
- Mercer Yard must be moved to accommodate the Crosstown and Frisco services.



9. Passenger Station Operations

The transportation function at the station must be more than passenger exchange between separate transportation modes, parking and pedestrians. Connectivity has to occur between transportation components, services and passenger amenities in order to allow for a convenient and rewarding passenger experience. This connectivity must occur within a high quality, attractive, safe and secure environment to establish the facility as a place to be as opposed to a place to pass through. The key issues defined as the guiding principles for the station area are:

- Creation of a place (town center)
- Linkage between station platforms
- Integration of retail and parking
- Integration with joint development
- Linkages to community
- Passenger comfort and safety
- Enhanced image of transportation
- Integration of the planned DART Station with the facility

Passenger Operations Assumptions

Transportation provider workshops were used as a tool for achieving consensus on operations assumptions to be used for the study. While assumptions may change during the course of the study, the following were documented as the “working” assumptions of each transportation provider for the purpose of initiating the study.

DART

- LRT service to Frankford Road
- Aerial alignment / aerial station at downtown Carrollton
- 10 minute peak headways

DCTA

- Commuter Rail service from Denton to downtown Carrollton
- Passengers transfer at Downtown Carrollton *
- At-grade alignment
- No DCTA interline connection to Cotton Belt (Crosstown)/BNSF (FRISCO)
- 20 minute peak headways

Crosstown (Cotton Belt)

- “Non-compliant” commuter rail or light rail vehicles
- At-grade alignment at station (grade separated from DART LRT)

BNSF (Frisco/Irving)

- “Compliant” commuter rail vehicles
- At-grade alignment utilizing freight tracks, with freight by pass at passenger platforms

Passenger Service Schedule Assumptions

- DART LRT revenue service: December 2010
- DCTA revenue service: 2010*
- DART Crosstown service: 2020 – 2030
- BNSF (Frisco / Irving Line): not determined

Station Requirements

- DCTA boarding platform characteristics
 - 400 feet long (nominally 4 cars)
 - Tangent straight alignment
 - Level boarding (raised platform)
- Crosstown and Frisco platform characteristics
 - Nominally 400 feet long (4 cars)
 - Minimum 28 feet width to allow for vertical circulation
 - Tangent straight alignment
 - Level boarding (raised platform)
- DART Platform
 - 385 feet long
 - Aerial center platform station (elevated)
- Platform pedestrian connections
 - Cross platform access between Crosstown and Frisco
 - Vertical to DART/DCTA
- Minimize impact of freight trains

* DCTA is currently evaluating interim service plans to provide transfers between DCTA and DART at the DART Trinity Mills station by cross platform transfers. Under this scenario DCTA service would be extended to downtown Carrollton on initiation of the Crosstown service in the 2020-2030 time frame. The overall impact on the master plan is unchanged. However phasing plans may need to incorporate the interim service.

Station Development Issues

- Creation of a place (town center)
- Linkage between station platforms
- Integration of retail / parking
- Integration with joint development
- Linkages to community
- Passenger comfort/safety
- Enhanced image of transportation
- Integration of the planned DART Station

10. Patronage Projections

The initial projections by DART for ridership on the Northwest LRT line were documented in the Final Environmental Impact Statement (FEIS), Northwest Corridor (October 2003). In that report, the following forecast were presented.

2030 DART LRT Station Ridership	
Frankford	2,294
Trinity Mills	2,561
Downtown	1,429
Total	6,284

Additional ridership analysis has been done by DART for the Downtown Carrollton Station to establish the ridership for all modes proposed to operate from the station capturing transfers between stations and access by bus, automobile and pedestrians. However, the projected transfers do not necessarily capture all “life cycle” considerations.

When all modes are fully operational (projected 2030) 7,617 passengers are estimated to make daily transfers at the station. ⁽¹⁾ In addition, 275 riders are projected to arrive by car, 185 by walking and 915 by bus for a total daily ridership of 8,992 daily boardings. Alightings (off-loading of passengers) are slightly higher (9,756) due to bus transfers and pedestrian activity. This translates into a peak-hour ridership of 1,800 passengers based on a 20% peak hour factor. The peak-hour patronage will be used to assess circulation and platform width needs in Phase 2 of the project. Adding boardings and alightings results in a total of almost 19,000 passengers per day passing through the station.

