



# **TRANSIT OPERATING PLANS, OPERATING STATISTICS AND O&M COSTS FOR NORTH I-25 DRAFT EIS PACKAGES**

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## 1.0 Introduction

This report documents the transit operating plans, transit operating statistics, and transit operating and maintenance (O&M) costs associated with the North I-25 packages as defined for the Draft Environmental Impact Statement (DEIS) analysis. The following summarizes the corridor transit elements of the two packages that were evaluated under the DEIS:

- **Package A (general purpose lanes, western commuter rail, and commuter bus on US 85 to DUS and DIA):** Commuter rail would operate within the BNSF right-of-way from Fort Collins to approximately SH 119, west on SH 119, south on County Road 7, then following the UP Boulder industrial lead rail alignment through the St. Vrain Junction, and connecting to the North Metro FasTracks line continuing to DUS. Commuter bus would operate in mixed traffic along US 85 from Greeley to DUS and Greeley to DIA.
- **Package B (express lanes and BRT on I-25):** BRT service would operate from Fort Collins to DUS/DIA and Greeley to DUS, using express lanes on I-25.

## 2.0 Transit Operating Plans

Transit operating plans refer to the definition of transit routes and service levels for each of the packages. The starting point for all operating plans is a “No-Action” transit network, described below. Packages then modify the No-Action transit network to introduce new corridor service(s). Feeder bus services are defined in order to provide transit access to the new corridor service(s). Modifications to existing bus routes are defined as applicable, to enhance connections to the new corridor service(s).

### 2.1 No-Action

The No-Action transit network is defined as existing plus committed transportation projects and programs through the forecast year 2030. The No-Action scenario incorporates RTD’s FasTracks plan, which includes rail transit service on the US 36 Corridor from Denver Union Station (DUS) to 1<sup>st</sup> & Terry in Longmont, and rapid transit service on the North Metro corridor from DUS to SH 7 in Thornton. RTD’s FasTracks bus network is also incorporated for the North I-25 No-Action transit network. Bus services provided by the Cities of Fort Collins (Transfort), Loveland (COLT), and Greeley (The Bus) are generally reflected at existing service. The South Transit Center in Fort Collins is assumed to be relocated to a site south of Harmony Road along US 287.

### 2.2 Package A

Package A provides an extension of the North Metro FasTracks rail line to Fort Collins. Package A also includes commuter bus service along US 85 from Greeley to DUS and from Greeley to DIA.

The North Metro FasTracks rail line from DUS to the terminus at SH 7 would be extended up along the Dent Line north to St. Vrain Junction. The alignment would follow the UP Boulder industrial lead rail alignment, County Road 7 north, SH 119 west, and tie into the BNSF corridor to Fort Collins. Stations would be assumed at I-25 and Weld County Road 8, Longmont at Sugar Mill, North Longmont, Berthoud, Downtown Loveland, North Loveland, South Fort Collins Transit Center, Colorado State University, and Fort Collins Downtown Transit Center. The full line from Fort Collins to Denver is assumed to operate at 30 minute peak headways and 60 minute base headways. Three route patterns provide service as follows:

- DUS to Fort Collins: 30 minute peak, 60 minute base
- DUS to 124<sup>th</sup>: 30 minute peak period service only
- DUS to SH 7: no peak period service, 60 minute base

US 85 commuter bus service from Greeley to DUS begins at the US 85 & D Street and travels south along US 85 in mixed traffic, providing stops at Downtown Greeley, South Greeley, Evans, Platteville, Fort Lupton, SH 7 (Brighton), Commerce City, and DUS. From Commerce City, the route follows 74<sup>th</sup> Avenue to access the I-25 HOV lane at 70<sup>th</sup> Avenue. Service frequency is defined at 30 minute peak, 60 minute base on weekdays and 60 minute service on weekends.

US 85 commuter bus service from Greeley to DIA begins at US 85 & D Street and travels south along US 85 in mixed traffic, providing stops at Downtown Greeley, South Greeley, Evans, Platteville, Fort Lupton, SH 7 (Brighton), and DIA. Service frequency is defined at 60 minutes all day, seven days a week.

Four feeder routes are defined in order to provide transit access from outlying communities to the new rail and commuter bus service:

- Greeley – Windsor – Fort Collins: New route begins at US 85 & D Street in Greeley and proceeds west along US 34, north on SH 257, west on Harmony Road, north on Timberline Road, west on SH 14 to the Fort Collins North Transit Center. Assumes 30 minute peak, 60 minute base service frequencies on weekdays and 60 minute service on weekends.
- Greeley – Loveland (US 34): New route begins at US 85 & D Street in Greeley and proceeds west along US 34 (business)/US 34 to west Loveland (US 34 at Wilson Avenue). Assumes 15 minute peak, 30 minute base service frequencies on weekdays and 30 minute service on weekends.
- Milliken – Johnstown - Berthoud: New route begins in Milliken, proceeds west on SH 60, south on I-25, west on SH 56 to the Berthoud commuter rail station. Assumes 60-minute peak, 60 minute base service on weekdays only.
- Firestone – Frederick - Erie: New route begins in Firestone, proceeds south on Colorado Ave through the towns of Frederick and Dacono, west on CR 8 to the town of Erie. A stop would be made at the CR 8 commuter rail station. Assumes 30 minute peak, 60-minute base service frequencies on weekdays only.

The transit route plan is illustrated in Figure 2-1. Stations and park and ride assumptions for the commuter bus corridor service are summarized in Appendix A, and a summary transit operating plan is provided in Appendix B.

Figure 2-1

# DEIS Package A: GPL + CR + CB85



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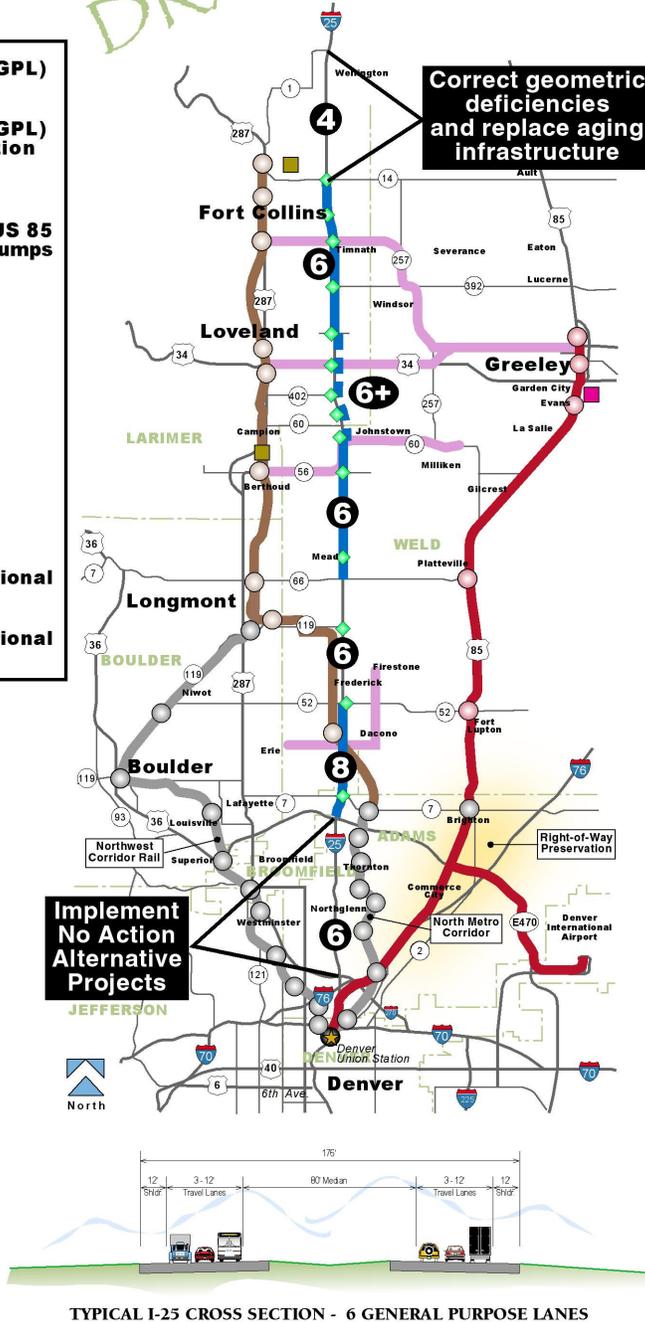
**LEGEND**

- 1 New General Purpose Lane (GPL) in Each Direction
- ▣ 1 New General Purpose Lane (GPL) + Auxiliary Lane in Each Direction
- Commuter Rail (CR)
- Commuter Bus (CB) Service in US 85 General Purpose Lanes and Que Jumps
- Feeder Bus Service
- ◆ Interchange Upgrades
- X Number of Lanes
- Commuter Bus Station / Stop
- Commuter Rail Station
- FasTracks Rail Line
- FasTracks Transit Station
- Potential Commuter Rail Operational & Maintenance Facility
- Potential Commuter Bus Operational & Maintenance Facility

**Congestion Management Measures include:**

- Enhanced carpool lot parking capacity and amenities
- Courtesy patrol (incident management) from SH 14 to SH 7
- Variable messaging signs at all transit stations
- Automated Vehicle Locaters on all transit vehicles - "next bus" technology
- Links to local bike and pedestrian systems at station areas
- Support for development of Transportation Management Organization (TMO)

- NOTE:**
- Select sections of I-25 would require auxiliary lanes and / or an additional through lane in addition to this 6-lane cross section.
  - Where widening is needed between SH 66 and SH 7, the median would be used.
  - Commuter Rail Service without a Longmont to North Metro connection will also be evaluated.



**NOT TO SCALE**

## 2.3 Package B

Package B provides Bus Rapid Transit (BRT) service along the I-25 corridor. Three BRT route patterns are proposed:

- Bus Rapid Transit (BRT) on I-25 corridor from Fort Collins to DUS (using express lanes);
- BRT on I-25 corridor from Fort Collins to DIA (using express lanes);
- BRT on I-25 corridor from Greeley to DUS (using express lanes);

The I-25 BRT service is a premium service that uses express lanes on I-25 and has BRT stops within the I-25 right-of-way. Because BRT stops do not require time-consuming route deviations, stops are relatively frequent along I-25.

The BRT service would begin at the Fort Collins South Transit Center, turn east on Harmony Road, then enter I-25 to proceed to Denver Union Station (DUS). BRT stops would be provided at South Fort Collins Transit Center, Harmony Road at Timberline, I-25 at Harmony Road, Windsor, Crossroads, Johnstown, Firestone, Frederick/Dacono, I-25 and SH7, I-25/Wagon Road pnR, and DUS. Service frequency is defined at 20 minute peak, 60 minute base on weekdays in the peak direction, and 60 minute service on weekends. In the reverse peak direction (from the DUS to Fort Collins), service would be provided at a 60-minute all-day service frequency.

The BRT service from Fort Collins to DIA would operate much like the service to DUS, but it would travel east on E-470 and terminate at DIA. BRT stops would be provided at the following locations: South Fort Collins Transit Center, Harmony Road at Timberline, I-25 at Harmony Road, Windsor, Crossroads, Johnstown, Firestone, Frederick/Dacono, I-25 and SH7, and DIA. Service frequency is defined at 60-minute all-day, seven days a week.

The BRT service from Greeley to DUS would begin at 8<sup>th</sup> & 8<sup>th</sup> in Greeley, proceed west on US 34, then enter I-25 to DUS. BRT stops would be provided at the Greeley Downtown Transfer Center, West Greeley, US 34 and SH 257, Johnstown, Firestone, Frederick/Dacono, I-25 and SH7, I-25/Wagon Road, and DUS. Service frequency is defined at 20 minute peak, 60 minute base on weekdays in the peak direction, and 60 minute service on weekends. In the reverse peak direction (from the DUS to Fort Collins), service would be provided at a 60-minute all-day service frequency.

