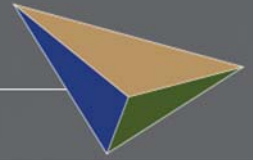


Chapter 8

Plan Scenarios



LaSalle Community Center. Image Credit: Town of LaSalle

Chapter 8: Plan Scenarios

Moving Ahead for Progress in the 21st Century Act (MAP-21) recommends the incorporation of scenario planning into metropolitan transportation plans.⁵⁷ When developing scenarios, an analysis of how a scenario impacts the transportation system and its performance is required. The Federal Highway Administration's (FHWA) *Performance Based Planning and Programming Guidebook (PBPP)*⁵⁸ recommends the following be considered when developing scenarios:

- ▶ Potential regional investment strategies for the planning horizon;
- ▶ Distribution of population and employment;
- ▶ Maintaining baseline conditions for the transportation system performance measures;
- ▶ Estimated costs and potential revenues available;
- ▶ Revenue constrained scenarios based on the total revenue reasonably expected to be available; and
- ▶ US Department of Transportation (USDOT) transportation system performance measures and locally developed measures.

Further, the PBPP lists benefits of scenario planning:

- ▶ Opportunity to engage a wide variety of stakeholders;
- ▶ Potential to clearly illustrate the trade-offs among different land use and transportation choices;
- ▶ More informed decision making;
- ▶ Helps decision makers develop performance measures and evaluate different policies for their impacts on targets; and
- ▶ Ideal method to focus on the broader array of issues implied by the focus on livability.

The North Front Range Metropolitan Planning Organization (NFRMPO) maintains three sets of data with the ability to be manipulated for scenario planning: land use – households and employment, roadway – capacity, and transit – route changes and improvements. The two types of scenarios selected for this 2040 RTP:

1. All transportation investments from 2012 to 2040 occur for road and highway projects, while all future household and employment growth from 2012 to 2040 remain constant.
2. All transportation investments from 2012 to 2040 occur for transit projects, while all future household and employment growth from 2012 to 2040 remain constant.

Each scenario is detailed in the remaining sections of this chapter. The NFRMPO is estimated to receive \$71.7 M of Surface Transportation (STP-Metro) funding and \$82.7 M of Congestion Mitigation and Air Quality (CMAQ) funding from 2016 to 2040. STP-Metro is the most flexible funding pool the NFRMPO receives, allowing funds for most roadway, transit, and non-motorized projects. This funding pool is represented for both scenarios. CMAQ does allow certain roadway projects, such as Intelligent Transportation Systems (ITS) and adaptive signal

⁵⁷ *MAP-21 Factsheet: Metropolitan Planning*, <http://www.fhwa.dot.gov/map21/factsheets/mp.cfm>, 2012

⁵⁸ *Performance Based Planning and Programming Guidebook*
http://www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/pbppguidebook.pdf, 2013

systems; however, the NFRMPO 2040 Regional Travel Demand Model (RTDM) is unable to model these types of improvements. Because of this, only the transit scenario is represented with CMAQ funding, **Table 8-1**.

Table 8-1: Scenario Funding		
Funding Pool	Roadway Scenario	Transit Scenario
STP-Metro	\$71,725,203	\$71,725,203
CMAQ	\$0	\$82,721,692
Total	\$71,725,203	\$154,446,895

Roadway analysis scenarios were run in conjunction with the roadway scenario to demonstrate the build-out of I-25 in the NFRMPO region. These roadway analysis scenarios are unconstrained and detailed in **Section A** of this chapter.