Figure 10.1 provides boarding and alightings for each transportation provider (mode) based on 2030 projections. The primary ridership

demand is governed by transfers between modes with the heaviest activity represented by boardings from DCTA and BNSF to DART Northwest LRT.

Alightings are essentially the inverse of the boardings for each mode. Bus transfers represent approximately 5% of the ridership.

The ridership model does not currently take into account downtown Carrollton as a destination location with future transit-oriented development. The regional travel demand model is based on a regional scale and overall population center growth, therefore it does not take into account activity that occurs at a micro scale. Future development may increase the total ridership at the station, particularly that of walk-on riders. In order to provide a more detailed location specific ridership model, a micro scale ridership evaluation will be

overlaid with the regional model based on projected land use and total build-out of the master plan. This post-ridership model processing will be developed in Phase 2 of the project based on the market demand study which is currently in development by Leland Consulting for the City of Carrollton.

⁽¹⁾ Ridership data provided by DART based on Model Run 2-8.

2030 Total, Multi-Agency Patronage Summary	
Daily Passenger Boardings	
FRISCO	410
CROSSTOWN	1,210
DCTA	479
DART NW	6,893
Total	8,992
Daily Passenger Alightings	
FRISCO	3,595
CROSSTOWN	1,667
DCTA	3,131
DART NW	1,363
Total	9,756
Total Daily Passengers	18,748

PATRONAGE PROJECTION SUMMARY

Source: DART 2030 Transit System Plan Model Run 2-8

BOARDINGS				TRANSFERS		ALIGHTINGS				
AUTO	PED	BUS	RAIL			RAIL	AUTO	PED	BUS	
			DCTA X-TOWN NW LRT	154 129 24		FRISCO (BNSF)		DCTA X-TOWN NW LRT	98 442 2676	
14	9	80	307	= 410		= 3595	3216	14	10	355
			DCTA NW LRT FRISCO	471 110 442		X-TOWN		DCTA NW LRT FRISCO	55 1202 129	
27	30	130	1023	= 1210		= 1667	1386	27	0	254
			NW LRT X-TOWN FRISCO	88 55 98		DCTA		NW LRT X-TOWN FRISCO	2168 471 154	
15	2	221	241	= 479		= 3131	2793	15	5	318
			FRISCO X-TOWN DCTA	2676 1202 2168		DART NW LRT		FRISCO X-TOWN DCTA	24 110 88	
219	144	484	6046	= 6893		= 1363	222	219	14	908
275	185	915	7617	= 8992		= 9756	7617	275	29	1835

Figure 10.1: Patronage Projection



11. Access/Parking Requirements

Access

Based on the proposed design of the DART Downtown Carrollton Station, Denton Drive will be realigned to connect with Main Street at Belt Line Road. With the lowering of Belt Line Road, Main Street will be the first at-grade intersection east of IH-35, making Main Street and Denton Drive the primary access road for the Downtown Carrollton Station area.

The intersection of Belt Line Road and Main Street will be signalized, and will include dedicated turn lanes for traffic turning north to the Downtown Carrollton Station and south to downtown Carrollton. Jackson Street will be a secondary access route, connecting to the station via Oak and Walnut Streets.

The DART NW LRT line will be elevated from south of Crosby Road to just north of Hutton Branch. This

traffic along Belt Line Road, Fourth Street and Crosby Road by the light rail trains. There are currently no plans to discontinue freight rail operations at grade along the Katy (Union Pacific) corridor to serve the existing railroad customers.

Crosstown and Frisco (BNSF) passenger service will increase conflicts with at-grade vehicular traffic on Denton Drive and Broadway Street crossing the Cotton Belt and BNSF tracks. In order to continue use of Denton Drive and Broadway connecting to roadways north of the Downtown Carrollton Station area, it may be necessary to consider alternative improvements including a possible grade separation, with Denton Drive passing over or under the Cotton Belt and BNSF railroads.

Parking

The Downtown Carrollton Station will be a major rail-to-rail transfer center between DART LRT, DCTA and future Crosstown and Frisco service. In addition, the station-area development anticipated after DART begins serving the station may increase the parking requirements in the station area.

The DART station is expected to attract significant development and redevelopment in the downtown Carrollton area. There is a vacant, large (approximately 12 acres) area to the north and northwest of the proposed station location. Such undeveloped properties present potential for development in the area. In addition, there are large industrial land parcels that could redevelop if sufficient economic pressure were to exist. Therefore, a number of new development and redevelopment projects are anticipated to occur when the DART LRT

service begins operation. These developments will increase mobility and parking needs in the area.