Three feeder routes are defined in order to provide transit access from outlying communities to the BRT service:

- Windsor – Fort Collins: New route begins at US 34 and SH 257, travels north on SH 257, west on Harmony Road to the BRT station at I-25. Assumes 30 minute peak, 60 minute base service frequencies on weekdays and 60 minute service on weekends.
- Johnstown – Firestone: New route begins at the Johnstown BRT station at I-25 at SH 56/60 and proceeds west on SH 56, south on US 287, east on SH 119 to the I-25/SH 119 BRT station. Assumes 60-minute all-day service frequency on weekdays only.
- Fort Lupton – Niwot: New route begins in Fort Lupton at SH 52/US 85, travels west on SH 52 to Niwot, terminating at the US 36 FasTracks commuter rail station. Assumes 30-minute peak, 60 minute base service on weekdays only.

- Loveland – Crossroads: New route begins in Loveland, travels east on US 34 to the Crossroads BRT station. Assumes 30-minute peak, 60-minute base service on weekdays only.

In terms of modifications to local service, the Jitterbus would be extended to serve the Crossroads BRT station. A 30-minute peak period and 60-minute base period service frequency is proposed for both the Jitterbus and the proposed feeder route along US 34. This effectively provides a blended 15-minute peak and 30-minute base service frequency from the City of Loveland to the I-25/Crossroads BRT station.

The transit route plan is illustrated in Figure 2-2. Stations and park and ride assumptions for the commuter bus corridor service are summarized in Appendix A, and a summary transit operating plan is provided in Appendix B.

Figure 2-2

# DEIS Package B: TEL + BRT

NORTH I-25  
EIS  
information. cooperation. transportation.

**LEGEND**

- 1 Buffer-Separated Tolloed Express Lane (TEL) in Each Direction**
- 2 Barrier-Separated Tolloed Express Lanes (TEL) in Each Direction**
- Bus Rapid Transit (BRT) Route (Uses TELs on I-25)**
- Feeder Bus Service**
- Interchange Upgrades**
- X **Number of Lanes: General Purpose/Tolloed Express Lanes**
- Bus Rapid Transit Station**
- FasTracks Rail Line**
- FasTracks Transit Station**
- Potential Commuter Bus Operational & Maintenance Facility**

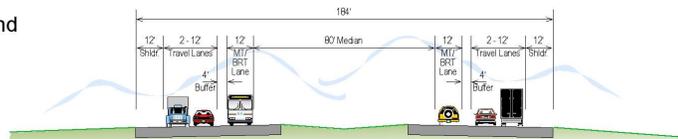
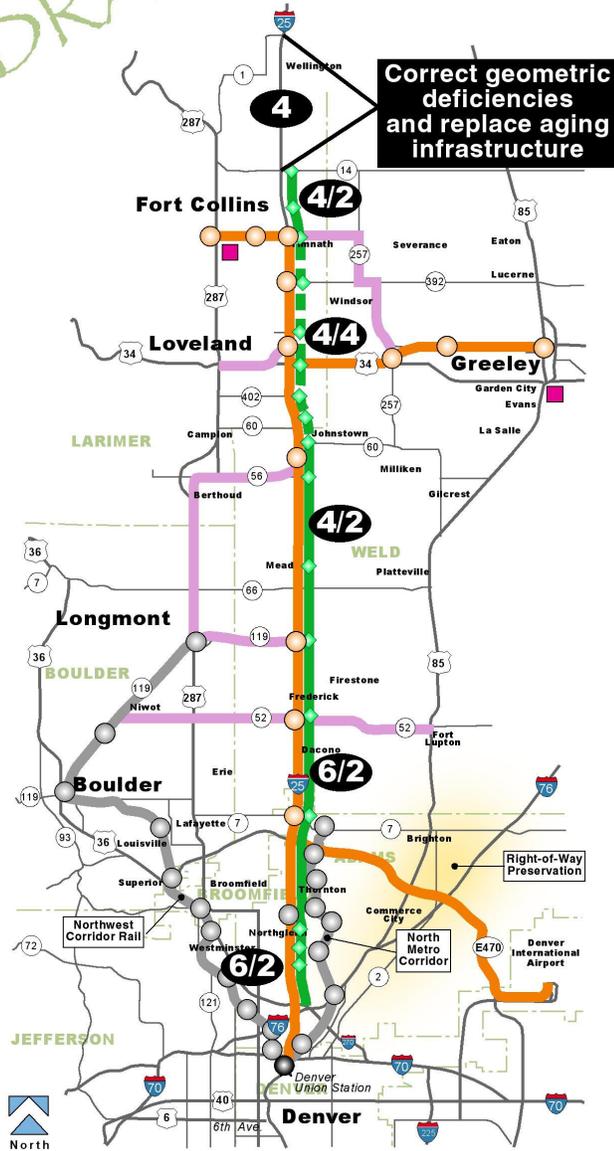
**Congestion Management Measures could include:**

- New local transit routes
- New express transit routes
- Enhanced carpool lot parking capacity and amenities
- Courtesy patrol (incident management) from SH 14 to SH 7
- Variable messaging signs at all transit stations
- Automated Vehicle Locaters on all transit vehicles - "next bus" technology
- Ramp metering and variable messaging signs at selected interchanges
- Signal coordination along US 34 and Harmony Road
- Continuous links to local bike and pedestrian systems
- Support for development of a Transportation Management Organization (TMO)

**NOTE:**

- A wider barrier and express lanes cross section is included between SH 60 and Harmony Road.
- BRT stations located within an expanded median area.
- Where widening is needed between SH 66 and SH 7, the median would be used.

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TYPICAL I-25 CROSS SECTION - BUFFERED SEPARATED TOLLED EXPRESS LANES



**NOT TO SCALE**

## 3.0 O&M Statistics

This section describes the process for developing operating statistics for the North I-25 DEIS packages. Operating statistics include peak/fleet vehicles, annual revenue vehicle miles, and annual revenue vehicle hours. Selected operating statistics are used as input variables for the O&M cost estimating described in the following chapter.

Bus operating statistics are developed through use of “operstat worksheets.” These worksheets use travel time, distance, and headway for each route defined under the packages in order to estimate peak and total fleet requirements, annual revenue vehicle hours, and annual revenue vehicle miles.

For existing bus routes that are modified under the packages, operating statistics are generated for the existing bus route and the modified bus route so that incremental changes to fleet requirements, vehicle hours and vehicle miles can be determined.

Rail operating statistics also are developed using “operstat worksheets.” The rail operstat worksheets use travel times, distances, headways, and train consist size to generate rail operating statistics such as peak/fleet vehicles, annual revenue train miles, car miles, train hours, and car hours. Since the rail alternatives are operating extensions of FasTracks corridors, a baseline FasTracks system is calculated and compared with the statistics which result from the rail extension in Packages A.

The following sections describe how each of the inputs (travel times, distances, headways, and train consist size) are developed.

### 3.1 Travel Times

If a transit route is expected to travel within prevailing highway conditions (such as a local bus, or commuter bus route where there is no dedicated lane), then travel times are generated automatically through the North I-25 EIS combined regional travel demand model. Bus speeds are considered a function of highway speeds, leading to a calculation of in-vehicle travel time. Dwell times are added to the in-vehicle travel times, based on the number of defined stops. The travel demand model reports separate travel times for each route (in-vehicle travel time and number of stops/dwell time) based on the direction of travel (e.g., northbound route versus southbound route) and further distinguished between peak and off-peak periods. For purposes of the operstat worksheet, a single total travel time from a representative package is used, averaging the peak total travel time in both directions. Therefore, for example, if a route takes a total of 30 minutes to travel in the westbound direction and 40 minutes to travel in the eastbound direction during the peak period, then the operstat worksheet will use the average of 35 minutes.

If a transit route has a separate operating environment from the highway (such as BRT operating in dedicated lanes, or rail lines operating in a dedicated right-of-way), then travel times are independently generated using a travel time worksheet which accounts for maximum speeds by segment (accounting for curves indicated in engineering drawings), distances between stations (as scaled from engineering drawings), and dwell time at stations. The travel time worksheet uses acceleration and deceleration functions specific to mode in order to come up with a travel time between stations, leading to an end-to-end travel time calculation. These travel times are then “hard-coded” in the North I-25 EIS combined regional travel demand model, rather than using a default run time as is used for buses in mixed traffic. If part of the route does run in mixed

traffic, as is the case with the BRT route on I-25 which penetrates Fort Collins and Greeley using local streets, then only the portion on I-25 is “hard-coded” with a separately-calculated run time. The portion using local streets uses the travel demand model’s automatically calculated travel time based on a function of highway speed and number of stops.

Travel time worksheets are included in Appendix C. Rail travel times are calculated for the new segments only; the travel time for the North Metro FasTracks route from DUS to SH 7 and the travel time for the US 36 FasTracks route from DUS to Longmont assume what is reflected in the FasTracks operating plan (October 2003).

### **3.2 Distances**

Engineering drawings were provided for the I-25 BRT and all study area rail corridors. In these cases, distances were determined from the engineering drawings. For the portion of the rail corridors that are FasTrack routes (North Metro and US 36), the distances reflected in the FasTracks operating plan (October 2003) were assumed.

For all other routes, the distances used in the operstat worksheets were averaged from the data provided (by route, by direction) from the travel demand model.

### **3.3 Headways**

Headways used in the operstat worksheets are based on the transit operating plan definition as described in Chapter 2.

### **3.4 Train Consists**

Of course, train consists only apply to rail alternatives and are not inputs for bus operstat worksheets. The train consists for the rail routes assume what was defined in the FasTracks operating plan (October 2003), since all rail alternatives are extensions of FasTracks corridors.

### **3.5 Summary of Operating Statistics**

Table 3-1 summarizes the estimated bus fleet requirements for each of the packages. Table 3-2 summarizes the estimated (incremental) annual revenue bus hours for each package, used as the basis for estimating bus operating and maintenance (O&M) costs. Other statistics can be found in Appendix D, which provides a full set of the bus operstat worksheets.

Table 3-3 provides the incremental rail fleet requirements for Packages A. Other incremental statistics such as annual train hours, car hours, train miles and car miles are provided in Appendix E, which provides a full set of the rail operstat worksheets.