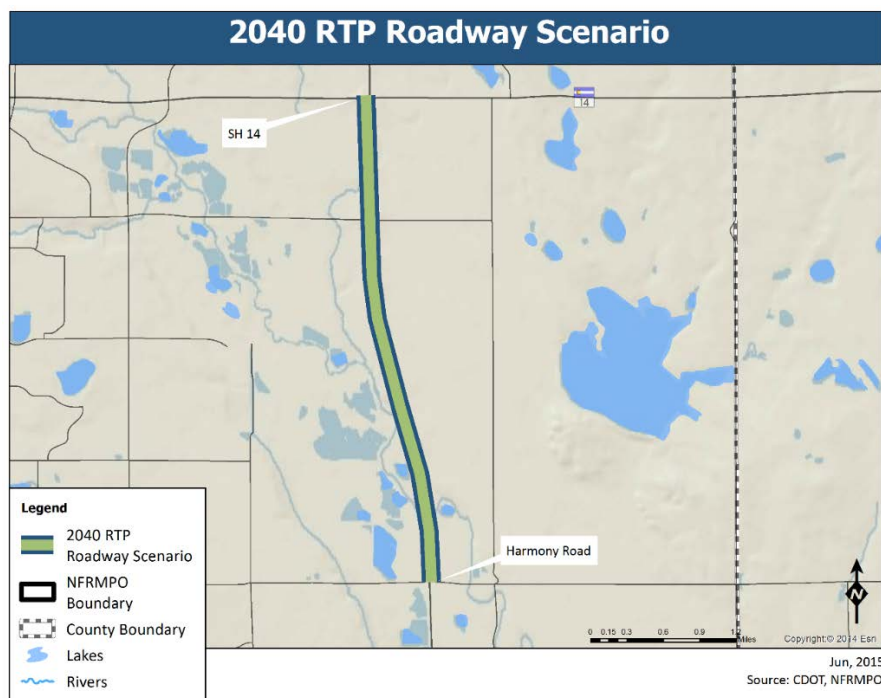
A. Roadway Scenario

The priority roadway corridor for the NFRMPO Planning Council is I-25 due to its north-south connections serving the entire region. As stated in the *North I-25 Environmental Impact Statement (EIS)*, the improvements begin at SH 14 on the north adding a third lane in both directions to meet the three lane section in Mead, approximately SH 66. Based on available funding shown in **Table 8-1**, the following defines the improvement made within fiscal constraint and is reflected in **Figure 8-1**:

2040 Regional Transportation Plan (RTP) Roadway Scenario: SH 14 to Harmony Road

- ▶ Widen I-25 between SH 14 and Harmony Road, including the Prospect Road interchange, approximately four miles in length.

Figure 8-1: 2040 RTP Roadway Scenario



Tables 8-2 through 8-4 compare the 2040 RTP Roadway Scenario to the 2040 Build Scenario, showing lane-miles, number of interchange improvements, Vehicle Miles Traveled (VMT), Vehicle Hours Traveled (VHT), and the estimated cost.

Table 8-2: Improvements and Cost of 2040 RTP Roadway Scenario			
	Lane-Miles Added	Number of Interchanges for Improvements	Cost
2040 (Build)	0	0	\$0
2040 RTP Roadway Scenario	8	1	\$71,725,203*
*This is not the total project cost, rather a reasonable share for the NFRMPO Sources: <i>NFRMO 2040 Regional Travel Demand Model, North I-25 EIS</i>			

Table 8-3: Vehicle Miles Traveled (VMT) of 2040 RTP Roadway Scenario		
	VMT	Percent Increase in VMT
2040 (Build)	19,290,069	-
2040 RTP Roadway Scenario	19,290,809	0.004
Source: <i>NFRMO 2040 Regional Travel Demand Model</i>		

Table 8-4: Vehicle Hours Traveled (VHT) of 2040 RTP Roadway Scenario		
	VHT	Percent Decrease in VHT
2040 (Build)	746,736	-
2040 RTP Roadway Scenario	746,515	0.030
Source: <i>NFRMO 2040 Regional Travel Demand Model</i>		

For this Scenario, VMT is projected to increase by 0.004 percent compared to the 2040 Build Scenario, **Table 8-3**. With the same comparison VHT is projected to decrease by 0.030 percent, **Table 8-4**.

As I-25 continues to receive widening improvements, more users will be attracted to use it, increasing the VMT. At the same time, widening decreases the amount of congestion, allowing the VHT to decrease. **Figure 8-2** shows the travel time index (TTI) representing congestion, segments greater than 2.5 times free flow, of the 2040 RTP Roadway Scenario compared to the 2040 (Build) network. When there is a decrease in TTI, the time it takes to travel along the roadway has increased 2.5 times or more than the roadway was built to handle. When there is an increase in TTI, the time it takes to travel along the roadway has decreased to 2.5 times or less than the roadway was built to handle. **Table 8-5** details each with changes in TTI.

Figure 8-2: 2040 RTP Roadway Scenario Travel Time Index (TTI)