Year 2030 patronage projections indicate the need for approximately 275 parking spaces, six kiss-and-ride spaces, and approximately 11 bus bays at the Downtown Carrollton Station. The estimated parking need is based on ridership forecasts for passengers boarding and alighting by mode of access and will require refinement in Phase 2 to adjust for phasing and the recognition that there will be a reverse commute from Carrollton to Denton not recognized in the patronage model. This reverse commute will be driven in part by student and staff commutes to the University of North Texas and Texas Women's University.

Parking requirements based on 2030 patronage projections as shown in figure 10.1 are illustrated in Table 11.1.

DART is planning to build 262 parking spaces to meet the needs of the downtown DART NW LRT station in 2010. The number of spaces provided is partially based on parking available at the Trinity Mills Station (501 spaces) and North Carrollton/Frankford Station (490 spaces) to the north to meet overall “area” demands. Should development or other considerations change the parking at the outlying stations, or should Crosstown, Frisco or DCTA service not be provided in the 2030 time horizon “overflow” parking may be required in the corridor.

2030 Estimated Parking Demand at Carrollton Rail Station

Based on 2030 Patronage Projections

Project Component	Bus Bays	Kiss & Ride Spaces	Parking Spaces	Average Daily Passenger Volume*
DART NW Corridor	5	3	219	6,893
DCTA Corridor	1	0	14	410
Crosstown Corridor	2	1	27	1,210
BNSF Corridor	3	0	15	479
Total	11	4	275	8,992

* Boardings

Table 11.1: Parking Demand



11. Access/Parking Requirements

continued

Access and Parking Recommendations

1. Minimize the number of at-grade railroad-roadway crossings. At-grade crossings limit future growth of the area. Eliminating these crossings could significantly benefit the area by improving mobility and access, and stimulating investment in the surrounding areas.
2. Improve intersections of Belt Line Road with Main Street and Jackson Street. These two intersections will be the primary and secondary access routes into the station area. Optimized signal timing, dedicated turn lanes, pedestrian crosswalks and signals, and adequate geometry will promote efficient traffic operations and minimize congestion and delay.
3. Provide direct pedestrian linkages between the station and downtown Carrollton. Connectivity with downtown and the station is essential to successful transit-oriented development.
4. Transit-oriented development in the station area must be provided with adequate parking for its demands. Development must provide additional parking to satisfy increased demand generated by the new uses.
5. Use structured parking. Maximize area available for development by using multilevel parking structures.
6. Integrate parking with retail / residential mixed-use development – Wrap parking structures with retail uses at street level, or residential on the upper levels.
7. Use areas above parking structures for residential or office development – These uses can be stacked over parking on the lower floors or below ground levels.
8. Provide shared parking facilities and develop parking management strategies to optimize use of available parking. Shared parking maximizes efficient use of available parking among mixed uses with different peak parking utilization patterns.



12. Planning Framework Concept

The role of the Downtown Carrollton Station as a gateway to the City will stimulate intense economic development activity that will carry beyond the station area. Cities are competing with each other to retain and attract capital and economic development. The Downtown Carrollton Station is a key component of the City's competitiveness, making the station and its surrounding area increasingly important to attracting development. The physical structuring of the station will be critical to its resulting built form and its relationship to its surroundings. The station must therefore contain a framework to create both a transportation mode and a place. As a result, both transportation and urban development issues must be simultaneously addressed in development of the station master plan. The next phase of the project will address the relationship of the station to surrounding

development. The functional layout of the track geometry and platforms (discussed in Section 8) have set constraints and opportunities for future infill development. The primary components in achieving a functional framework include pedestrian and vehicular access to the community/adjacent development and circulation between boarding platforms through the transportation facility. Functional circulation should enhance and support circulation for the mixed use development that will be addressed in Phase 2.

Pedestrian Framework

Preliminary analysis of passenger circulation between platforms was developed to test the functionality of the preferred platform configuration) discussed in Section 8). The geometry of the preferred platforms and track arrangement provides an obstacle in a successfully connecting the passenger

boarding areas and facilitating passenger transfers. The passenger platforms fall inside the primary freight tracks bypassing the station area. As a result, access to the BNSF (Frisco) and Crosstown platforms from DART and DCTA must be grade-separated.