Table 3-1

**NORTH I-25 EIS  
SUMMARY OF BUS FLEET REQUIREMENTS  
(incremental to No Action)**

<b>Bus Route</b>	<b>Pkg A</b>	<b>Pkg B</b>
<b>TRANSIT CORRIDOR BUS ROUTES</b>		
Bus on I-25: Ft Collins South TC - DUS	0	12
Bus on I-25: Ft Collins South TC - DIA	0	4
Bus on I-25: Greeley to DUS	0	11
Commuter bus on US 85, Greeley TC - DUS	8	0
Commuter bus on US 85, Greeley TC - DIA	4	0
	<b>12</b>	<b>27</b>
<b>MODIFIED LOCAL ROUTES</b>		
Fort Collins Rte 5	0	0
Fort Collins Rte 6	0	0
Fort Collins Rte 7	0	0
Jitterbus	0	2
	<b>0</b>	<b>2</b>
<b>FEEDER ROUTES</b>		
Greeley - Windsor - Ft Collins	7	0
Greeley - Loveland (US-34)	12	0
Milliken - Johnstown - Berthoud	2	0
Firestone - Frederick - Erie	5	0
Ft Lupton - Niwot (SH 52)	0	6
Windsor - Ft Collins	0	2
Loveland - Crossroads	0	2
Johnstown - SH 119	0	4
	<b>26</b>	<b>14</b>
<b>TOTAL BUS VEHICLES</b>	<b>38</b>	<b>43</b>

Table 3-2

**NORTH I-25 EIS  
SUMMARY OF ANNUAL BUS HOURS**

<b>Bus Route</b>	<b>MODEL ID</b>	<b>Pkg A</b>	<b>Pkg B</b>
<b>TRANSIT CORRIDOR BUS ROUTES</b>			
Bus on I-25: Ft Collins South TC - DUS	FCDUS	0	36,330
Bus on I-25: Ft Collins South TC - DIA	FCDIA	0	25,800
Bus on I-25: Greeley to DUS	GRLYDUS	0	24,440
Commuter bus on US 85, Greeley TC - DUS	DUSGRLY	31,430	0
Commuter bus on US 85, Greeley TC - DIA	GRLYDIA	20,140	0
<b>Subtotal Transit Corridor Annual Vehicle Hours</b>		<b>51,570</b>	<b>86,570</b>
<b>MODIFIED LOCAL ROUTES</b>			
Fort Collins Rte 5*	FC5	0	0
Fort Collins Rte 6*	FC6	0	0
Fort Collins Rte 7*	FC7	0	0
Jitterbus (Loveland)	Jitter	0	2,710
<b>Subtotal Modified Local Route Annual Vehicle Hours</b>		<b>0</b>	<b>2,710</b>
<b>FEEDER ROUTES</b>			
Greeley - Windsor - Ft Collins	GLYFC	21,090	0
Greeley - Loveland (US-34)	GRLYLVD	32,270	0
Milliken - Johnstown - Berthoud	MJBFDR	11,020	0
Firestone - Frederick - Erie	52FDR	14,070	0
Ft Lupton - Niwot (SH 52)	FTLPTNFDR	0	17,970
Windsor - Ft Collins	WNSRFDR	0	11,020
Loveland - Crossroads	LVNDFDR	0	7,020
Johnstown - SH 119		0	16,520
<b>Subtotal New Feeder Route Annual Vehicle Hours</b>		<b>78,450</b>	<b>52,530</b>
<b>TOTAL ANNUAL VEHICLE HOURS</b>		<b>130,020</b>	<b>141,810</b>

Table 3-3

**NORTH I-25 EIS  
RAIL FLEET REQUIREMENTS**

		Peak Pass. Cars	Total Pass. Cars	Peak Loco's	Total Loco's	Peak Headway	Peak Consist
<b>NO ACTION</b>							
US 36	DUS to Longmont (1st/Terry)	10	12	5	6	30	2
US 36	DUS to Boulder (Pearl/30th)	8	10	4	5	30	2
<b>Total US 36</b>		<b>18</b>	<b>22</b>	<b>9</b>	<b>11</b>		
North Metro	DUS to SH-7/160th	9	11	3	4	30	3
North Metro	DUS to 124th	6	7	2	2	30	3
<b>Total North Metro</b>		<b>15</b>	<b>18</b>	<b>5</b>	<b>6</b>		
<b>TOTAL US 36 AND NORTH METRO</b>		<b>33</b>	<b>40</b>	<b>14</b>	<b>17</b>		
<b>PACKAGE A</b>							
US 36	DUS to Sugar Mill	10	12	5	6	30	2
US 36	DUS to Longmont (1st/Terry)	0	0	0	0	n/a	n/a
US 36	DUS to Boulder (Pearl/30th)	8	10	4	5	30	2
<b>Total US 36</b>		<b>18</b>	<b>22</b>	<b>9</b>	<b>11</b>		
<b>Incremental US 36 to No Action</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		
North Metro	DUS to Fort Collins (Harmony Rd/I-25)	24	29	8	10	30	3
North Metro	DUS to SH-7/160th	0	0	0	0	n/a	n/a
North Metro	DUS to 124th	6	7	2	2	30	3
<b>Total North Metro</b>		<b>30</b>	<b>36</b>	<b>10</b>	<b>12</b>		
<b>Incremental North Metro to No Action</b>		<b>15</b>	<b>18</b>	<b>5</b>	<b>6</b>		
<b>TOTAL US 36 AND NORTH METRO</b>		<b>48</b>	<b>58</b>	<b>19</b>	<b>23</b>		
<b>INCREMENTAL TO NO ACTION</b>		<b>15</b>	<b>18</b>	<b>5</b>	<b>6</b>		

**Notes:**

**Blue values** (Total Vehicles of rail line to Fort Collins): Use as minimum capacity for sizing yard in Fort Collins.

**Green values** (Total Vehicles, Incremental to No Action for applicable rail line): Use to assess expansion impacts to existing Fastracks yard.

**Red values** (Total Vehicles, Incremental to No Action): Use to calculate capital cost of additional vehicles related to project.

**Vehicle Type:** Fastracks operating plan assumes 1 power/1trailer car for the US 36 line, 2 power/1trailer car for North Metro line:

## 4.0 O&M Cost Estimates

Annual O&M cost estimates were developed with three costing methods. For modifications to local bus service and for feeder bus services using conventional buses, an hourly service cost was applied based on a “blended” hourly rate of North Front Range operators. For premium bus service assumed for regional commuter or BRT services, a higher hourly service cost was applied, based on RTD’s hourly rate for bus services. For rail service, O&M costs are based on a commuter rail cost model, developed primarily with Virginia Railway Express (VRE)-reported cost data for 2003. All costs are expressed in 2005 dollars. The following descriptions discuss the methodology used to develop each cost method, followed by O&M cost results for each project package.

It should be noted that the process of determining how the North I-25 project will be administered is on-going. Several possible institutional arrangements are under consideration, including administration by one of the local transit service providers (with North I-25 service directly operated or contracted), expansion of the Regional Transportation District (RTD) to include all or parts of Weld and Larimer counties, or creation of a new transportation agency whose main purpose would be to operate this service. A decision regarding how the North I-25 service will be administered will be made as the packages of alternatives are refined.

### 4.1 O&M Cost Method for Local and Feeder Bus Service

All packages assume some degree of modifying existing local bus service as well as establishing new feeder bus services. To estimate the cost of local and feeder bus service, a representative cost per revenue vehicle hour was developed, using a weighted average of the three local operators serving this region (Fort Collins, Loveland and Greeley).

First, the cost per revenue vehicle hour was calculated for each of the three local operators in the study area, based on what was reported in the 2003 National Transit Database. Next, the calculated cost per revenue vehicle hour was escalated to 2005 dollars, based on applying a factor derived from the Bureau of Labor Statistics Consumer Price Index for the Western Urban Region (comparing the September 2005 index to the September 2003 index). Finally, each operator’s hourly costs were weighted according to their proportional share of revenue hours. Table 4-1 summarizes the data used to calculate the resulting weighted cost per revenue vehicle hour of \$68.85 (2005 dollars).

Table 4-1  
Summary of Cost per Revenue Vehicle Hour

Operator	2003 NTD Data			Cost per Revenue Vehicle Hour		
	Cost	Revenue Hours	% Hours	2003 dollars	2005 dollars <sup>1</sup>	Weighted <sup>2</sup>
<i>Western Urban Region</i>					106.4%	<b>\$68.85</b>
<b>Greeley, Colorado - The Bus</b>	\$1,402,513	26,736	26.3%	\$52.46	\$55.81	\$14.67
<b>Fort Collins, Colorado - Transfort</b>	\$4,859,544	60,648	59.6%	\$80.13	\$85.24	\$50.82
<b>Loveland, Colorado - COLT</b>	\$320,938	14,335	14.1%	\$22.39	\$23.82	\$3.36

NOTES:

1. Escalation to 2005 dollars based on factor of September 2005 to September 2003 Bureau of Labor Statistics Consumer Price Index for Western Urban Region.
2. 2005 Weighted Average based on percentage of hours.

This cost per revenue vehicle hour was applied to the estimated service hours associated with the new feeder routes and incremental service hours to modifying existing routes. The estimation of service hours are discussed in the previous chapter; operating statistic worksheets are presented in Appendix A. For modified local routes, incremental operating statistics were calculated based on comparing the modified routes with the No-Action (existing) routes.

## 4.2 O&M Cost Method for Premium Bus Service

For commuter or BRT routes that are proposed to provide corridor service, it is assumed that a more premium bus service is desired. To account for some type of upgrade in local service delivery, a higher cost per revenue vehicle hour was used. For purposes of this exercise, the RTD hourly service cost of \$84.84 in 2003 dollars (based on RTD's 2003 NTD data) was inflated to 2005 dollars using the same escalation method described in Section 4.1, leading to an hourly service cost of \$90.64.

This cost per revenue vehicle hour was applied to the estimated service hours associated with the new corridor routes. The estimation of service hours are discussed in the previous chapter; operating statistic worksheets are presented in Appendix A.

## 4.3 O&M Cost Method for Rail Service

Specific operating arrangements for North I-25 commuter rail service are undetermined at this time. It is anticipated that coordination and cost-sharing arrangements will be needed with RTD, for the proposed commuter rail service plan reflects integration of North I-25 commuter rail service with RTD's proposed North Metro service. For purposes of this DEIS, an oversight agency has been assumed that is responsible for traditional commuter rail service from Ft. Collins to Denver Union Station (DUS), with train operations, equipment maintenance and track maintenance contracted out. Because of the integrated service plan with RTD's North Metro service, it was necessary to use these same operating assumptions for the No-Action rail plan as well, in order to get an incremental O&M cost estimate (even though RTD commuter rail operating arrangements are likely to differ). Specific operating assumptions that have been used in the development of North I-25 commuter rail O&M costs are based on cost experiences from several existing commuter rail operators and as follows:

### Oversight Transit Agency Expenses

Oversight agency expenses are anticipated to be as follows:

- *Risk Management and General Liability* – Operation of commuter rail service will trigger the need for additional insurance coverage. Existing insurance cost information for San Diego's Coaster commuter rail line was used to estimate an insurance cost for this project. It has been assumed that 50% of insurance costs are fixed, and 50% is driven by a combination of train-hours (to reflect the level of service provided) and route-miles (to reflect the physical length of service).
- *Vehicle Maintenance* – It is assumed that the oversight transit agency is responsible for the purchase of diesel fuel. This expense item's cost has been estimated by using a fuel consumption rate of 1.5 gallons per train-mile (fuel consumption rate for a F59-PH locomotive with up to 5 passenger cars), annual revenue train-miles with a 10%

contingency, and a cost of \$2.563 per gallon (October 2006 average diesel fuel cost for the Rocky Mountain region).

- *Facility Maintenance* – An additional mechanic for every 10 stations is assumed for station/maintenance repair. Costs are included for contracted station cleaning services, materials and utilities. Those costs are based on VRE budget information.
- *Finance/Revenue Collection/Money Counting* – Staffing has been assumed for financial tasks. Money counting security and costs for materials are based on LRT cost experiences. Ticket vending machine (TVM) maintenance costs are based on New Mexico’s Road Runner budget information.
- *Purchasing* – One full time employee equivalent (FTE) has been assumed for purchasing.
- *Marketing* – Staffing is assumed for marketing, and related services, based on cost experiences for New Mexico’s Road Runner.
- *Safety/Police/Security* – An additional FTE is assumed for a Safety Specialist. Police staffing is also assumed, based on annual revenue train-miles. Security service has been assumed for 24 hour/7 days per week security at commuter rail yards.