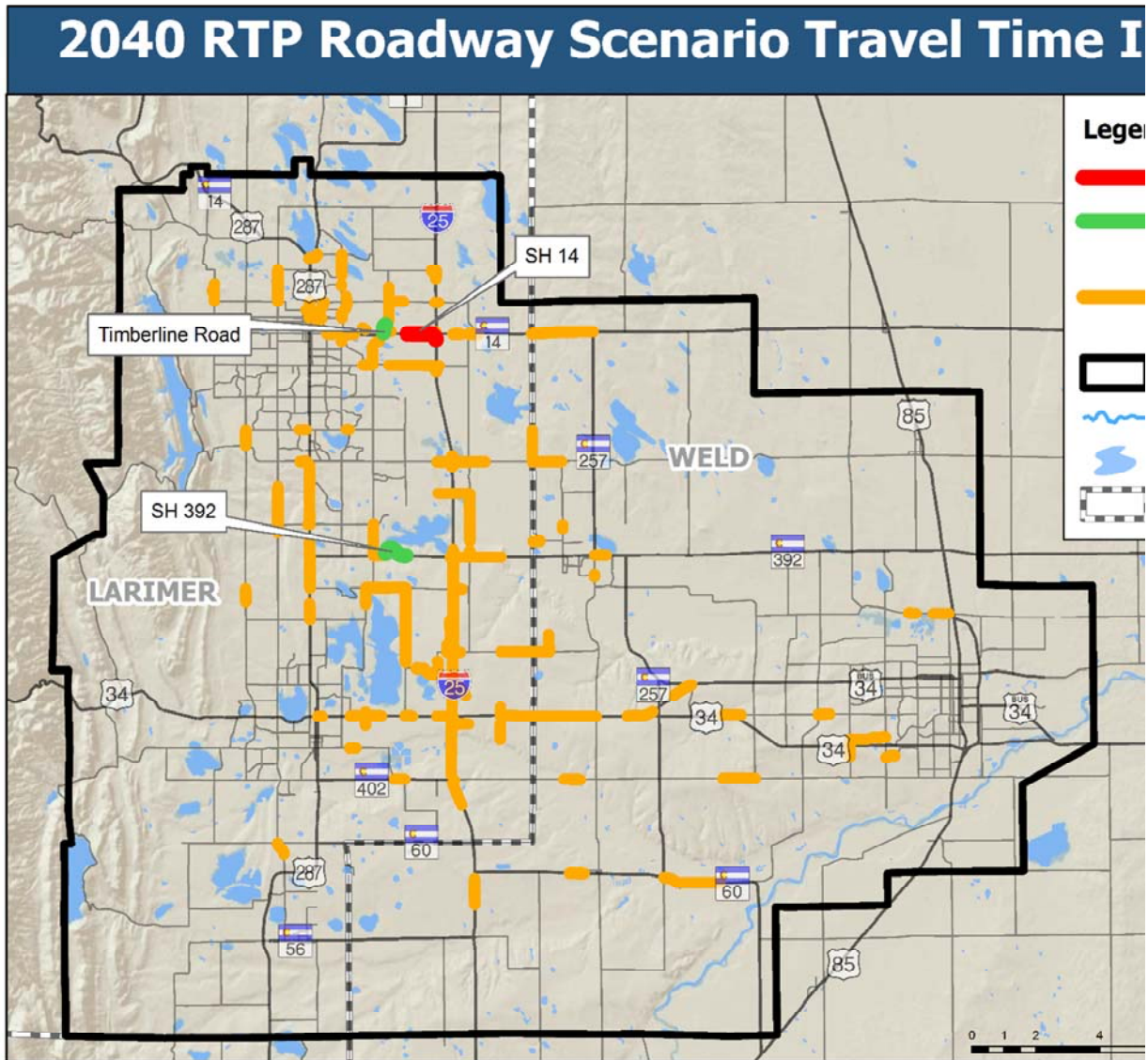


Table 8-5: 2040 RTP Roadway Scenario Travel Time Index (TTI) Results				
	From	To	TTI Before	TTI After
North-to-South Segments				
Timberline Road	Donella Court	Lincoln Avenue	2.52	2.47
East-to-West Segments				
SH 14	Dawn Avenue	Stockton Avenue	2.49	2.51
SH 14	Stockton Avenue	Approximately I-25/SH 14 Southbound Ramp	2.48	2.54
SH 14	Approximately I-25/SH 14 Southbound Ramp	Approximately I-25/SH 14 Southbound Ramp	2.49	2.99
SH 392	Duck Lake	Larimer CR 9	2.52	2.49
<i>Source: NFRMO 2040 Regional Travel Demand Model</i>				

Analysis Scenarios

The following 2040 RTP Roadway Analysis Scenarios were run to identify the impact of building out I-25 on the transportation network. These scenarios surpass the total amount of funding the NFRMPO is projected to receive between 2016 and 2040 and would need additional sources to be funded. The following scenarios were run representing this unconstrained development:

2040 RTP Roadway Analysis Scenario One: SH 14 to SH 392

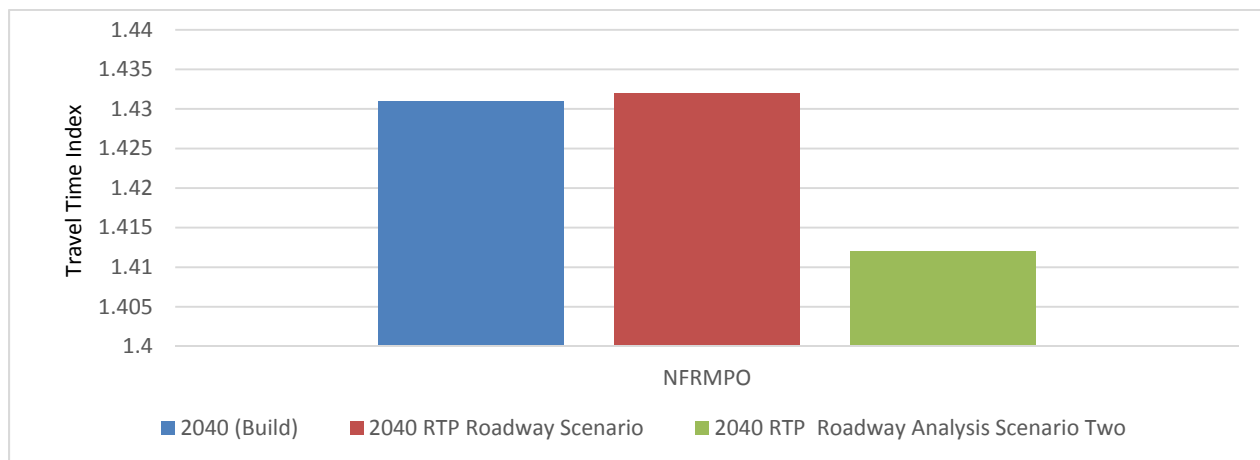
- ▶ Widen I-25 between SH 14 and SH 392, including the Prospect Road interchange, approximately seven miles in length.

