



## TECHNICAL MEMORANDUM

**To:** DART/URS Cotton Belt Project Staff

**From:** URS/Stantec

**Date:** October 11, 2010 (revised 12/30/13)

**RE:** DRAFT – Existing Freight Operations along Cotton Belt Corridor between DFW Airport and Plano, TX

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### 1.0 INTRODUCTION

Through research of recent studies and reports, this technical memorandum is intended to document initial findings of the existing freight railroad operations and existing freight infrastructure that may be affected by the construction of the DART Regional Rail line from DFW Airport to the DART Red Line in the Plano/Richardson area. Most of the information was digested from the two reports listed in References (Section 7). Confirmation with freight companies as well as DART Railroad Management will be needed.

### 2.0 EXISTING CONDITIONS

The Cotton Belt Corridor is an existing east west freight rail corridor that is proposed to have passenger rail. The Cotton Belt Corridor right-of-way is a former Union Pacific Railroad (UP) line extending from north Fort Worth to Wylie, spanning approximately 60 miles. The right-of-way is currently owned by DART and has been designated a preserved corridor for passenger rail service. With variations, the right-of-way width is generally 100 feet. For the purposes of this analysis, freight operations will be examined from just north of DFW Airport to central Plano. This portion of the corridor passes through Collin, Dallas and Tarrant Counties including the cities of Grapevine, Coppell, Carrollton, Addison, Dallas, Richardson and Plano.

### 3.0 FREIGHT RAILROAD OPERATIONS

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 an important component of the planning effort as passenger rail service is developed in the corridor.

Four freight railroad companies operate within the corridor through agreements on tracks that are owned by DART. Various agreements control freight service activity within the Cotton Belt Corridor. The UP has track use rights on the entire corridor but operates no trains. The corridor can be viewed as having three service areas with three freight service providers. These freight service providers are: the Fort Worth and Western Railroad (FWWR), the Dallas, Garland and Northeastern Railroad (DGNO) and the Kansas City Southern (KCS).

Passenger service and freight service operations would coexist within various Cotton Belt Corridor segments. It is assumed one track would be dedicated for passenger service and a shared track would be maintained for both passenger and freight service. However, some sections may have single track to minimize impacts if service can be accommodated within the operating plan.

### **3.1 Fort Worth and Western Railroad (FWWR)**

The FWWR and the UP have track rights from Tower 60 in Fort Worth to the Downtown Carrollton Station. At this station, freight trains either continue on DART owned Cotton Belt tracks or turn northward on Burlington Northern Santa Fe Railway (BNSF) owned tracks. The UP does not operate freight service from Tower 60 to Downtown Carrollton Station.

### **3.2 Dallas, Garland and Northeastern Railroad (DGNO)**

The DGNO and the UP have track rights from Downtown Carrollton Station to Renner Junction in Richardson. The UP does not operate freight service from Downtown Carrollton Station to Renner Junction. The DGNO operates trains, has dispatching responsibilities and maintains the tracks. The DGNO currently dispatches approximately six trains weekly.

Since March 2007, freight service has not operated in the corridor between Knoll Trail and Renner Junction. Due to this inactivity, DART initiated a freight abandonment process in October 2009 with the Surface Transportation Board (STB). In January 2010, DART was granted approval from the STB to abandon freight service.

### **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 or management, although one forms part of a through route that is still connected to BNSF, the original owner.

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, DGNO has trackage rights on the Madill Subdivision (known as the “Madill Sub”) from Sherman to South Irving.

Cotton Belt is the second rail line passing through downtown Carrollton. The segment from Ft. Worth to Carrollton is operated by the FWWR. 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 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). This spur is referred to as the Dalnor Spur. 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.

A third rail route, referred as the “Katy,” (previously part of the UP) 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. 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 DGNO operations in Dallas is a yard located on the Trinity Rail Express line between Dallas and Ft. Worth known as Mockingbird Yard. Due to 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.

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. The need for the round trip, in addition to Mercer Yard “back-in/back-out” movements and the volume of BNSF trains on the Madill Subdivision at Carrollton, 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 the UP 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 attention. 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 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 online. 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 constructing the light rail extension from Dallas through Carrollton to Frankford Road. This line occupies 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 Downtown Carrollton Station occupies right-of-way that contains the curved connection which 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 was built from Mercer Yard in what is now the northeast quadrant of the freight network. This connection requires 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.

Once the DART LRT project is completed, the estimated daily DGNO car load traffic volumes (based on 2004 traffic levels) may change, as shown in Table 3.1. 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.

**Table 3.1**

<b>Average Daily Carload Volumes, DGNO Local Lines</b>	
Katy south of Multi-Modal Terminal	5
Katy north of Multi-Modal Terminal	17
Cotton Belt	32 Does not include rock trains
<b>Total</b>	<b>54 cars</b>

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

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**

One of the strongest areas of commodity growth after freight to truck transfers (intermodal), is construction aggregate (rock) in the sunbelt states. That type of traffic is currently passing through Carrollton. Nationally that commodity, measured by car-loads, is up 5.8%. 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.

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. 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 will 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 most immediate addition is likely to be Denton County Transportation Authority (DCTA) service between Denton and Carrollton. This 21-mile line is currently under construction. DCTA service would be provided on the former Katy Line, sharing it with local freight. DCTA will initially stop at the Trinity Mills Station with future plans to extend to the Downtown Carrollton Station.

The second and third additions would be the Cotton Belt Regional Rail and the potential commuter rail along the BNSF corridor (according to *NCTCOG Regional Transportation Plan Mobility 2030*).

### **3.3 Kansas City Southern (KCS)**

The KCS, DGNO and the UP have track rights from Renner Junction to Wylie. The UP does not operate freight service from Downtown Carrollton Station to Renner Junction. The KCS operates trains, has dispatching responsibilities and maintains the tracks. The KCS currently dispatches approximately two trains daily. Previously, KCS dispatched approximately 12 trains daily.

## **4.0 SPUR TRACKS**

## 5.0 TRACK CROSSINGS

## 6.0 IMPACTS TO FREIGHT TRAIN OPERATIONS

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. 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 Cotton Belt 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, regardless of whether the BNSF (Frisco) or Cotton Belt Regional rail 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. Secondly, maintaining the freight connection to the south of downtown Carrollton gets increasingly untenable. The number of tracks which must be crossed increases 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 Cotton Belt 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.

## 7.0 References

The following documents were referenced. Internet links are provided and, where applicable, contact information.

1. *Downtown Carrollton Rail Station Master Plan Phase I*. Prepared by Carter – Burgess for City of Carrollton. August 2006.

Link: <http://www.cityofcarrollton.com/Modules/ShowDocument.aspx?documentid=519>

2. *Cotton Belt Corridor: Conceptual Engineering and Funding Study*. North Central Texas Council of Governments. April 2010.

Link:

<http://www.nctcog.org/trans/spd/TransitRail/CtnBlt/Cotton%20Belt%20CE&FS%20042210.pdf>