#### Railroad Service Provider Costs

Costs for train operations, equipment maintenance, and track maintenance are based cost experiences for the Virginia Railway Express (VRE). Railroad-related costs and operating characteristics used to estimate those costs are as follows:

- *Train Operations* – Annual Revenue Train-Hours
- *Maintenance of Equipment* – Peak Locomotives and Peak Passenger Cars
- *Maintenance Materials & Handling* – Peak Locomotives and Peak Passenger Cars
- *Other Costs* – Percentage of Above-Noted Cost Items
- *Track Maintenance* – Route-Miles and Annual Revenue Car-Miles

#### North I-25 Commuter Rail Cost Estimates

Overall, the estimated annual O&M cost for North I-25 commuter rail service in DEIS Package A is estimated to be \$28.22 million (in 2005 dollars) more than the No-Action Alternative. Once again, it is important to keep in mind that this cost model was used to estimate a “base” cost for the No-Action commuter rail service plan, and that operating arrangements for the No-Action rail plan will differ from assumptions that are reflected in this cost model. However, use of this model for both the No-Action and Package A Alternatives was necessary to obtain an incremental cost difference. Incremental costs for Package A commuter rail service to Fort Collins are as presented in Table 4-2. Cost estimate worksheets for the No-Action Alternative and Package A are provided in Appendix F.

Table 4-2  
Incremental O&M Cost for Package A Commuter Rail

Cost Item	Incremental Cost
Casualty & Liability	\$1,360,200
Vehicle Maintenance (Diesel Fuel)	\$3,428,500
Facility Maintenance	\$735,400
Finance/Rev. Collection/Money Counting	\$365,200
Purchasing	
Marketing/Customer Service	\$60,000
Safety/Police/Security	\$368,800
RR Operations/Equip. Maint./Track Maint.	
Train Operations	\$9,385,400
Equip. Maint./Materials Handling	\$1,252,500
Other	\$6,840,900
Track Maintenance	\$4,426,100
<b>Total Incremental Cost</b>	<b>\$28,223,000</b>

#### 4.4 O&M Cost Results

Resulting O&M cost estimates are presented in Table 4-3. A breakdown of O&M costs by bus route is presented in Table 4-4. All cost estimates are in 2005 dollars. It is important to note that the statistics and costs presented below are based on operating characteristics defined for the North I-25 packages, and are not the same as those previously defined in the FasTracks systems planning effort.

**Table 4-3**  
**Summary of O&M Cost Estimates (Over No-Action Alternative)**  
**for North I-25 Packages (in 2005 Dollars)**

<b>Service</b>		<b>Package A</b>	<b>Package B</b>
<b>Local Route Service</b>			
	Peak Buses	22	14
	Fleet Buses	26	17
	Annual Revenue Bus Hours	53,360	30,150
	Annual Revenue Bus Miles	1,115,400	735,000
	<b>Standard Bus O&amp;M Cost</b>	<b>\$5,401,283</b>	<b>\$3,803,274</b>
<b>Premium Corridor Service</b>			
	Peak Buses	10	22
	Fleet Buses	12	26
	Annual Revenue Bus Hours	51,570	86,570
	Annual Revenue Bus Miles	1,675,500	2,710,900
	<b>Premium Bus O&amp;M Cost</b>	<b>\$4,674,069</b>	<b>\$8,378,308</b>
<b>Rail Service</b>			
	Peak Locomotives	5	0
	Fleet Locomotives	3	0
	Peak Passenger Cars	15	0
	Fleet Passenger Cars	18	0
	Annual Revenue Train Hours	23,370	0
	Annual Revenue Train Miles	1,981,000	0
	<b>Commuter Rail O&amp;M Cost</b>	<b>\$28,223,000</b>	<b>\$0</b>
<b>Total Package Add'l. O&amp;M Cost</b>		<b>\$38,298,352</b>	<b>\$12,181,582</b>

**Table 4-4  
O&M Cost Breakdown by Bus Route  
for North I-25 Packages (in 2005 Dollars)**

<b>Bus Route</b>	<b>Pkg A</b>	<b>Pkg B</b>
<b>TRANSIT CORRIDOR BUS ROUTES</b>		
Bus on I-25: Ft Collins South TC - DUS	\$0	\$3,292,785
Bus on I-25: Ft Collins South TC - DIA	\$0	\$2,338,394
Bus on I-25: Greeley to DUS	\$0	\$2,215,130
Commuter bus on US 85, Greeley TC - DUS	\$2,848,671	\$0
Commuter bus on US 85, Greeley TC - DIA	\$1,825,397	\$0
	<b>\$4,674,069</b>	<b>\$8,378,308</b>
<b>MODIFIED LOCAL ROUTES</b>		
Fort Collins Rte 5*	\$0	\$0
Fort Collins Rte 6*	\$0	\$0
Fort Collins Rte 7*	\$0	\$0
Jitterbus (Loveland)	\$0	\$186,584
	<b>\$0</b>	<b>\$186,584</b>
<b>FEEDER ROUTES</b>		
Greeley - Windsor - Ft Collins	\$1,452,047	\$0
Greeley - Loveland (US-34)	\$2,221,790	\$0
Milliken - Johnstown - Berthoud	\$758,727	\$0
Firestone - Frederick - Erie	\$968,720	\$0
Ft Lupton - Niwot (SH 52)	\$0	\$1,237,235
Windsor - Ft Collins	\$0	\$758,727
Loveland - Crossroads	\$0	\$483,327
Johnstown - SH 119	\$0	\$1,137,402
	<b>\$5,401,283</b>	<b>\$3,616,691</b>
<b>TOTAL ANNUAL BUS O&amp;M COSTS</b>	<b>\$10,075,351</b>	<b>\$12,181,582</b>

**APPENDIX A  
STATION DETAIL  
BY CORRIDOR ROUTE**

**NORTH I-25 EIS  
DEIS ALTERNATIVES - STATION DETAIL**

<b>Stations</b>	<b>Park and ride</b>
<b>Commuter Bus on US-85: Greeley-DUS/DIA</b>	
<i>(Package A)</i>	
D Street	Y
21st Avenue	N
8th Avenue	N
Greeley South Site G	Y
Evans	Y
Platteville	Y
Ft. Lupton	Y
<b>North Metro extended to Fort Collins via SH-119</b>	
<i>(Package A)</i>	
Fort Collins Downtown	Y
CSU	N
Fort Collins Transit Center	Y
Loveland - 29th Street	Y
Loveland - 4th Street	N
Berthoud - SH-56	Y
Longmont - SH-66	Y
Sugar Mill	Y
County Road 8	Y
<b>Bus Rapid Transit (BRT) on I-25: Ft Collins and Greeley-DUS</b>	
<i>(Package B)</i>	
Fort Collins Transit Center	Y
Timberline	Y
Harmony Road	Y
SH-392	Y
Crossroads	Y
SH-56	Y
SH-119	Y
SH-52	Y
SH-7	Y

**APPENDIX B  
TRANSIT OPERATIONS PLAN SUMMARY**

**NORTH I-25 DEIS  
DEIS ALTERNATIVES - SUMMARY OF TRANSIT OPERATING PLAN**

	<b>No-Action</b>	<b>Package A</b>	<b>Package B</b>
<b>TRANSIT CORRIDOR IMPROVEMENTS</b>			
Bus on I-25: Ft Collins South - DUS	NA	NA	20, 60 in peak direction and 60, 60 in reverse peak direction; BRT in managed lanes
Bus on I-25: Ft Collins South - DIA	NA	NA	60, 60; BRT in managed lanes
Bus on I-25: Greeley TC - DUS	NA	NA	20, 60 in peak direction and 60, 60 in reverse peak direction; BRT in managed lanes
Commuter bus on US 85, Greeley TC - DUS	NA	30, 60	NA
Commuter bus on US 85, Greeley TC - DIA	NA	60, 60	NA
North Metro, 124th - DUS	30, 0	30, 0	same as No Build
North Metro, SH 7 - DUS	30, 30	0, 60	same as No Build
North Metro extended to Longmont (via I-25 and SH 119) or Ft Collins (via BNSF)	NA	30, 60; from SH 7, route extends to Longmont via CR 8 and SH 119	NA
US 36 Commuter rail, 1st/Terry to DUS	30, 30	0, 60	same as No Build
US 36 Commuter rail, Pearl/30th to DUS	30, 0	30, 0	same as No Build
US 36 Commuter rail, Sugar Mill to DUS	NA	30, 60	same as No Build
<b>SUPPORTING BUS NETWORK</b>			
Foxtrot (Fort Collins to Loveland)	60, 60 (relocated Fort Collins South Transit Ctr to Loveland)	same as No Build	same as No Build
Fort Collins Rte 1	20, 20; relocate South Transit Ctr to south of Harmony	same as No Build	same as No Build
Fort Collins Rte 5	60, 60; relocate South Transit Ctr to south of Harmony	same as No Build	same as No Build
Fort Collins Rte 6	60, 60; relocate South Transit Ctr to south of Harmony	same as No Build	same as No Build

Fort Collins Rte 7	30, 30; relocate South Transit Ctr to south of Harmony	same as No Build	same as No Build
Jitterbus	60, 60	same as No Build	30, 60; extend to serve Crossroads BRT station
Loveland - Crossroads BRT feeder	NA	NA	30, 60; begin in Loveland, east on US 34 to Crossroads BRT station
Greeley - Windsor - Ft Collins	NA	30, 60; from Greeley TC Hwy 34 - Hwy 257 - Hwy 392/32 - Hwy 287 - Ft Collins South	NA
Greeley - Loveland (US-34)	NA	15, 30; from Greeley TC, west on US 34 to Loveland CRT station	NA
Milliken - Johnstown - Berthoud	NA	60, 60; begin rte in Milliken west on CR 60 through Johnstown, south on I-25 frontage road, west on SH 56 to the Berthoud CRT station	NA
Firestone - Frederick - Erie	NA	30, 60; begin rte in Dacono (CR 13/Rte 52), north on CR 13, west on SH 119 to Longmont commuter rail stn	NA
Windsor - Ft Collins	NA	NA	60, 60; begin rte at US 34/Hwy 257, north on Hwy 257, west on Harmony Rd to the BRT station
Johnstown - Firestone	NA	NA	60, 60; begin rte at Johnstown BRT station, west on SH 56, south on US 287, east on SH 119 to the BRT station
Ft Lupton - Niwot	NA	NA	30, 60; begin rte at SH 52/US 85, west on SH 52, terminating at the Niwot CRT station

## **APPENDIX C TRAVEL TIME WORKSHEETS**

**DENVER I-25 NORTH EIS**  
**DMU SOUTHBOUND TRAVEL TIME ESTIMATES**  
*Fort Collins to DUS via BNSF - North Metro*  
**DEIS Package A**