2040 RTP Roadway Analysis Scenario Two: SH 14 to NFRMPO Southern Boundary

- ▶ This scenario represents the entire build-out of I-25 in the NFRMPO region. Work would need to be completed on each interchange along the segment, according to the *North I-25 EIS*.

The average VMT increase per-mile added is 0.001 percent between the two 2040 RTP Roadway Analysis Scenarios. The VHT also decreases on average 0.013 percent per-mile. **Figure 8-3** compares the total TTI for all segments in the NFRMPO for the 2040 RTP Roadway Scenario compared to the 2040 RTP Roadway Analysis Scenario Two, the analysis scenario with the most lane-miles added. This demonstrates the change in the average TTI on I-25 in the fiscally constrained scenario to the unconstrained scenario with the most impact. Based on the output, a small capacity change will increase the average TTI slightly and a larger capacity change will decrease the average TTI significantly.

Figure 8-3: Average Travel Time Index (TTI) for the NFRMPO Comparison



B. Transit Scenario

Fixed-route transit service typically relies on a system of routes, rather than a single route. This concept makes transit scenario planning more difficult than roadway scenario planning. A reasonable transit scenario with the NFRMPO 2040 RTDM was made with the socio-economic data and system-level route data from the various NFRMPO member agencies. The individual system-wide improvements for each transit agency are detailed in this chapter, followed by a summary of regional transit ridership results for the following scenario:

2040 RTP Transit Scenario

- ▶ **Transfort – Transfort Strategic Operating Plan Phase 3** and increased headways on routes:
 - Taft Hill: 30 minute
 - East Mulberry: 30 minute
 - Lemay: 30 minute
 - Trilby/Timberline: 30 minute
 - Harmony Road Enhanced Travel Corridor Improvements
 - Poudre Valley Hospital Transit Center
- ▶ **Greeley-Evans Transit (GET) – New Routes (2016)** and increased headways on routes:
 - Route 1 (previously Red Route): 30 minute
 - Route 2 (previously Gold Route): 30 minute
 - Route 6 (previously Blue Route): 30 minute
- ▶ **City of Loveland Transit (COLT) – Existing Routes (2011)**
- ▶ **Orchards Transit Center**
- ▶ **RTE – Community Connections**
 - Loveland and Greeley/Evans area
 - Fort Collins and Greeley/Evans area
- ▶ **Park and Ride Improvements**
- ▶ **Ozone Season Ride Free Programs**
- ▶ **ADA Sidewalk and Transit Shelters**

The associated cost for each improvement of the scenario is detailed in **Table 8-6**. The cost reflects what is reasonably available for the NFRMPO within fiscal constraint.

Table 8-6: 2040 RTP Transit Scenario Cost of Improvements	
Improvement	Cost
Transfort Strategic Operating Plan Phase 3 and increased headways	
Taft Hill	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
East Mulberry	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
Lemay	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
Trilby/Timberline	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
Harmony Enhanced Travel Corridor	
Lemay, Timberline, Ziegler Queue Jump	\$9,520,000
Bus stations and stops	\$4,020,000
Bus Purchase (5 @ \$500,000 each)	\$2,000,000
Total	\$15,540,000
West Elizabeth Enhanced Travel Corridor	
Guideway	\$29,860,000
Bus Purchase (10 @ \$500,000 each)	\$5,000,000
Total	\$34,860,000
Transfer Center (Poudre Valley Hospital Transit Center)	\$4,000,000
Total Transfort Improvement Cost	\$70,304,840
Greeley-Evans Transit (GET) New Routes (2016) and increased headways	
Route 1	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$176,103 each bus)	\$880,515
Total	\$3,976,210
Table 8-7: 2040 RTP Transit Scenario Cost of Improvements	

Improvement	Cost
Route 2	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$176,103 each bus)	\$1,476,210
Total	\$3,976,210
Route 6	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$176,103 each bus)	\$880,515
Total	\$3,976,210
Transfer (Greeley Mall and Downtown Transit Center)	\$6,300,000
Total GET Improvement Cost	\$18,228,630
City of Loveland Transit (COLT) Existing Routes	
Route 100	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$293,355 each bus)	\$1,466,775
Total	\$3,966,775
Route 200	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$293,355 each bus)	\$1,466,775
Total	\$3,976,210
Route 300	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$293,355 each bus)	\$1,466,775
Total	\$3,976,210
Orchards Transfer Center	\$4,000,000
Total	\$15,928,639
RTE Community Connections	
Loveland And Greeley	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
Fort Collins and Greeley	
Bus Purchase (5 @ \$500,000 each)	\$2,500,000
Operations (\$295,242 each bus)	\$1,476,210
Total	\$3,976,210
Total Cost of RTE Community Connections	\$7,952,420