Figure 12.1, shows possible pedestrian routes between platforms. Access to the Crosstown, BNSF and DCTA platforms can be accommodated by several means. Pedestrian access to the DART LRT will be provided by elevator and stair from ground level. Direct connection to the Crosstown, Frisco and DCTA platform can be accommodated by adding a pedestrian crossing of the northbound track to an elevated walkway providing vertical circulation to the at-grade platforms below. This connection can be enhanced by adding a pedestrian crossing of the northbound DART

track to an elevated walkway leading to vertical circulation to the at-grade platforms below as shown in Figure 12.2. This connection can be enhanced by the addition of a second northbound boarding platform that would provide second level access to the DART station from development immediately east of the station. Access to the DCTA platform would require crossing under the DART LRT guideway to access the platform.

Secondary access directly from adjacent development will supplement the primary access described above. The Crosstown and Frisco platforms may include a center mezzanine access with direct connections to development north and south of the platforms. DCTA may have direct access from development to the west of the Katy alignment. With the addition of elevated side platforms, the DART NW LRT station may have direct

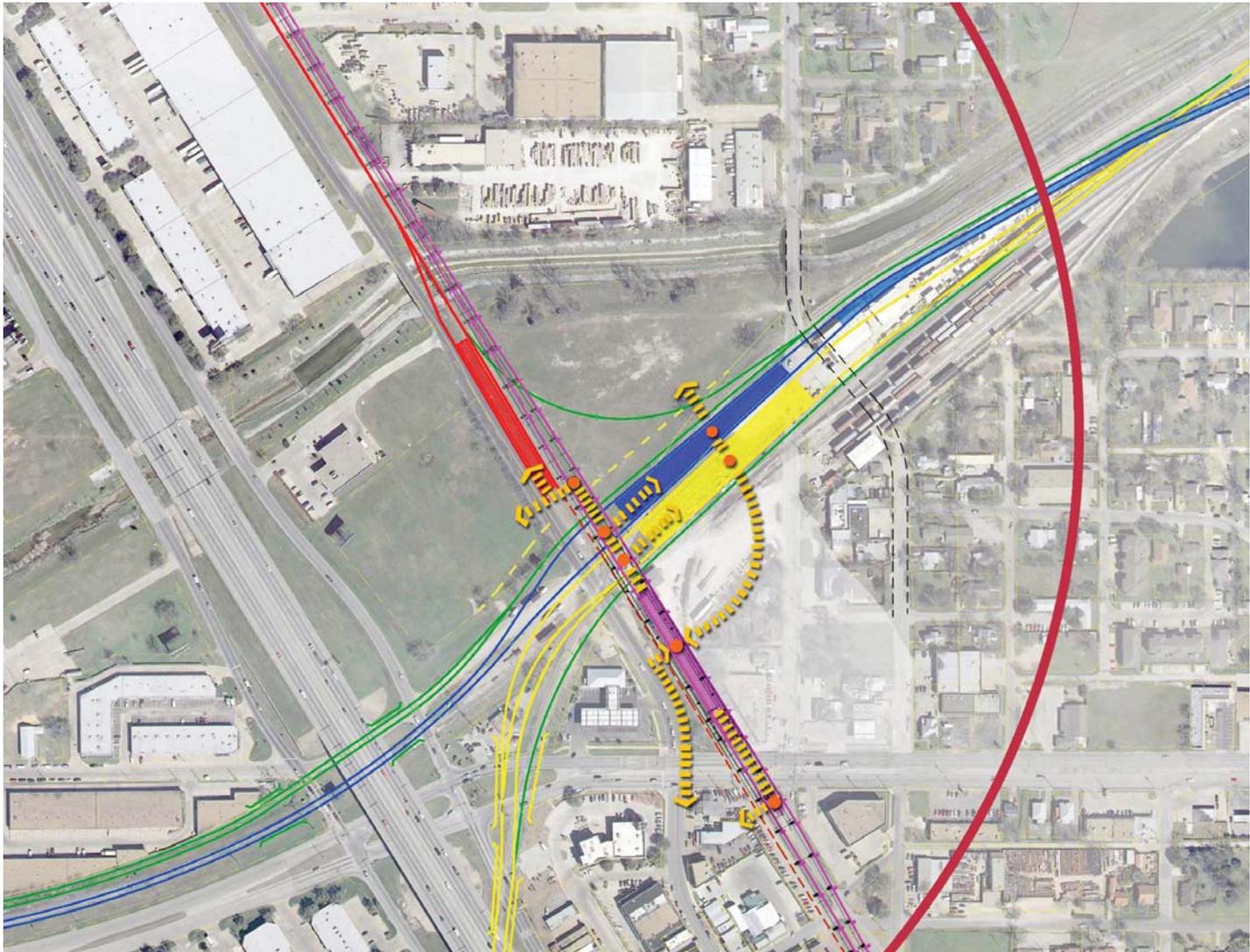


Figure 12.1: Pedestrian Linkages



12. Planning Framework Concept

continued

access at the elevated platform level.

A potential solution for direct circulation between platforms is shown in Figure 12.2. The figure illustrates the relationship between DCTA, Crosstown, BNSF and DART platforms in terms of horizontal and vertical circulation. This concept will be further refined in Phase 2 to integrate private development along the circulation route.

Street System Framework

The existing street network (discussed in Section 11) will require modification due to the introduction of additional passenger and freight rail lines. The Main / Denton connection being relocated by DART will require future modification with the introduction of the Crosstown and/or BNSF service because the platform locations and lengths conflict with the proposed alignment. Main/Denton may also require grade separation with the Crosstown, BNSF and freight lines depending on train headways and traffic volume as previously addressed.

Broadway Street north of Belt Line Road will also require modification due the number of tracks and track geometry in the current Broadway location. Broadway Street may require either severance or a grade separation at the railroad crossing. Further study of this issue will be

investigated in Phase 2 in conjunction with an ongoing traffic study being performed by the City. The traffic study will consider passenger and freight train frequencies and lengths, future traffic volumes determined by the market study and future thoroughfare improvements. Figure 12.3 diagrams the conflicts between the existing streets and future rail operations.

Figure 12.4 illustrates potential development infill that will reinforce both pedestrian and street linkages.