Station	Max Spd - (mph)	Distance (miles)		Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
		Incr.	Total				
<b>Fort Collins</b>			<b>0.00</b>			<b>0:00:00</b>	<b>0:00:00</b>
	65	1.23		0:02:15	0:00:00		
<b>CSU</b>			<b>1.23</b>			<b>0:01:00</b>	<b>0:03:15</b>
	75	3.75		0:04:28	0:00:00		
<b>Harmony</b>			<b>4.98</b>			<b>0:01:00</b>	<b>0:08:43</b>
	50	0.44		0:01:01	0:00:00		
Start of Curve 1			<b>5.42</b>			<b>0:00:00</b>	<b>0:09:44</b>
	50	0.17		0:00:13	0:00:00		
End of Curve 1			<b>5.59</b>			<b>0:00:00</b>	<b>0:09:57</b>
	75	1.07		0:01:21	0:00:00		
Start of Curve 2			<b>6.66</b>			<b>0:00:00</b>	<b>0:11:18</b>
	75	0.20		0:00:10	0:00:00		
End of Curve 2			<b>6.87</b>			<b>0:00:00</b>	<b>0:11:28</b>
	75	0.85		0:00:41	0:00:00		
Start of Curve 3			<b>7.72</b>			<b>0:00:00</b>	<b>0:12:09</b>
	75	0.19		0:00:09	0:00:00		
End of Curve 3			<b>7.91</b>			<b>0:00:00</b>	<b>0:12:18</b>
	75	1.15		0:00:56	0:00:00		
Start of Curve 4			<b>9.06</b>			<b>0:00:00</b>	<b>0:13:14</b>
	65	0.25		0:00:14	0:00:00		
End of Curve 4			<b>9.31</b>			<b>0:00:00</b>	<b>0:13:28</b>
	65	0.43		0:00:24	0:00:00		
Start of Curve 5			<b>9.74</b>			<b>0:00:00</b>	<b>0:13:52</b>
	50	0.19		0:00:14	0:00:00		
End of Curve 5			<b>9.92</b>			<b>0:00:00</b>	<b>0:14:06</b>
	70	2.01		0:02:22	0:00:00		
<b>Loveland - 29th St</b>			<b>11.93</b>			<b>0:01:00</b>	<b>0:17:28</b>
	70	1.80		0:02:49	0:00:00		
<b>Loveland - US 34</b>			<b>13.73</b>			<b>0:01:00</b>	<b>0:21:17</b>
	35	0.19		0:00:35	0:00:00		
Start of Curve 1			<b>13.92</b>			<b>0:00:00</b>	<b>0:21:52</b>
	45	0.18		0:00:20	0:00:00		
End of Curve 1			<b>14.10</b>			<b>0:00:00</b>	<b>0:22:12</b>
	45	0.40		0:00:32	0:00:00		
Start of Curve 2			<b>14.51</b>			<b>0:00:00</b>	<b>0:22:44</b>
	45	0.20		0:00:16	0:00:00		
End of Curve 2			<b>14.70</b>			<b>0:00:00</b>	<b>0:23:00</b>
	45	0.39		0:00:33	0:00:00		
Start of Curve 3			<b>15.09</b>			<b>0:00:00</b>	<b>0:23:33</b>
	30	0.28		0:00:34	0:00:00		
End of Curve 3			<b>15.38</b>			<b>0:00:00</b>	<b>0:24:07</b>
	30	0.02		0:00:03	0:00:00		
Start of Curve 4			<b>15.40</b>			<b>0:00:00</b>	<b>0:24:10</b>
	30	0.35		0:00:42	0:00:00		
End of Curve 4			<b>15.75</b>			<b>0:00:00</b>	<b>0:24:52</b>
	30	0.04		0:00:05	0:00:00		
Start of Curve 5			<b>15.79</b>			<b>0:00:00</b>	<b>0:24:57</b>
	30	0.24		0:00:29	0:00:00		
End of Curve 5			<b>16.03</b>			<b>0:00:00</b>	<b>0:25:26</b>
	75	4.04		0:04:22	0:00:00		

<b>Berthoud - SH 56</b>			<b>20.07</b>			<b>0:01:00</b>	<b>0:30:48</b>
Start of Curve 1	50	0.78	20.86	0:01:26	0:00:00	0:00:00	0:32:14
End of Curve 1	50	0.51	21.36	0:00:36	0:00:00	0:00:00	0:32:50
Start of Curve 2	55	0.33	21.69	0:00:25	0:00:00	0:00:00	0:33:15
End of Curve 2	55	0.14	21.83	0:00:09	0:00:00	0:00:00	0:33:24
Start of Curve 3	55	0.02	21.85	0:00:02	0:00:00	0:00:00	0:33:26
End of Curve 3	60	0.18	22.04	0:00:15	0:00:00	0:00:00	0:33:41
Start of Curve 4	65	0.70	22.74	0:00:43	0:00:00	0:00:00	0:34:24
End of Curve 4	60	0.13	22.87	0:00:08	0:00:00	0:00:00	0:34:32
Start of Curve 5	60	0.04	22.91	0:00:02	0:00:00	0:00:00	0:34:34
End of Curve 5	60	0.14	23.05	0:00:09	0:00:00	0:00:00	0:34:43
Start of Curve 6	60	0.11	23.17	0:00:07	0:00:00	0:00:00	0:34:50
End of Curve 6	60	0.25	23.42	0:00:15	0:00:00	0:00:00	0:35:05
Start of Curve 7	60	1.36	24.78	0:01:23	0:00:00	0:00:00	0:36:28
End of Curve 7	45	0.19	24.97	0:00:15	0:00:00	0:00:00	0:36:43
Start of Curve 8	50	0.44	25.41	0:00:35	0:00:00	0:00:00	0:37:18
End of Curve 8	40	0.26	25.67	0:00:23	0:00:00	0:00:00	0:37:41
	75	1.80		0:02:25	0:00:00		
<b>Longmont - SH 66</b>			<b>27.46</b>			<b>0:01:00</b>	<b>0:41:06</b>
Start of Curve 1	40	1.91	29.37	0:03:12	0:00:00	0:00:00	0:44:18
End of Curve 1	35	0.26	29.63	0:00:27	0:00:00	0:00:00	0:44:45
Start of Curve 2	35	0.01	29.64	0:00:01	0:00:00	0:00:00	0:44:46
End of Curve 2	35	0.19	29.84	0:00:20	0:00:00	0:00:00	0:45:06
Start of Curve 3	35	0.53	30.36	0:00:54	0:00:00	0:00:00	0:46:00
End of Curve 3	35	0.18	30.54	0:00:19	0:00:00	0:00:00	0:46:19
Start of Curve 4	35	0.01	30.56	0:00:01	0:00:00	0:00:00	0:46:20
End of Curve 4	35	0.06	30.61	0:00:06	0:00:00	0:00:00	0:46:26
Start of Curve 5	35	0.07	30.68	0:00:07	0:00:00	0:00:00	0:46:33
End of Curve 5	35	0.11	30.80	0:00:12	0:00:00	0:00:00	0:46:45
Start of Curve 6	35	0.22	31.01	0:00:22	0:00:00	0:00:00	0:47:07
End of Curve 6	35	0.06	31.07	0:00:06	0:00:00	0:00:00	0:47:13
	35	0.03		0:00:04	0:00:00		

Start of Curve 7			31.11			0:00:00	0:47:17
End of Curve 7	35	0.05	31.16	0:00:06	0:00:00	0:00:00	0:47:23
Start of Curve 8	35	0.04	31.20	0:00:04	0:00:00	0:00:00	0:47:27
End of Curve 8	35	0.10	31.30	0:00:10	0:00:00	0:00:00	0:47:37
	25	0.05		0:00:13	0:00:00		
<b>Sugar Mill</b>			<b>31.34</b>			<b>0:01:00</b>	<b>0:48:50</b>
<b>TOTAL</b>			<b>31.34</b>	<b>0:41:50</b>	<b>0:00:00</b>	<b>0:07:00</b>	<b>0:48:50</b>
	<b>Avg Stn Spacing =</b>	<b>4.48 miles</b>				<b>Avg Speed =</b>	<b>38.51</b>

Notes:

Distances and curve restrictions from plan drawings provided by Carter Burgess, July 2006.

Some design curves from drawings not noted since operating speeds dictated by acceleration/deceleration rather than design speed.

**North Metro Line extension to Longmont via SH 119  
DEIS Package A**

Station	Max Spd . (mph)	Distance (miles) Incr.	Total	Run Time (hr:min:sec)	Delay Time (hr:min:sec)	Dwell Time (hr:min:sec)	Total Time (hr:min:sec)
<b>Longmont (1st &amp; Terry)</b>			<b>0.00</b>			<b>0:00:00</b>	<b>0:00:00</b>
Start of Curve 1	45	0.46	0.46	0:01:01	0:00:00	0:00:00	0:01:01
End of Curve 3	35	0.32	0.78	0:00:33	0:00:00	0:00:00	0:01:34
Start of Curve 4	35	0.18	0.95	0:00:18	0:00:00	0:00:00	0:01:52
End of Curve 4	35	0.10	1.05	0:00:10	0:00:00	0:00:00	0:02:02
Start of Curve 5	35	0.13	1.18	0:00:13	0:00:00	0:00:00	0:02:15
End of Curve 5	35	0.10	1.27	0:00:14	0:00:00	0:00:00	0:02:29
<b>Sugar Mill</b>			<b>1.28</b>			<b>0:01:00</b>	<b>0:03:35</b>
Start of Curve 1	55	0.80	2.09	0:01:30	0:00:00	0:00:00	0:05:05
End of Curve 1	35	0.10	2.19	0:00:10	0:00:00	0:00:00	0:05:15
Start of Curve 2	35	0.03	2.22	0:00:03	0:00:00	0:00:00	0:05:18
End of Curve 2	35	0.10	2.32	0:00:10	0:00:00	0:00:00	0:05:28
Start of Curve 3	75	1.31	3.63	0:01:48	0:00:00	0:00:00	0:07:16
End of Curve 3	75	0.21	3.84	0:00:10	0:00:00	0:00:00	0:07:26
Start of Curve 4	75	0.02	3.86	0:00:01	0:00:00	0:00:00	0:07:27
End of Curve 4	75	0.21	4.07	0:00:10	0:00:00	0:00:00	0:07:37
Start of Curve 5	75	1.26	5.33	0:01:03	0:00:00	0:00:00	0:08:40
End of Curve 5	45	0.51	5.84	0:00:41	0:00:00	0:00:00	0:09:21
Start of Curve 6	75	6.35	12.20	0:05:43	0:00:00	0:00:00	0:15:04
End of Curve 6	45	0.32	12.52	0:00:26	0:00:00	0:00:00	0:15:30
	65	0.91		0:01:26	0:00:00		

<b>County Rd 8 / I-25</b>		<b>13.43</b>		<b>0:01:00</b>	<b>0:17:56</b>		
Start of Curve 9	50	0.42	13.85	0:01:00	0:00:00	0:00:00	0:18:56
End of Curve 9	60	0.40	14.25	0:00:33	0:00:00	0:00:00	0:19:29
Start of Curve 10	60	0.06	14.31	0:00:04	0:00:00	0:00:00	0:19:33
End of Curve 10	60	0.25	14.57	0:00:15	0:00:00	0:00:00	0:19:48
Start of Curve 11	70	0.60	15.17	0:00:41	0:00:00	0:00:00	0:20:29
End of Curve 11	70	0.24	15.41	0:00:12	0:00:00	0:00:00	0:20:41
Start of Curve 12	70	0.14	15.55	0:00:07	0:00:00	0:00:00	0:20:48
End of Curve 12	75	0.46	16.01	0:00:28	0:00:00	0:00:00	0:21:16
Start of Curve 13	75	1.32	17.33	0:01:03	0:00:00	0:00:00	0:22:19
End of Curve 13	75	0.28	17.62	0:00:14	0:00:00	0:00:00	0:22:33
Start of Curve 14	75	1.06	18.68	0:00:57	0:00:00	0:00:00	0:23:30
End of Curve 14	75	0.46	19.14	0:00:26	0:00:00	0:00:00	0:23:56
	40	0.13		0:00:22	0:00:00		
<b>SH 7/Dent</b>		<b>19.27</b>		<b>0:01:00</b>		<b>0:25:18</b>	
<b>TOTAL</b>		<b>19.27</b>		<b>0:22:18</b>	<b>0:00:00</b>	<b>0:03:00</b>	<b>0:25:18</b>
<b>Avg Stn Spacing =</b>		<b>6.42 miles</b>				<b>Avg Speed =</b>	<b>45.70</b>

Notes:

Distances and curve restrictions from plan drawings provided by Carter Burgess, July 2006.