Table 8-8: 2040 RTP Transit Scenario Cost of Improvements

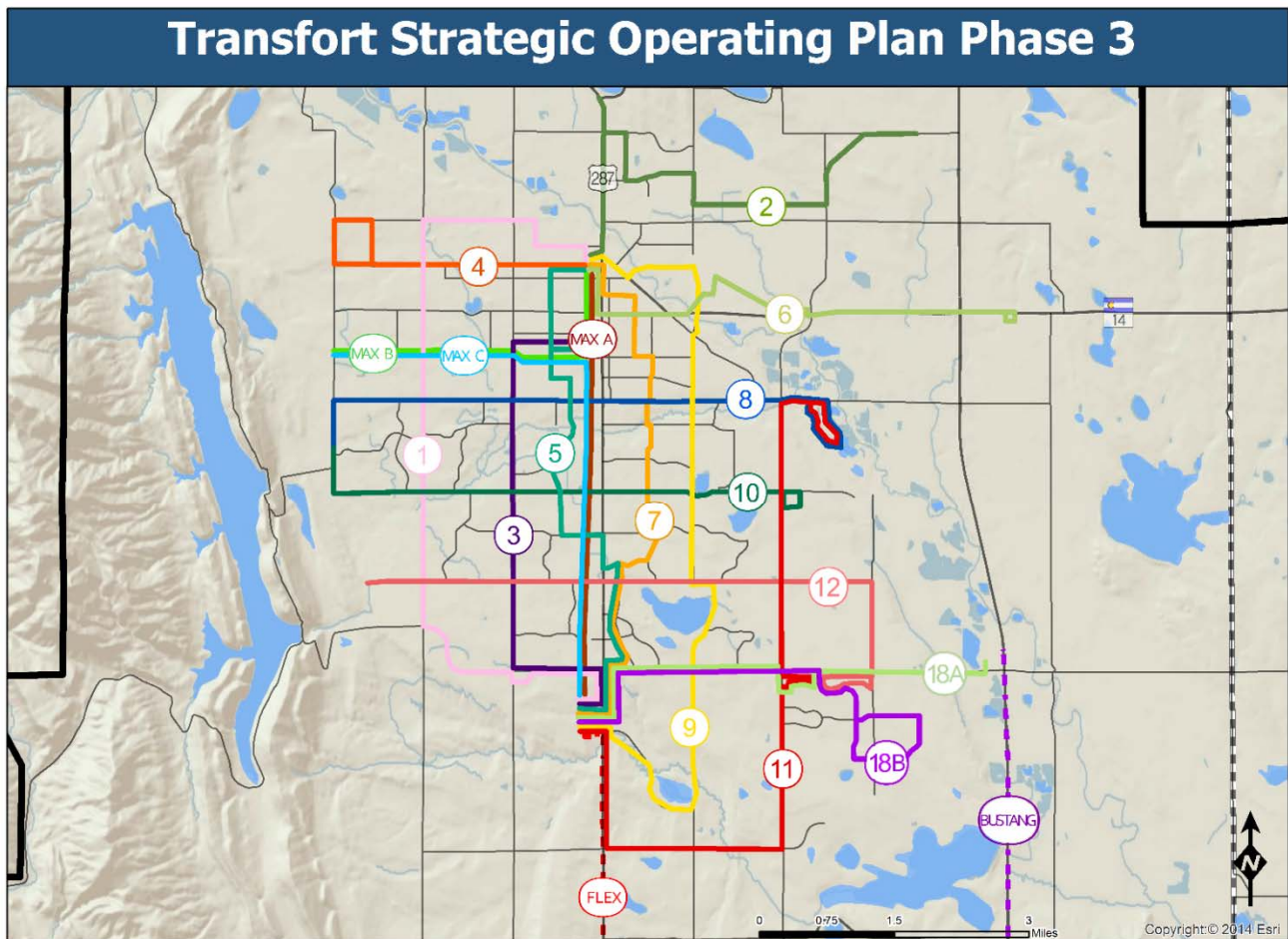
Improvement	Cost
Park and Ride Improvements	
Harmony Transfer Center Parking Garage (1 @ \$16,411/parking spot)	\$4,923,300
Centerra Parking Garage (1 @ \$16,411/parking spot)	\$4,923,300
Promontory Parking Garage (1 @ \$16,411/parking spot)	\$4,923,300
Total	\$14,769,900
Bus Shelters and Sidewalk Program	
Bus shelters (\$10,000 Average)	\$1,500,000
Sidewalks and ADA Accessible Stops	\$19,000,000
Total	\$20,500,000
Miscellaneous Programs	
Ozone Season Ride Free Program	\$5,000,000
Regional Transit App	\$1,000,000
Total	\$6,000,000
Total Cost of 2040 RTP Transit Scenario	\$153,684,429
Source: <u>NFRMO 2040 Regional Travel Demand Model</u>	

Transfort Strategic Operating Plan Phase 3

The Transit Strategic Operating Plan for the Transfort network was developed in collaboration with the City of Fort Collins - Transfort, the City of Loveland - COLT, and the Poudre School District (PSD). Currently, the model does not take into account those routes designed to serve high school or college students (Transfort Route 21, 22, 23). This is due to the RTDM representing typical regional travel patterns. These routes do not reflect this trend. The Transfort system has access to the Bustang service operated by CDOT.

