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NFRMPO TECHNICAL ADVISORY COMMITTEE WORK SESSION AGENDA

**June 11, 2015
Windsor Community Recreation Center
250 N. 11th Street—Pine Room
Windsor, Colorado**

1:00 to 3:00 p.m.

1. Public Comment

DISCUSSION ITEMS:

- 2040 Regional Transportation Plan:
Chapter 8: Plan Scenarios (Pg. 4) Karasko/Horn
- 2040 Regional Transportation Plan:
Chapter 11: Congestion Management Process (Pg. 15) Karasko/Buckley
- 2040 Regional Transportation Plan All

WORK SESSION WRAP-UP:

Final Public Comment (*2 minutes each*)

**TAC MEMBERS: If you are unable to attend this meeting, please
contact Becky Karasko at (970) 416-2257 or RKarasko@nfrmpo.org.
Thank you.**

DISCUSSION ITEM: Discussion of 2040 Regional Transportation
Plan Chapters 8 and 11

AGENDA ITEM SUMMARY (AIS)

North Front Range Transportation & Air Quality Technical Advisory Committee (TAC)



Meeting Date	Agenda Item	Submitted By
June 11, 2015	Discussion of 2040 Regional Transportation Plan Chapters 8 and 11	Becky Karasko
Objective / Request Action		
Staff is providing the fourth of five groups of chapters for the 2040 Regional Transportation Plan (RTP) for TAC review and comment.		<input type="checkbox"/> Report <input checked="" type="checkbox"/> Work Session <input type="checkbox"/> Discussion <input type="checkbox"/> Action
Key Points		
<ul style="list-style-type: none"> MPO staff is developing the 2040 RTP, scheduled for September 2015 Council approval The 2040 RTP includes a long term transportation vision for the region 		
Committee Discussion		
At their February 18, 2015 meeting, TAC requested staff provide a revised schedule of when staff would require Committee review and input on the 2040 RTP chapters.		
Supporting Information		
<p>The 2040 RTP is a federally-mandated plan for MPOs and includes a long-term transportation vision for the region. The 2040 RTP summarizes the existing transportation system: roadways, transit, bicycle and pedestrian infrastructure, the environment, and includes a fiscally constrained corridor plan for the future.</p> <p>For the 2040 RTP, the Plan Scenarios include: all transportation investment from 2012 to 2040 will go into roadway capacity improvements and all transportation investment from 2012 to 2040 will go into transit including route development and equipment purchases.</p> <p>The 2015 Congestion Management Process (CMP) includes a new method to collect and show data for the Annual Report. Specifically, the MPO is moving to travel time index for the identification of congested corridors and decreasing the number of performance measures tracked from 18 to three.</p>		
Advantages		
Providing the chapters as they are drafted allows TAC to maximize their time and input in reviewing the 2040 RTP chapters. Staff will provide presentations on the changes to the RTP to summarize changes to assist TAC in their review.		
Disadvantages		
None noted.		
Analysis /Recommendation		
Staff requests TAC members review the portions of the 2040 RTP Chapters 8 and 11 applicable to their jurisdictions for accuracy and content.		
Attachments		
<p>RTP Chapters:</p> <ul style="list-style-type: none"> Chapter 8: Plan Scenarios Chapter 11: Congestion Management Process 		

Rev. 9/17/2014

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.¹ When developing scenarios, an analysis of how a scenario impacts the transportation system and performance is required. Federal Highway Administration's (FHWA) *Performance Based Planning and Programming Guidebook*² (PBPP) 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
- ▶ 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 effects 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 (MPO) 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 plan were:

1. All transportation investments from 2012 to 2040 occur on 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 MPO 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 2016-2040. STP-Metro is the most flexible funding pool the MPO receives allowing funds for most roadway, transit, and non-motorized projects. This funding pool is represented for both scenarios. CMAQ does allow certain

¹ *MAP-21 Factsheet: Metropolitan Planning*, <http://www.fhwa.dot.gov/map21/factsheets/mp.cfm>, 2012

² *Performance Based Planning and Programming Guidebook*
http://www.fhwa.dot.gov/planning/performance_based_planning/pbpp_guidebook/pbppguidebook.pdf, 2013

roadway projects but is more restrictive and does not allow the funding of capacity projects. 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