Total travel time from SH 7 to DUS provided by Carter Burgess based on modeled times.

## **APPENDIX D BUS OPERSTAT WORKSHEETS**

**North I-25 EIS  
BUS OPERATING PLANS  
LOCAL CORRIDOR ROUTES - DEIS NO-ACTION**

Route	Run Time (minutes)	Distance (miles)	Headway			Peak Veh.	Daily Rev.		Annual Rev.	
			Day	Peak	Base		Veh Miles	Veh Hrs	Veh Miles	Veh Hrs
Foxtrot exist <i>ave mph 20.08</i>	30.4	10.2	M-F	60.0	60.0	2.00	264.2	26.0	67,100	6,600
			Sat	n/a	60.0		264.7	26.1	13,500	1,330
			Sun	n/a	n/a		0.0	0.0	0	0
<hr/>										
7,930										
Transfort 5 modified South Transit Center <i>ave mph 13.96</i>	23.3	5.4	M-F	60.0	60.0	1.00	141.3	13.0	35,900	3,300
			Sat	n/a	60.0		141.2	12.9	7,200	660
			Sun	n/a	n/a		0.0	0.0	0	0
<hr/>										
3,960										
Transfort 6 modified South Transit Center <i>ave mph 15.82</i>	26.2	6.9	M-F	60.0	60.0	1.00	179.5	13.0	45,600	3,300
			Sat	n/a	60.0		180.4	12.9	9,200	660
			Sun	n/a	n/a		0.0	0.0	0	0
<hr/>										
3,960										
Transfort 7 modified South Transit Center <i>ave mph 16.30</i>	19.3	5.3	M-F	30.0	30.0	2.00	272.8	26.0	69,300	6,600
			Sat	n/a	60.0		137.3	12.9	7,000	660
			Sun	n/a	n/a		0.0	0.0	0	0
<hr/>										
7,260										
Jitterbus exist (one-way loop) <i>ave mph 16.62</i>	57.1	15.8	M-F	60.0	60.0	1.00	205.5	6.5	52,200	1,650
			Sat	n/a	60.0		205.9	6.5	10,500	330
			Sun	n/a	n/a		0.0	0.0	0	0
<hr/>										
62,700 1,980										
<b>LOCAL BUS TOTALS</b>						7	peak vehicles	M-F	270,100	21,450
						8	fleet vehicles	Sat.	47,400	3,640
								Sun.	0	0
								Annual	317,500	25,090

Notes for North I-25 corridor bus statistics:

- (1) Distance based on coded distances provided by Carter Burgess from transportation model (PKG\_RouteStatistics).
- (2) Run time based on calculated travel times from transportation model.
- (3) Service span based on existing service span (as of October 2005).
- (3) Calculated total fleet = peak vehicle requirement \* 1.2 (20% spare ratio).

**NO ACTION**

**OPERATING ASSUMPTIONS:**

WKDYPEAKHR	5.0		approx 6am-7pm
WKDYBASEHR	8.0		6am-9am; 3pm-5pm
WKDYVEVHR	0.0		9am-3pm; 5pm-7pm
WKDYELHR	0.0	13	
SATPEAKHR	0.0		
SATBASEHR	13.0		6am-7pm
SATELHR	0.0	13	
SUNPEAKHR	0.0		
SUNBASEHR	0.0		
SUNELHR	0.0	0	
ANNUAL WEEKDAYS	254		
ANNUAL SATURDAYS	51		
ANNUAL SUNDAYS, HOL	60	365	
ANNUALPEAK	1270		
ANNUALBASE	2695		
ANNUALEL	0		

*based on existing span of service*

**North I-25 EIS  
BUS OPERATING PLANS  
LOCAL/FEEDER CORRIDOR ROUTES - DEIS PACKAGE A**

Route	Run Time (minutes)	Distance (miles)	Headway					Peak Veh.	Daily Rev.		Annual Rev.	
			Day	Peak	Base	Eve	E/L		Veh Miles	Veh Hrs	Veh Miles	Veh Hrs
Transfort 5	30.2	6.7	M-F	60.0	60.0	n/a	n/a	1.25	213.8	20.0	54,300	5,080
			Sat	n/a	60.0	n/a	n/a		174.5	16.3	8,900	830
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>13.27</i>										
<hr/>												
											5,910	
Transfort 6	30.5	7.4	M-F	60.0	60.0	n/a	n/a	1.25	237.4	20.0	60,300	5,080
			Sat	n/a	60.0	n/a	n/a		192.2	16.3	9,800	830
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>14.58</i>										
<hr/>												
											5,910	
Transfort 7	26.0	6.5	M-F	30.0	30.0	n/a	n/a	2.00	416.1	32.0	105,700	8,130
			Sat	n/a	60.0	n/a	n/a		168.6	12.9	8,600	660
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>15.02</i>										
<hr/>												
											8,790	
Fox Trot	30.5	10.4	M-F	60.0	60.0	n/a	n/a	1.50	331.1	24.0	84,100	6,090
			Sat	n/a	60.0	n/a	n/a		268.6	19.4	13,700	990
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>20.34</i>										
<hr/>												
											7,080	
Jitterbus (one-way loop)	51.9	15.1	M-F	60.0	60.0	n/a	n/a	1.00	240.9	8.0	61,200	2,030
			Sat	n/a	60.0	n/a	n/a		196.1	6.5	10,000	330
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>17.41</i>										
<hr/>												
											2,360	
Tango	44.5	15.5	M-F	60.0	60.0	n/a	n/a	1.00	247.2	8.0	62,800	2,030
			Sat	n/a	60.0	n/a	n/a		200.0	6.5	10,200	330
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0
	<i>ave mph</i>	<i>20.83</i>										
<hr/>												
											2,360	
Milliken - Berthoud Feeder	32.6	15.1	M-F	60.0	60.0	n/a	n/a	2.00	483.1	32.0	122,700	8,130
			Sat	n/a	60.0	n/a	n/a		392.2	26.1	20,000	1,330
			Sun	n/a	60.0	n/a	n/a		393.3	26.0	23,600	1,560
	<i>ave mph</i>	<i>27.78</i>										
<hr/>												
											166,300	11,020
Firestone - Erie Feeder	52.9	15.5	M-F	30.0	60.0	n/a	n/a	4.00	679.9	44.0	172,700	11,180
			Sat	n/a	60.0	n/a	n/a		402.0	26.1	20,500	1,330
			Sun	n/a	60.0	n/a	n/a		401.7	26.0	24,100	1,560
	<i>ave mph</i>	<i>17.54</i>										
<hr/>												
											217,300	14,070
Grlly - FC Feeder	85.0	31.7	M-F	30.0	60.0	n/a	n/a	6.00	1,393.3	66.0	353,900	16,760
			Sat	n/a	60.0	n/a	n/a		823.5	39.0	42,000	1,990
			Sun	n/a	60.0	n/a	n/a		823.3	39.0	49,400	2,340
	<i>ave mph</i>	<i>22.35</i>										
<hr/>												
											445,300	21,090
Grlly - Loveland Feeder	63.8	23.9	M-F	15.0	30.0	n/a	n/a	10.00	2,106.3	110.0	535,000	27,940
			Sat	n/a	60.0	n/a	n/a		621.6	39.0	31,700	1,990
			Sun	n/a	60.0	n/a	n/a		621.7	39.0	37,300	2,340
	<i>ave mph</i>	<i>22.51</i>										
<hr/>												
											604,000	32,270
<b>LOCAL AND FEEDER BUS TOTALS</b>								30	peak vehicles	M-F	1,258,800	75,690
								36	fleet vehicles	Sat.	133,400	8,620
										Sun.	85,000	5,460
										Annual	1,477,200	89,770
<hr/>												
											1,432,900	78,450

## COMMUTER BUS CORRIDOR ROUTES - DEIS PACKAGE A

Route	Run Time (minutes)	Distance (miles)	Headway					Peak Veh.	Daily Rev.		Annual Rev.	
			Day	Peak	Base	Eve	E/L		Veh Miles	Veh Hrs	Veh Miles	Veh Hrs
US 85 commuter bus Grly to DUS	97.8	57.6	M-F	30.0	60.0	60.0	n/a	7.00	2,881.1	94.0	731,800	23,880
	<i>ave mph</i> 35.36		Sat	n/a	60.0	60.0	n/a		1,958.8	68.0	99,900	3,470
			Sun	n/a	60.0	60.0	n/a		1,958.3	68.0	117,500	4,080
											31,430	
US 85 commuter bus Grly to DIA	76.1	54.1	M-F	60.0	60.0	60.0	n/a	3.00	2,055.5	57.0	522,100	14,480
	<i>ave mph</i> 42.65		Sat	n/a	60.0	60.0	n/a		1,839.2	51.0	93,800	2,600
			Sun	n/a	60.0	60.0	n/a		1,840.0	51.0	110,400	3,060
											20,140	
<b>COMMUTER BUS TOTALS</b>								10	peak vehicles	M-F	1,253,900	38,360
								12	fleet vehicles	Sat.	193,700	6,070
										Sun.	<u>227,900</u>	<u>7,140</u>
										Annual	1,675,500	51,570

Notes for North I-25 corridor bus statistics:

- (1) Distance based on coded distances provided by Carter Burgess from transportation model (PKG\_RouteStatistics).
- (2) Run time based on calculated travel times from transportation model.
- (3) Distance and run times for each route use representative model data from a single package (rather than varying by package if route is identical). See cell comments for documentation on what package was used.
- (4) Calculated total fleet = peak vehicle requirement \* 1.2 (20% spare ratio).

### MODIFIED ROUTES

#### OPERATING ASSUMPTIONS:

WKDYPEAKHR	5.0		approx 6am-7pm	<i>based on existing span of service</i>
WKDYBASEHR	8.0		6am-9am; 3pm-5pm	
WKDYVEVHR	5.0		9am-3pm; 5pm-7pm	
WKDYELHR	0.0	18	4am-6am; 7pm-10pm	
SATPEAKHR	0.0			
SATBASEHR	13.0		6am-7pm	
SATELHR	0.0	13		
SUNPEAKHR	0.0			
SUNBASEHR	13.0		6am-7pm	
SUNELHR	0.0	13		
ANNUAL WEEKDAYS	254			
ANNUAL SATURDAYS	51			
ANNUAL SUNDAYS, HOL	60	365		
ANNUALPEAK	1270			
ANNUALBASE	3475			
ANNUALEL	1270			