Based on available funds, the Transfort Strategic Operating Plan: Phase 3 was used as the implementation routes for the Transfort System, **Figure 8-4**. This recommends additional transit growth in Fort Collins, including longer service hours and limited Sunday transit service, as well as expansion of regional service (FLEX) to Berthoud, Boulder, Denver, and Longmont. It assumes the implementation of additional Mason Express (MAX) services which extend outside the Mason Corridor and complete the transition to a full grid network in Fort Collins. For more information see the Transfort Strategic Operating Plan.⁵⁹

Figure 8-4: Transfort Strategic Operating Plan Phase 3



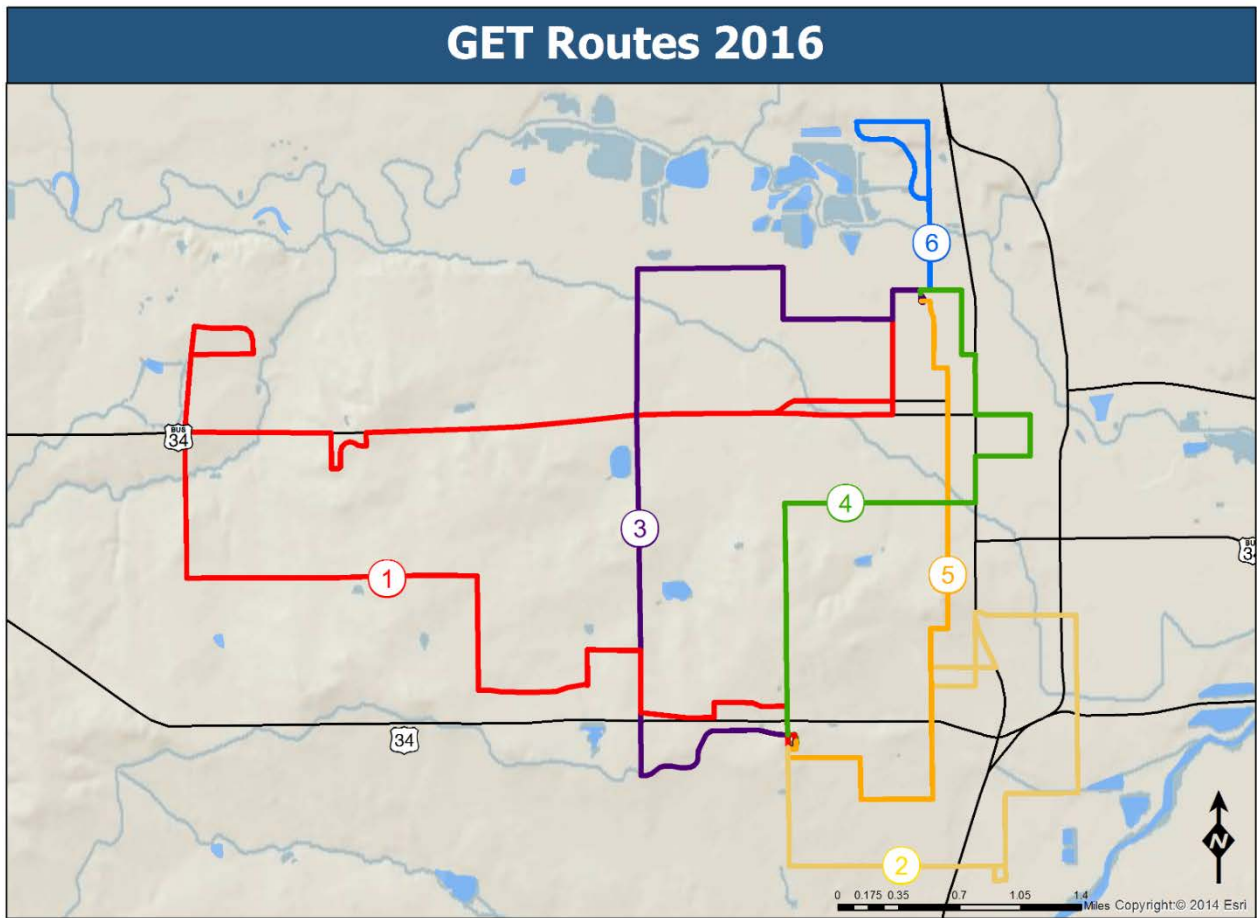
Jun, 2015
Source: CDOT, NFRMPO

⁵⁹ Transfort Strategic Operating Plan, http://www.ridetransfort.com/img/site_specific/uploads/TSP_Ch1-7.pdf, 2009

Greeley-Evans Transit Routes 2016

GET has adjusted their fixed-route services to accommodate the relocation of the downtown transfer center and to generally improve the routes by making them as reliable and efficient as possible. These new routes will begin in January 2016. The new route structure is shown in **Figure 8-5**. The changes to the system include improved connections throughout the city by increasing transfer locations and eliminating loops in favor of straight routes. For more information see *GET Proposed Route Changes*.⁶⁰