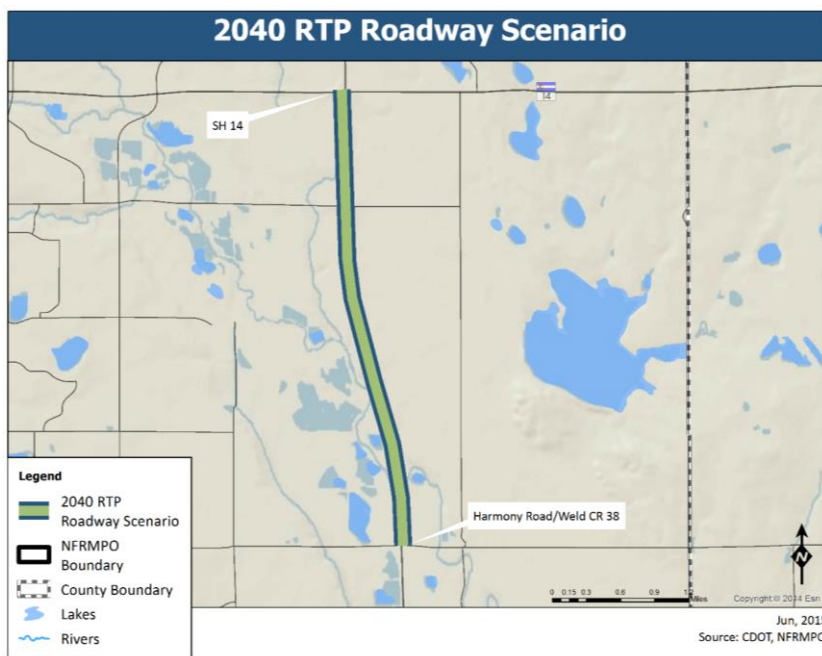
A. Roadway Scenario

The priority roadway for the NFRMPO Planning Council is I-25 due to its north-south connections serving the region. As stated in the *North I-25 EIS*, the funding begins at SH 14 on the north adding a third lane in both directions to meet the three lane section in Mead – approximately SH 66. The following defines the improvement made 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/Weld CR 38, including 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	# of Interchanges for Improvements
2040 Build Scenario	0	0
2040 RTP Roadway Scenario	8	1
*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>		

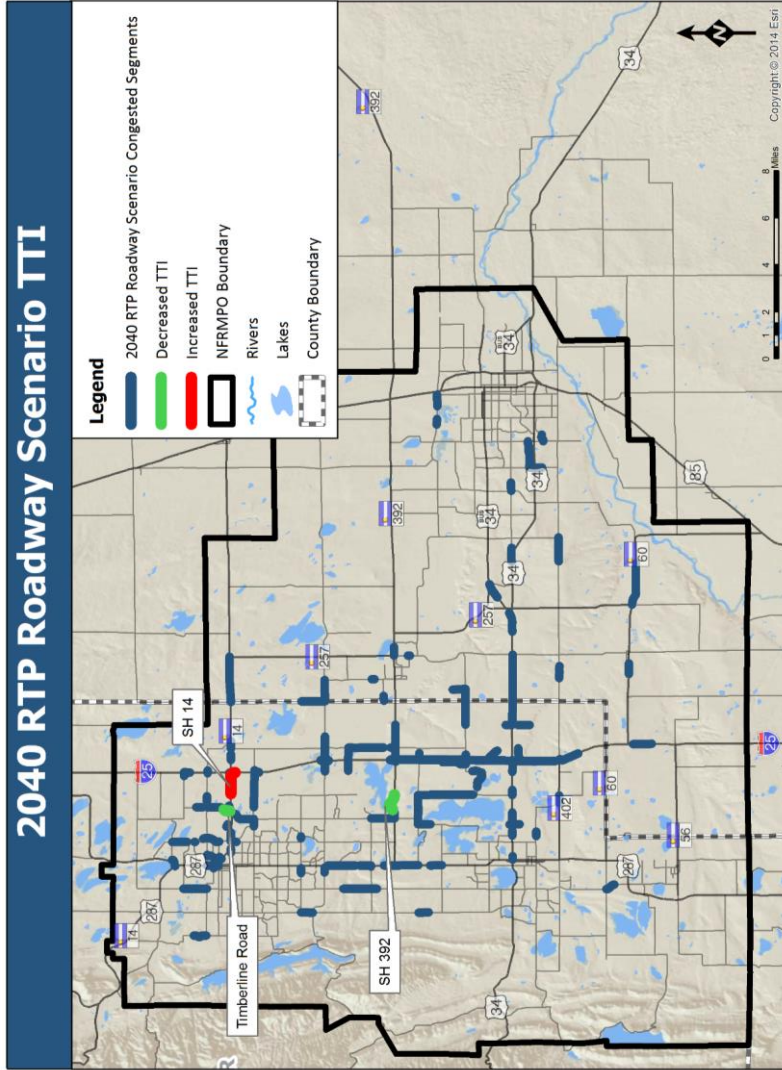
Table 8-3: VMT of 2040 RTP Roadway Scenario		
	VMT	Percent Increase in VMT
2040 Build Scenario	19,290,069	-
2040 RTP Roadway Scenario	19,290,809	0.004
Source: <i>NFRMO 2040 Regional Travel Demand Model</i>		

Table 8-4: 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. **Figures 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. **Tables 8-5** details these segments.