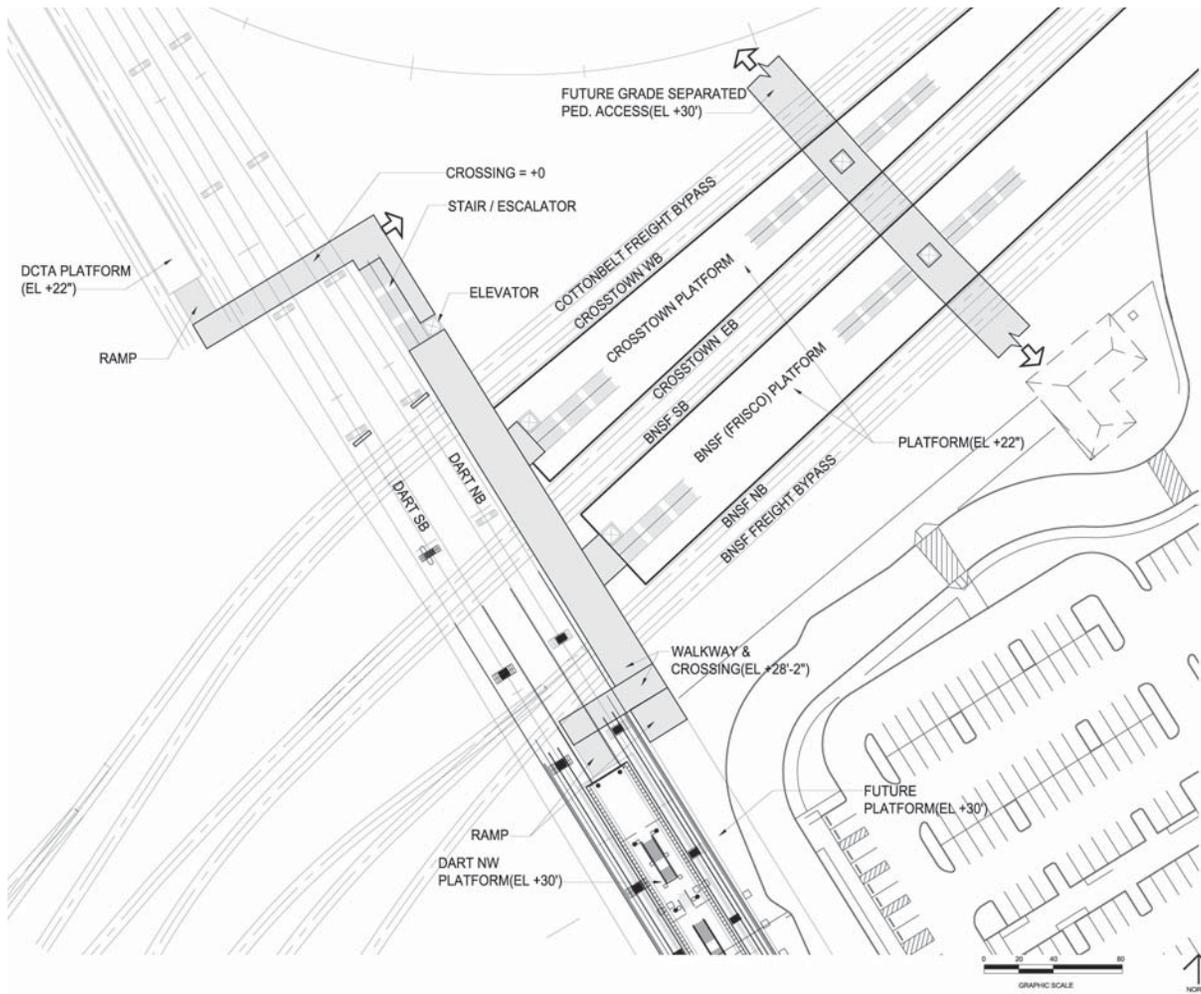


Figure 12.2: Platform Linkages



Figure 12.3: Street Network Linkages



Figure 12.4: Development Linkages



13. Program

Based on the Project Goals and Objectives, a preliminary program was developed to: document passenger transfer; boarding and alighting functions; parking and circulation; bus requirements; and identify passenger amenities and other related elements required by transportation providers and the City of Carrollton. These elements may include enclosed passenger waiting, ticketing, security functions, public restrooms and other public/passenger amenities. The program summary provides an analysis of space requirements for the facility components based on identified needs. The program provides a framework defining the project area and will guide the development of the facility. Further refinement of the program with project stakeholders will be developed in Phase 2 of the project.

Program Components

- DART Northwest LRT Station (planned)
- DART Crosstown Corridor passenger platform
- Frisco/Irving Line (BNSF) Passenger platform
- Denton County Transit Authority (DCTA) passenger platform
- Bus boarding
- Kiss & ride drop off areas
- Passenger waiting / amenities
- Passenger circulation (horizontal & vertical)
- Transit-oriented retail
- The historic depot building
- Pedestrian / bicycle connections
- Parking structure(s)