**North I-25 EIS  
BUS OPERATING PLANS  
LOCAL/FEEDER CORRIDOR ROUTES - DEIS PACKAGE B**

Route	Run Time (minutes)	Distance (miles)	Headway					Peak Veh.	Daily Rev.		Annual Rev.		
			Day	Peak	Base	Eve	E/L		Veh Miles	Veh Hrs	Veh Miles	Veh Hrs	
Transfort 5 <i>ave mph 14.07</i>	23.2	5.4	M-F	60.0	60.0	n/a	n/a	1.00	173.6	16.0	44,100	4,070	
			Sat	n/a	60.0	n/a	n/a		141.2	12.9	7,200	660	
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0	
4,730													
Transfort 6 <i>ave mph 15.93</i>	26.0	6.9	M-F	60.0	60.0	n/a	n/a	1.00	220.9	16.0	56,100	4,070	
			Sat	n/a	60.0	n/a	n/a		180.4	12.9	9,200	660	
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0	
4,730													
Transfort 7 <i>ave mph 16.38</i>	19.2	5.3	M-F	30.0	30.0	n/a	n/a	2.00	335.8	32.0	85,300	8,130	
			Sat	n/a	60.0	n/a	n/a		137.3	12.9	7,000	660	
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0	
8,790													
Fox Trot <i>ave mph 20.89</i>	29.5	10.3	M-F	60.0	60.0	n/a	n/a	2.00	328.3	32.0	83,400	8,130	
			Sat	n/a	60.0	n/a	n/a		266.7	26.1	13,600	1,330	
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0	
9,460													
Jitterbus (one-way loop) <i>ave mph 18.78</i>	64.7	20.2	M-F	30.0	60.0	n/a	n/a	3.00	445.3	16.5	113,100	4,190	
			Sat	n/a	60.0	n/a	n/a		262.7	9.8	13,400	500	
			Sun	n/a	n/a	n/a	n/a		0.0	0.0	0	0	
										126,500		4,690	
Tango <i>ave mph 18.12</i>	44.6	13.5	M-F	60.0	60.0	n/a	n/a	1.00	215.4	8.0	54,700	2,030	
			Sat	n/a	60.0	n/a	n/a		174.5	6.5	8,900	330	
			Sun	n/a	60.0	n/a	n/a		350.0	13.0	21,000	780	
3,140													
Windsor - FC Feeder <i>ave mph 54.52</i>	32.2	29.3	M-F	60.0	60.0	n/a	n/a	2.00	937.8	32.0	238,200	8,130	
			Sat	n/a	60.0	n/a	n/a		762.7	26.1	38,900	1,330	
			Sun	n/a	60.0	n/a	n/a		761.7	26.0	45,700	1,560	
										322,800		11,020	
Johnstown - SH-119 Feeder <i>ave mph 24.08</i>	67.2	27.0	M-F	60.0	60.0	n/a	n/a	3.00	862.2	48.0	219,000	12,190	
			Sat	n/a	60.0	n/a	n/a		700.0	39.0	35,700	1,990	
			Sun	n/a	60.0	n/a	n/a		700.0	39.0	42,000	2,340	
										296,700		16,520	
Fort Lupton - Niwot Feeder <i>ave mph 19.68</i>	62.5	20.5	M-F	30.0	60.0	n/a	n/a	5.00	901.6	55.0	229,000	13,970	
			Sat	n/a	60.0	n/a	n/a		533.3	32.5	27,200	1,660	
			Sun	n/a	60.0	n/a	n/a		533.3	39.0	32,000	2,340	
										288,200		17,970	
Loveland - Crossroad Feeder <i>ave mph 20.78</i>	16.6	5.8	M-F	30.0	60.0	n/a	n/a	2.00	253.5	22.0	64,400	5,580	
			Sat	n/a	60.0	n/a	n/a		149.0	12.9	7,600	660	
			Sun	n/a	60.0	n/a	n/a		150.0	13.0	9,000	780	
										81,000		7,020	
<b>LOCAL AND FEEDER BUS TOTALS</b>								22	peak vehicles	M-F	1,187,300	70,490	
								26	fleet vehicles	Sat.	168,700	9,780	
										Sun.	149,700	7,800	
									Annual		1,505,700	88,070	

## BRT CORRIDOR ROUTES - DEIS PACKAGE B

Route	Run Time (minutes)	Distance (miles)	Headway					Peak Veh.	Daily Rev.		Annual Rev.	
			Day	Peak	Base	Eve	E/L		Veh Miles	Veh Hrs	Veh Miles	Veh Hrs
Greeley to DUS BRT	84.7	63.6	M-F	60.0	60.0	60.0	n/a	3.00	2,416.9	57.0	613,900	14,480
			Sat	n/a	60.0	60.0	n/a		2,162.7	51.0	110,300	2,600
<i>ave mph</i>	<i>45.07</i>		Sun	n/a	60.0	60.0	n/a		2,163.3	51.0	129,800	3,060
Greeley to DUS BRT Tripper	84.7	63.6	M-F	30.0	n/a	n/a	n/a	6.00	763.4	16.9	193,900	4,300
24,440												
FC to DUS BRT	97.8	57.6	M-F	60.0	60.0	60.0	n/a	4.00	1,843.7	64.0	468,300	16,260
			Sat	n/a	60.0	60.0	n/a		1,958.8	136.1	99,900	6,940
<i>ave mph</i>	<i>35.36</i>		Sun	n/a	60.0	60.0	n/a		1,958.3	136.0	117,500	8,160
FC to DUS BRT Tripper	97.8	57.6	M-F	30.0	n/a	n/a	n/a	6.00	691.3	19.6	175,600	4,970
36,330												
FC to DIA BRT	78.1	59.7	M-F	60.0	60.0	60.0	n/a	3.00	2,269.3	57.0	576,400	14,480
			Sat	n/a	60.0	60.0	n/a		2,029.4	102.0	103,500	5,200
<i>ave mph</i>	<i>45.88</i>		Sun	n/a	60.0	60.0	n/a		2,030.0	102.0	121,800	6,120
25,800												
<b>BUS RAPID TRANSIT TOTALS</b>								22	peak vehicles	M-F	2,028,100	54,490
								26	fleet vehicles	Sat.	313,700	14,740
										Sun.	<u>369,100</u>	<u>17,340</u>
										Annual	2,710,900	86,570

Notes for North I-25 corridor bus statistics:

- (1) Distance based on coded distances provided by Carter Burgess from transportation model (PKG\_RouteStatistics).
- (2) Run time based on calculated travel times from transportation model.
- (3) Distance and run times for each route use representative model data from a single package (rather than varying by package if route is identical). See cell comments for documentation on what package was used.
- (4) Calculated total fleet = peak vehicle requirement \* 1.2 (20% spare ratio).

### CORRIDOR BUS ROUTES

#### OPERATING ASSUMPTIONS:

WKDYPEAKHR	6.0	4am-11pm	<i>based on using similar service span as rail lines to Ft. Collins</i>
WKDYBASEHR	10.0	5am-8am; 3pm-6pm	
WKDYVEVHR	3.0	8am-3pm; 6pm-9pm	
WKDYELHR	0.0	4am-5am; 9pm-11pm	
SATPEAKHR	0.0		
SATBASEHR	13.0	6am-7pm	
SATELHR	0.0	13	
SUNPEAKHR	0.0		
SUNBASEHR	13.0	6am-7pm	
SUNELHR	0.0	13	
ANNUAL WEEKDAYS	254		
ANNUAL SATURDAYS	51		
ANNUAL SUNDAYS, HOL	60	365	
ANNUALPEAK	1524		
ANNUALBASE	3983		
ANNUALEL	762		



**APPENDIX E**  
**RAIL OPERSTAT WORKSHEETS**

**North I-25 EIS  
No Action  
(based on FasTracks 2025 Horizon Year DMU Operating Statistics)**

Rail Line	Run Time Distance		Day	Headway				Consist				Vehicles		Annual				Trains			
	(minutes)	(miles)		Peak	Base	Eve.	E/L	Peak	Base	Eve.	E/L	Peak	Total	Train-Mi's	Car-Miles	Train-Hrs	Car-Hrs	Peak	Base	Eve.	E/L
1st/Terry to DUS (US 36 Line)	58.57	40.01	M-F	30.0	30.0	60.0	n/a	2.0	2.0	2.0	n/a	10	12	714,000	1,428,000	22,700	45,390	5.000	5.000	3.000	0.000
			Sat	n/a	60.0	60.0	n/a	n/a	2.0	2.0	n/a			73,000	146,000	2,730	5,460	0.000	3.000	3.000	0.000
			Sun	n/a	60.0	60.0	n/a	n/a	2.0	2.0	n/a			81,000	162,000	3,050	6,090	0.000	3.000	3.000	0.000
Pearl/30th to DUS (US 36 Line)	42.48	27.96	M-F	30.0	n/a	n/a	n/a	2.0	n/a	n/a	n/a	8	10	57,000	114,000	2,040	4,080	4.000	0.000	0.000	0.000
			Sat	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			0	0	0	0	0.000	0.000	0.000	0.000
			Sun	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			0	0	0	0	0.000	0.000	0.000	0.000
SH-7/160th to DUS (North Metro Line)	33.10	20.45	M-F	30.0	30.0	30.0	30.0	3.0	2.0	2.0	1.0	9	11	448,000	970,000	16,450	35,570	3.000	3.000	3.000	3.000
			Sat	n/a	30.0	30.0	30.0	n/a	2.0	2.0	1.0			91,000	166,000	3,350	6,080	0.000	3.000	3.000	3.000
			Sun	n/a	30.0	30.0	30.0	n/a	2.0	2.0	1.0			102,000	185,000	3,740	6,790	0.000	3.000	3.000	3.000
124th to DUS (North Metro Line)	25.03	15.53	M-F	30.0	n/a	n/a	n/a	3.0	n/a	n/a	n/a	6	7	48,000	143,000	1,530	4,590	2.000	0.000	0.000	0.000
			Sat	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			0	0	0	0	0.000	0.000	0.000	0.000
			Sun	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			0	0	0	0	0.000	0.000	0.000	0.000
<b>ESTIMATED TOTALS</b>												<b>33</b>	<b>40</b>	<b>1,614,000</b>	<b>3,314,000</b>	<b>55,590</b>	<b>114,050</b>	<b>14.0</b>	<b>8.0</b>	<b>6.0</b>	<b>3.0</b>

1. Travel time and distance calculations based on MPA travel time worksheets prepared for FasTracks Plan
2. Peak period train consists based on F115 Fand J25 peak period line load forecasts.
3. Minimum 2-car trains assumed on all lines in the peak period. With exception of DIA-DUS line, 2-car trains assumed on all other lines in the base and eve. periods.
4. 1 power/1trailer car assumed for the US 36 line, 2 power/2 trailer casts assumed for East/DIA line, 2 power/1trailer car assumed for North Metro line.
5. Trip calculations for short turn trains on US 36 and North Metro assume 2 hours of peak direction service in each peak period.

**North I-25 EIS  
Package A - DEIS  
North Metro Line extended to Fort Collins; US 36 Line extended to Sugar Mill**

Rail Line	Run Time Distance (minutes)	Day	Headway		Consist		Vehicles Peak Total	Annual			Trains						
			Peak	Eve.	Peak	Eve.		E/L	Train-Mi's	Car-Miles	Train-Hrs	Car-Hrs	Peak	Eve.	E/L		
Sugar Mill to DUS (US 36 Line)	62.53	M-F	30.0	60.0	n/a	n/a	10	12	526,000	1,053,000	17,600	35,190	5.0	3.0	0.0		
		Sat	n/a	60.0	n/a	n/a	n/a	n/a	75,000	150,000	2,730	5,460	0.0	3.0	0.0		
		Sun	n/a	60.0	n/a	n/a	n/a	n/a	n/a	84,000	168,000	3,050	6,090	0.0	3.0	0.0	
1st/Terry to DUS (US 36 Line)	58.57	M-F	n/a	n/a	n/a	n/a	0	0	204,000	408,000	5,100	10,200	0.0	2.0	0.0		
		Sat	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
		Sun	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
Pearl/30th to DUS (US 36 Line)	42.48	M-F	30.0	n/a	n/a	n/a	8	10	57,000	114,000	2,040	4,080	4.0	0.0	0.0		
		Sat	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
		Sun	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
Ft Collins to DUS - V align. (North Metro Line)	103.65	M-F	30.0	60.0	n/a	n/a	24	29	890,000	2,206,000	25,500	63,240	8.0	4.0	0.0		
		Sat	n/a	60.0	n/a	n/a	n/a	n/a	127,000	254,000	3,640	7,280	0.0	4.0	0.0		
		Sun	n/a	60.0	n/a	n/a	n/a	n/a	142,000	283,000	4,060	8,120	0.0	4.0	0.0		
SH-7/160th to DUS (North Metro Line)	33.10	M-F	n/a	60.0	30.0	n/a	2.0	1.0	188,000	323,000	8,540	15,170	0.0	2.0	3.0		
		Sat	n/a	60.0	30.0	n/a	2.0	1.0	54,000	91,000	2,440	4,260	0.0	2.0	3.0		
		Sun	n/a	60.0	30.0	n/a	2.0	1.0	60,000	102,000	2,730	4,760	0.0	2.0	3.0		
124th to DUS (North Metro Line)	25.03	M-F	30.0	n/a	n/a	n/a	6	7	48,000	143,000	1,530	4,590	2.0	0.0	0.0		
		Sat	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
		Sun	n/a	n/a	n/a	n/a	n/a	n/a	0	0	0	0	0.0	0.0	0.0		
<b>ESTIMATED TOTALS</b>								<b>48</b>	<b>58</b>	<b>2,455,000</b>	<b>5,295,000</b>	<b>78,960</b>	<b>168,440</b>	<b>19.0</b>	<b>11.0</b>	<b>9.0</b>	<b>3.0</b>

1. Travel time and distance calculations based on MPA travel time worksheets prepared for FasTracks Plan
2. Peak period train consists based on F115 Fand J25 peak period line load forecasts.
3. Minimum 2-car trains assumed on all lines in the peak period. With exception of DIA-DUS line, 2-car trains assumed on all other lines in the base and eve. periods.
4. 1 power/trailer car assumed for the US 36 line, 2 power/2 trailer casts assumed for East/DIA line, 2 power/trailer car assumed for North Metro line.
5. Trip calculations for short turn trains on US 36 and North Metro assume 2 hours of peak direction service in each peak period.