Figure 8-5: Greeley-Evans Transit (GET) Routes 2016



May, 2015

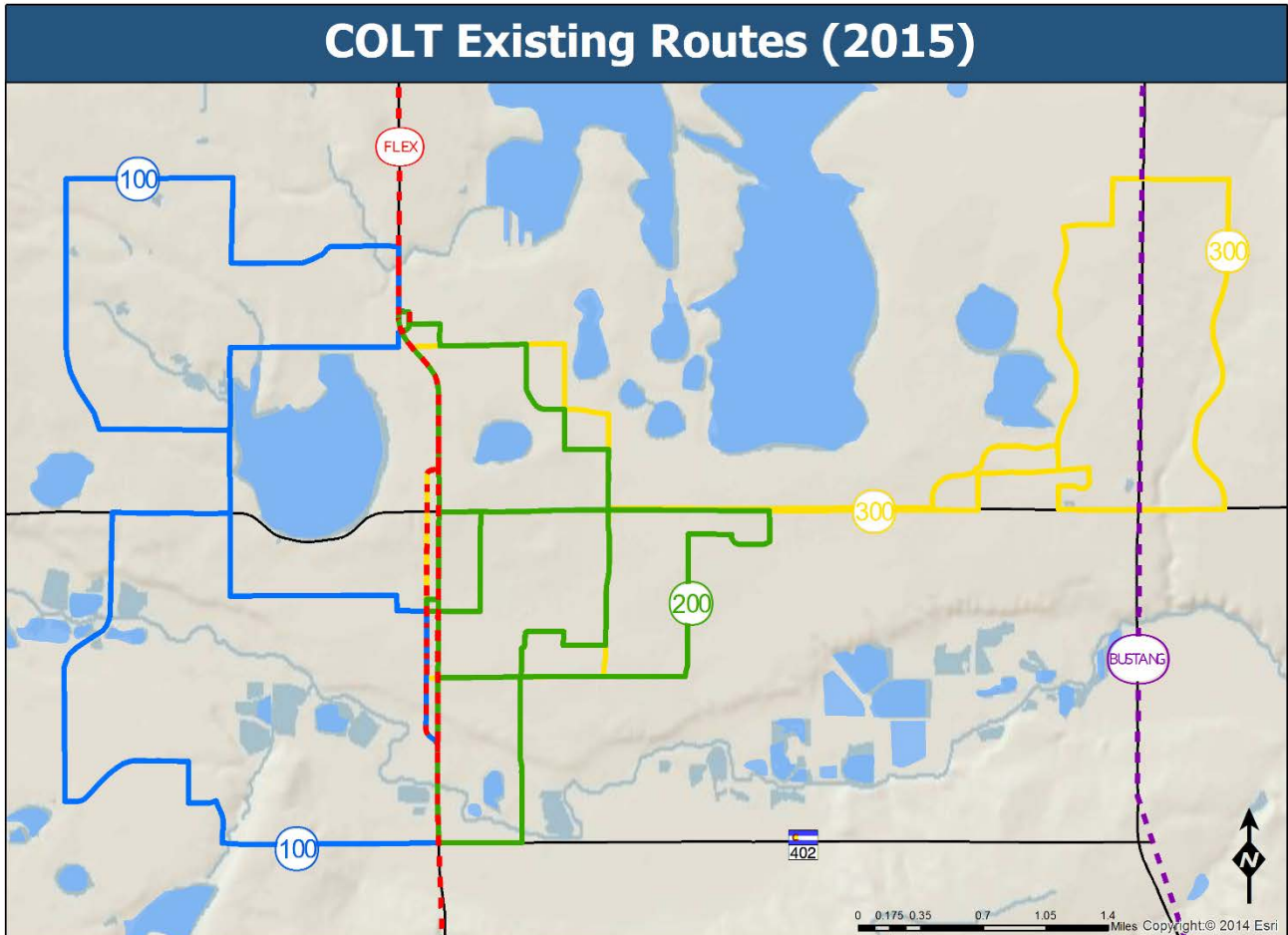
Sources: CDOT, GET

⁶⁰ Proposed Fixed Route Changes, <http://greeleygov.com/docs/default-source/Greeley-Evans-Transit/proposed-2015-route-changes.pdf?sfvrsn=2>, 2014

City of Loveland Transit Routes

COLT currently runs three routes, **Figure 8-6**. Previous updates to the routes were made in 2011, adjusting 2008 routes. Currently, there are no plans to expand or change the routes. The COLT system has access to the FLEX system and Bustang services, operated by Transfort and CDOT, respectively.