- Facility support
- Public restrooms

Boarding Platform Requirements

DART NW LRT:	385' boarding platform and concourse
DART Crosstown:	400' at-grade platform 28' minimum width
Frisco/Irving:	400' at-grade platform 28' minimum width
DCTA:	400' at-grade platform 24' minimum width

Carrollton Downtown Rail Station Master Plan

Schedule of Program Assumptions

DART NW Corridor Station

	SPACE REQUIREMENTS			SHARED	NOTES
	Units	Unit Area	SF		
<u>Boarding Platform</u>					
Elevated Boarding Platform	1	10780	10780	N	385' platform length x 28' width
Concourse / Ticketing	1	11025	11025	N	285' x 45'
Service / Communications Building	1	1200	1200	N	
<u>Bus Boarding Area</u>					
Bus Bays	5	1500	7500		
Subtotal: Net Area			30505		
Circulation (Net: Usable)			0		
Subtotal: Usable Area			30,505		<i>sf</i>

DCTA Station

	SPACE REQUIREMENTS			SHARED	NOTES
	Units	Unit Area	SF		
<u>Boarding Platform</u>					
At-Grade Boarding Platform	1	10780	10780	N	400' platform length x 24' width
Crew Building	1	120	120	N	Service Desk / Restroom
<u>Vertical Circulation - End Loaded</u>					
Mezzanine	1	320	320		
Elevator	1	100	100	N	May be shared with Crosstown platform
Stair	1	1080	1080	N	12' Stair width to accommodate future escalators
<u>Bus Boarding Area</u>					
Bus Bays	2	1500	3000	N	Centralized bus area preferred
Subtotal: Net Area			15400		
Circulation (Net: Usable)			0		
Subtotal: Usable Area			15,400		<i>sf</i>