## **APPENDIX F RAIL O&M COST MODEL**

## Denver North I-25 Commuter Rail O&M Cost Estimate

### No-Action Alternative

#### OPERATING CHARACTERISTICS

Variable	Code Name	Input Statistics
Peak Locomotives	PKLOCO	14
Peak Passenger Cars	PKCAR	33
Annual Rev. Car-Miles	CARMI	3,314,000
Annual Rev. Train-Miles	LOCOMI	1,614,000
Annual Rev. Train-Hours	TRNHR	55,590
Passenger Stations	STATION	18
Route Miles	RTMILE	60.46
Yards (storage yard = .25)	YARD	2
Inflation Factor***	INFLETE	0.964
Year of Dollars	n/a	2005

#### DETAILED COST ESTIMATE

Div./Dept./Cost Item	Cost Type	Product'y Factor	Driver	FTEs	Average Salary	Dept. Expenses	Cost Totals
<b>Transit Agency Expenses</b>							<b>\$14,015,523</b>
<b>Risk Mgmt. &amp; Gen'l. Liability</b>							
Casualty & Liability (50%)	INSUR	\$635,977	Fixed			\$635,977	
Casualty & Liability (25%)	INSUR	\$52	TRNHR			\$2,786,616	
Casualty & Liability (25%)	INSUR	\$3,868	RTMILE			\$225,440	<b>\$3,648,032</b>
<b>Vehicle Maintenance</b>							
Diesel Fuel	FUEL	\$2,563	* 1.5 gallons/mile * train-miles *1.10			\$6,579,806	<b>\$6,579,806</b>
<b>Facility Maintenance</b>							
Earnings - Mechanic	LABOR	10	1/10 Stations, min. of 1	2.0	\$46,800	\$90,230	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$49,627	
Contract Services, Stations	SERV	\$42,075	STATION (50%)			\$730,085	
Contract Services, Yard & Leads	SERV	\$75,000	YARD			\$144,600	
Materials & Supplies, Stations	MATL	\$8,333	STATION			\$144,600	
Utilities, Yard	UTIL	\$57,500	YARD			\$110,860	
Utilities, Station	UTIL	\$5,278	STATION			\$91,580	
Other	OTHER	\$1,000	Dept. employee			\$1,928	<b>\$1,363,511</b>
<b>Finance/Revenue Collection/Money Counting</b>							
Earnings - Administrative	LABOR	n/a	Fixed	1.0	\$83,200	\$80,205	
Earnings - Accounts Payable	LABOR	25000	1/25k trainmi, min. of 1	2.0	\$41,600	\$80,205	
Earnings - Money Counting	LABOR	10	1/10 Stations, min. of 1	2.0	\$39,520	\$76,195	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$130,132	
Money Counting Security	SERV	\$11,000	STATION			\$190,872	
TVM Maintenance & Repair	SERV	\$5,556	STATION			\$100,000	
Other Contractual Services	SERV	\$21,000	Dept. employee			\$101,220	
Materials & Supplies	MATL	\$4,000	STATION			\$72,000	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$4,820	<b>\$835,648</b>
<b>Purchasing</b>							
Earnings	LABOR	n/a	Fixed	1.0	\$49,920	\$48,123	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$26,468	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$964	<b>\$75,554</b>
<b>Marketing/Customer Services/Public Relations</b>							
Earnings - Administrative	LABOR	n/a	Fixed	1.0	\$62,400	\$60,154	
Earnings - Cust. Service Rep.	LABOR	25,000	1/25k trainmi, min. of 1	2.0	\$39,520	\$76,195	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$74,991	
Contractual Services	SERV	n/a	Fixed			\$250,000	
Materials & Supplies	MATL	\$50,000	Fixed			\$48,200	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$2,892	<b>\$512,432</b>
<b>Safety/Police/Security</b>							
Earnings - Safety Specialist	LABOR	n/a	Fixed	1.0	\$58,240	\$56,143	
Earnings - Police Officers	LABOR	10,000	1/10k trainmi, min. of 2	6.0	\$58,240	\$336,860	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$216,152	
Security Services	SERV	\$200,000	YARD			\$385,600	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$5,784	<b>\$944,396</b>
<b>Train Expenses</b>							<b>\$47,566,179</b>
<b>Train Operations/Equip. Maintenance/Track Usage/Maint.</b>							
Engineer/Conductor/Crew Exp.	RR	\$402	TRAINHR			\$22,324,908	
Maint. of Equip (Labor)	RR	\$45,480	PKLOCO+PKCAR			\$2,137,560	
Maint. Materials/Handling	RR	\$17,147	PKLOCO+PKCAR			\$805,893	
Other	RR	64.31%	% of Train Ops/Equip. Maint. Costs			\$16,249,332	
Track Maintenance (75%)	RR	\$56,016	RTMILE			\$3,386,705	
Track Maintenance (25%)	RR	\$0.80	CARMI			\$2,661,780	
<b>TOTAL OPERATING BUDGET</b>							<b>\$61,581,702</b>

**Denver North I-25 Commuter Rail O&M Cost Estimate**  
**DEIS Package A Alternative**

**OPERATING CHARACTERISTICS**

Variable	Code Name	Input Statistics
Peak Locomotives	PKLOCO	19
Peak Passenger Cars	PKCAR	48
Annual Rev. Car-Miles	CARMI	5,295,000
Annual Rev. Train-Miles	LOCOMI	2,455,000
Annual Rev. Train-Hours	TRNHR	78,960
Passenger Stations	STATION	28
Route Miles	RTMILE	111.07
Yards (storage yard = .25)	YARD	3
Inflation Factor***	INFLATE	0.964
Year of Dollars	n/a	2005

**DETAILED COST ESTIMATE**

Div./Dept./Cost Item	Cost Type	Product'y Factor	Driver	FTEs	Average Salary	Dept. Expenses	Cost Totals
<b>Transit Agency Expenses</b>							<b>\$20,333,683</b>
<b>Risk Mgmt. &amp; Gen'l. Liability</b>							
Casualty & Liability (50%)	INSUR	\$635,977	Fixed			\$635,977	
Casualty & Liability (25%)	INSUR	\$52	TRNHR			\$3,958,107	
Casualty & Liability (25%)	INSUR	\$3,868	RTMILE			\$414,152	<b>\$5,008,236</b>
<b>Vehicle Maintenance</b>							
Diesel Fuel	FUEL	\$2,563	* 1.5 gallons/mile * train-miles *1.10			\$10,008,318	<b>\$10,008,318</b>
<b>Facility Maintenance</b>							
Earnings - Mechanic	LABOR	10	1/10 Stations, min. of 1	3.0	\$46,800	\$135,346	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$74,440	
Contract Services, Stations	SERV	\$42,075	STATION (50%)			\$1,135,688	
Contract Services, Yard & Leads	SERV	\$75,000	YARD			\$216,900	
Materials & Supplies, Stations	MATL	\$8,333	STATION			\$224,933	
Utilities, Yard	UTIL	\$57,500	YARD			\$166,290	
Utilities, Station	UTIL	\$5,278	STATION			\$142,458	
Other	OTHER	\$1,000	Dept. employee			\$2,892	<b>\$2,098,947</b>
<b>Finance/Revenue Collection/Money Counting</b>							
Earnings - Administrative	LABOR	n/a	Fixed	1.0	\$83,200	\$80,205	
Earnings - Accounts Payable	LABOR	25000	1/25k trainmi, min. of 1	3.0	\$41,600	\$120,307	
Earnings - Money Counting	LABOR	10	1/10 Stations, min. of 1	3.0	\$39,520	\$114,292	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$173,142	
Money Counting Security	SERV	\$11,000	STATION			\$296,912	
TVM Maintenance & Repair	SERV	\$5,556	STATION			\$155,556	
Other Contractual Services	SERV	\$21,000	Dept. employee			\$141,708	
Materials & Supplies	MATL	\$4,000	STATION			\$112,000	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$6,748	<b>\$1,200,870</b>
<b>Purchasing</b>							
Earnings	LABOR	n/a	Fixed	1.0	\$49,920	\$48,123	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$26,468	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$964	<b>\$75,554</b>
<b>Marketing/Customer Services/Public Relations</b>							
Earnings - Administrative	LABOR	n/a	Fixed	1.0	\$62,400	\$60,154	
Earnings - Cust. Service Rep.	LABOR	25,000	1/25k trainmi, min. of 1	3.0	\$39,520	\$114,292	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$95,945	
Contractual Services	SERV	n/a	Fixed			\$250,000	
Materials & Supplies	MATL	\$50,000	Fixed			\$48,200	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$3,856	<b>\$572,446</b>
<b>Safety/Police/Security</b>							
Earnings - Safety Specialist	LABOR	n/a	Fixed	1.0	\$58,240	\$56,143	
Earnings - Police Officers	LABOR	10,000	1/10k trainmi, min. of 2	8.0	\$58,240	\$449,147	
Fringe Benefits	LABOR	55.0%	Dept. earnings			\$277,910	
Security Services	SERV	\$200,000	YARD			\$578,400	
Other Non-Labor Expenses	OTHER	\$1,000	Dept. employee			\$7,712	<b>\$1,313,169</b>
<b>Train Expenses</b>							<b>\$69,471,088</b>
<b>Train Operations/Equip. Maintenance/Track Usage/Maint.</b>							
Engineer/Conductor/Crew Exp.	RR	\$402	TRAINHR			\$31,710,285	
Maint. of Equip (Labor)	RR	\$45,480	PKLOCO+PKCAR			\$3,047,160	
Maint. Materials/Handling	RR	\$17,147	PKLOCO+PKCAR			\$1,148,827	
Other	RR	64.31%	% of Train Ops/Equip. Maint. Costs			\$23,090,256	
Track Maintenance (75%)	RR	\$56,016	RTMILE			\$6,221,655	
Track Maintenance (25%)	RR	\$0.80	CARMI			\$4,252,904	
<b>TOTAL OPERATING BUDGET</b>							<b>\$89,804,771</b>