Figure 8-6: City of Loveland Transit (COLT) Existing Routes

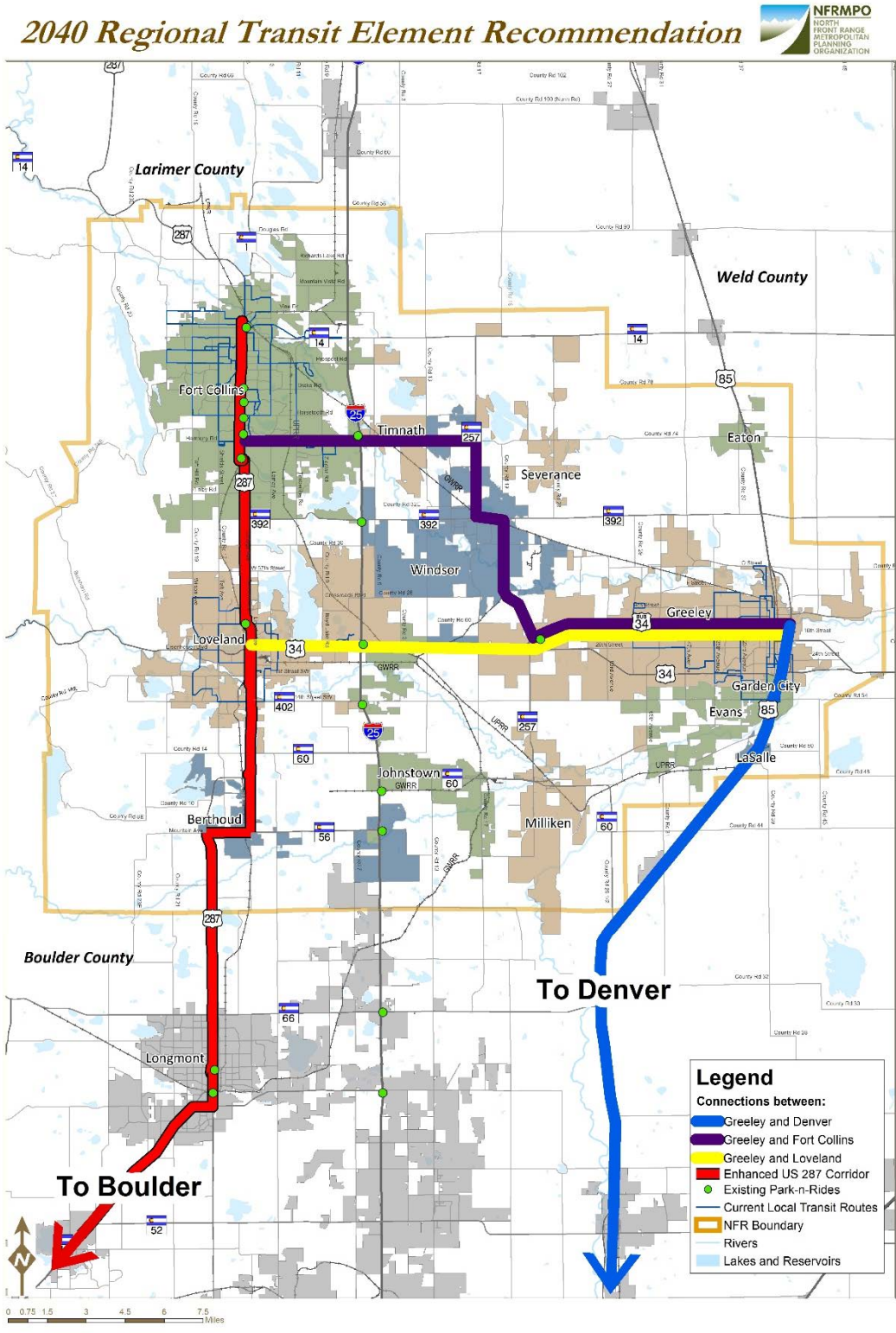


Jun, 2015
Sources: CDOT, COLT

Regional Transit Element Community Connections

The community connections selected in the 2040 Regional Transit Element (RTE) are shown in **Figure 8-7** and were used in the 2040 RTP Transit Scenario. The connection between Greeley/Evans area and Denver was not used in the scenario because more than half of the connection is outside the NFRMPO boundary. If this route is considered it will need to have a transit corridor study to accurately reflect ridership forecasts. The Greeley/Evans area and Loveland and Fort Collins and Greeley/Evans area Community Connections were used for the 2040 RTP Transit Scenario as they are completely within the NFRMPO boundary and potential ridership could be determined.

Figure 8-7: Regional Transit Element Community Connections



Ridership Results

The ridership results of the 2040 RTP Transit Scenario are detailed in **Table 8-7** for each transit agency, community connection, and the NFRMPO region as a whole. The ridership is compared to the 2040 (Build) ridership to show the impact of the improvements. This confirms, that along with scheduled improvements, local ridership has the potential to increase by 75.70 percent with an addition of 2,740 riders on community connection routes.

Table 8-9: Ridership Results		
	Ridership	Percent Increase in Ridership
2040 (Build)		
COLT	718	-
GET	1,637	-
Transfort	16,268	-
Total	18,622	-
2040 RTP Transit Scenario		
COLT	829	15.5%
GET	4,461	172.5%
Transfort	22,633	39.1%
Fort Collins and Greeley	2,274	-
Loveland and Greeley	466	-
Total	30,663	-
<i>Source: NFRMO 2040 Regional Travel Demand Model V404</i>		