Carrollton Depot Building

	SPACE REQUIREMENTS			NOTES
	Units	Unit Area	SF	
<u>Public Areas</u>				
Shell Space	1	1800	1800	Future use by City of Carrollton
Public Restrooms				
Men	1	48	48	
Women	1	48	48	
Subtotal: Net Area			1,896	
Circulation (Net: Usable)			0	
Total: Usable Area			1,896	<i>sf</i>
Gross Factor (15%)			0.15	284
Total Gross Area			2,180	<i>sf</i>



13. Program

continued

Crosstown Station					
	SPACE REQUIREMENTS			SHARED	NOTES
	Units	Unit Area	SF		
<u>Boarding Platform</u>					
At-Grade Boarding Platform	1	11200	11200	N	400' platform length x 24' width (width varies)
<u>Vertical Circulation - End Loaded</u>					
Mezzanine	1	320	320		Includes ticketing
Elevator	1	100	100	Y	May be shared with Frisco/Irving platform
Stair	1	1080	1080	N	12' Stair width to accommodate future escalators
Future Escalator	1	0	0	N	
<u>Vertical Circulation - Center Loaded</u>					
Mezzanine	1	880	880		Includes ticketing
Elevator	2	100	200	Y	May be shared with Frisco/Irving platform
Stair	1	1080	1080	N	12' Stair width to accommodate future escalators
Future Escalator	1	0	0	N	
<u>Bus Boarding Area</u>					
Bus Bays	2	1500	3000	N	Centralized bus area preferred
Subtotal: Net Area			17860		
Circulation (Net: Usable)			0	0	
Subtotal: Usable Area			17,860	sf	

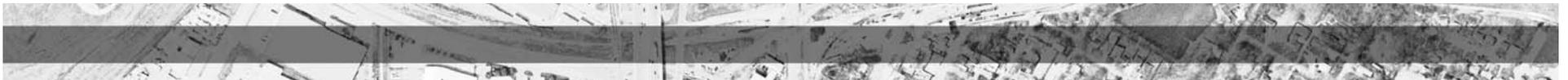
BNSF Station					
	SPACE REQUIREMENTS			SHARED	NOTES
	Units	Unit Area	SF		
<u>Boarding Platform</u>					
At-Grade Boarding Platform	1	11200	11200	N	400' platform length x 24' width (width varies)
<u>Vertical Circulation - End Loaded</u>					
Mezzanine	1	320	320		Includes ticketing
Elevator	1	100	100	Y	May be shared with Crosstown platform
Stair	1	1080	1080	N	12' Stair width to accommodate future escalators
Future Escalator	1	0	0	N	
<u>Vertical Circulation - Center Loaded</u>					
Mezzanine	1	880	880		Includes ticketing
Elevator	2	100	200	Y	May be shared with Crosstown platform
Stair	1	1080	1080	N	12' Stair width to accommodate future escalators
Future Escalator	1	0	0	N	
<u>Bus Boarding Area</u>					
Bus Bays	2	1500	3000	N	Centralized bus area preferred
Subtotal: Net Area			17860		
Circulation (Net: Usable)			0	0	
Subtotal: Usable Area			17,860	sf	

Operations Support Space

	SPACE REQUIREMENTS				NOTES
	Units	Unit Area	SF		
Administration/Maintenance					
Manager's Office	2	150	300	N	Facility Manager/ Assistant
Admin Office	1	110	110	N	
Reception Area	1	150	150	N	
File/Copy	1	80	80	N	
Storage	1	120	120	N	
Staff Restroom	2	48	96	N	
Break Area	1	200	200	N	
Conference Room	1	320	320	N	
Facility Maintenance Office	1	120	120	N	
Maintenance Storage	1	200	200	N	
Subtotal: Net Area			1,696		
Circulation (Net: Usable)		0.4	678		
Subtotal: Usable Area			2,374		
Gross Factor (15%)		0.15	356		
Total Gross Area			2,731 sf		

Common / Retail Areas

	SPACE REQUIREMENTS				NOTES
	Units	Unit Area	SF		
Public Areas					
Enclosed Waiting	1	6750	6750		Peak 15 minute AM patronage @ 15 SF per person Located in waiting area
Public Restrooms					
Men	1	800	800		
Women	1	800	800		
Vending	10	12	120		Located in waiting area
Retail	1	1200	1200		Located adjacent to waiting area
Police Storefront	1	1200	1200		
Visitors Center	1	400	400		Located in waiting area
Community Center	1	1200	1200		Exterior or lobby access
Staff Restrooms					
Men	1	200	200		
Women	1	200	200		
Subtotal: Net Area			12,870		
Circulation (Net: Usable)		0.25	3218		
Total: Usable Area			16,088 sf		
Gross Factor (15%)		0.15	2,413		
Total Gross Area			18,501 sf		



14. Preliminary Development Review

Overview of the City's Guiding Principles for TOD

The guiding principle document is designed to provide the project team with an overall view of the City of Carrollton's priorities and objectives which will guide the completion of the individual steps included in the 17 Step Pre-Development Process developed by SPPRE. After review of the information regarding the City of Carrollton's current status, SPPRE supplied questions to the City in order to ascertain the City's appetite for risk and level of desired involvement in the both the pre-development and development processes. The City's answers and comments were then incorporated into a "Guiding Principles Document" that the project team will refer to periodically in making major decisions and completing tasks, such as, structure public/private finance plans, recommend ownership and investment scenarios, etc.

Land Acquisition Strategy Report

SPPRE previously submitted a Draft Land Acquisition Strategy report (dated April 11, 2006) detailing initial recommendations on land parcels that the city should consider for purchase or control. The project team is currently waiting for the results of the market demand study and the finalized version of the Master Plan in order to provide our final report and recommendations in the Land Acquisition Strategy.

Development Review Phase 2 Scope of Work

SPPRE will begin work on Phase 2 once the Market Demand Study, Master Plan, and Land Acquisition Strategy are finalized. Phase 2 will be a very comprehensive and detailed phase that will begin with the preparation of the Phased Building Program. Based on the Building Program, SPPRE will

generate Total Development Budgets and a Developer ProForma for the Phase 1 TOD. This financial analysis will reveal whether the project is financially feasible using traditional private equity and debt, and equally important, the maximum amount of land lease payments paid to the City, yet meet the current requirements of the private equity and debt capital markets. We will then proceed to develop a Public/Private Finance Plan that will include the required private and public capital investments and the recommended finance instruments. We will also determine non-contingent land lease payments to the City and tax revenue generated and the amount of a bond that can be supported by this non-tax income and tax revenue. SPPRE will then prepare a Tax Revenue Analysis, a Tax Increment Analysis (for the TIRZ area), a Financial Sensitivity Analysis, and a Cash Flow Analysis. Finally

SPPRE will prepare a report on all assigned tasks in the Phase 2 scope of work dated September 19th 2005.

Guiding Principles:

The City of Carrollton has prioritized their objectives: the ranking of objectives will be used by SPPRE for reference and focus in all work product produced. The hierarchical ranking will be incorporated into all decisions and financial structures produced for the City. The order is as follows:

1. Maximize economic return and economic development
 - Contingent and Non-Contingent Income
 - Tax Revenue
 - Permanent and construction jobs
2. Optimize quality of the environment and development

- | | |
|--|---|
| <ul style="list-style-type: none"> 3. Achieve high standards of urban design and architecture 4. Maintain a high level of involvement in the Development Process 5. Maximize level of control 6. Maximize non-capital versus traditional capital investments 7. Maintain schedule, meet pre-determined deadlines. 8. Maximize financial and development safeguards 9. Minimize level of risk, such as: <ul style="list-style-type: none"> • Market risk • Construction risk • Interest rate risk • Ownership risk • Investment risk • Development risk | <ul style="list-style-type: none"> 10. Utilize Public/Public Partnerships, or Intergovernmental Agreements 11. Sensitivity to community outreach <p>The Guiding Principles document will be used as a reference tool throughout the pre-development process along with continual input from the City. Priorities may shift during the project leading to alterations in some of the items outlined above. We look forward to a successful working relationship.</p> |
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Guiding Principles

1. Maximize economic return and economic development
2. Optimize quality of the environment and development
3. Achieve high standards of urban design and architecture
4. Maintain a high Level of involvement in the development process.
5. Maximize level of control
6. Maximize non-capital versus traditional capital investments
7. Maintain schedule, meet pre-determined deadlines.
8. Maximize financial and development safeguards
9. Minimize level of risk
10. Utilize Public/Public partnerships, or intergovernmental agreements
11. Sensitivity to community outreach