2040 RTP Roadway Scenario TTI



Jun, 2015
Source: CDOT, NFRMPO

Table 8-5: 2040 RTP Roadway Scenario 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	Greenfields Avenue	2.49	2.51
SH 14	Greenfields Avenue	Sherry Avenue	2.49	2.51
SH 14	Sherry Avenue	Stockton Avenue	2.49	2.51
SH 14	Stockton Avenue	Approximately I-25/SH 14 SB Ramp	2.48	2.54
SH 14	Approximately I-25/SH 14 SB Ramp	Approximately I-25/SH 14 SB 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 final 2040 RTP Roadway Scenario:

2040 RTP Roadway Analysis Scenario One: SH 14 to Trilby Road

- ▶ Widen I-25 between SH 14 and Trilby Road, including Prospect Road interchange, approximately six miles in length.

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

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

2040 RTP Roadway Analysis Scenario Three: SH 14 to CR 30

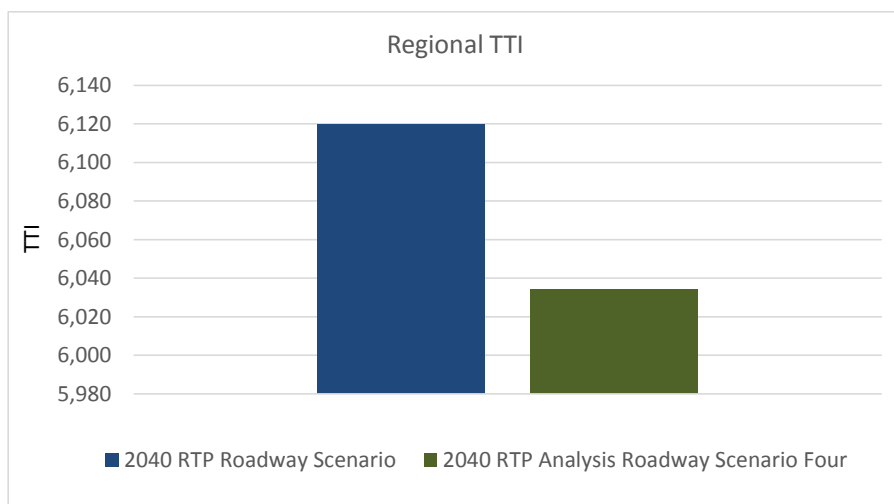
- ▶ Widen I-25 between SH 14 and CR 30, including the Prospect Road and the SH 392 interchanges, approximately eight miles in length.

2040 RTP Roadway Analysis Scenario Four: SH 14 to MPO Southern Boundary

- ▶ This scenario represents how widening improvements on I-25 would affect the transportation system. Work would need to be done on each interchange along the stretch according to Phase One of the North I-25 EIS.

The average VMT increase per-mile added is 0.001 percent between the 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 for the 2040 RTP Roadway Scenario and the 2040 RTP Roadway Analysis Scenario Four, the scenario with the most lane-miles added.

Figure 8-3 Total Travel Time 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 Regional Travel Demand Model (RTDM) was made with the socio-economic data and system-level route data when available. When unavailable, the existing route structure was used. 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 – Phase 3, increased headways include:
 - Taft Hill: 30 minute
 - East Mulberry: 30 minute
 - Lemay: 30 minute
 - Trilby/Timberline: 30 minute
- ▶ Greeley-Evans Transit (GET) – New Routes (2016), increased headways include:
 - Red Route: 60 minute
 - Blue Route: 30 minute
 - Gold Route: 30 minute
- ▶ City of Loveland Transit (COLT) – Existing Routes (2011)

Transfort Strategic Plan: Phase 3

The Transit Strategic 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. Currently, the model does not take in to

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.

Based on available funds, the Transfort Strategic Plan Phase 3 was used as the implementation routes, **Figure 8-10**. Phase 3 recommends additional transit growth in Fort Collins, including longer service hours and limited Sunday transit service, as well as expansion of regional service to Berthoud, Boulder, Denver, and Longmont. This phase 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. The following explain the changes to route types for local and regional services.

Local Services

- ▶ Proposes two new express routes utilizing the Mason Corridor to minimize transfers for high demand travel patterns and increase service frequencies along the Corridor ;
- ▶ Proposes late evening service (until midnight) for all express and MAX routes on weekdays and weekends ;
- ▶ Proposes an extended span of service with 12 routes offering early evening service and four routes offering late evening service;
- ▶ Recommends additional Saturday service;
- ▶ Recommends Sunday service;
- ▶ Includes the complete transition to a grid route configuration;
- ▶ Recommends increased service frequencies on most routes; and
- ▶ Proposes new service to the Mountain Vista area.

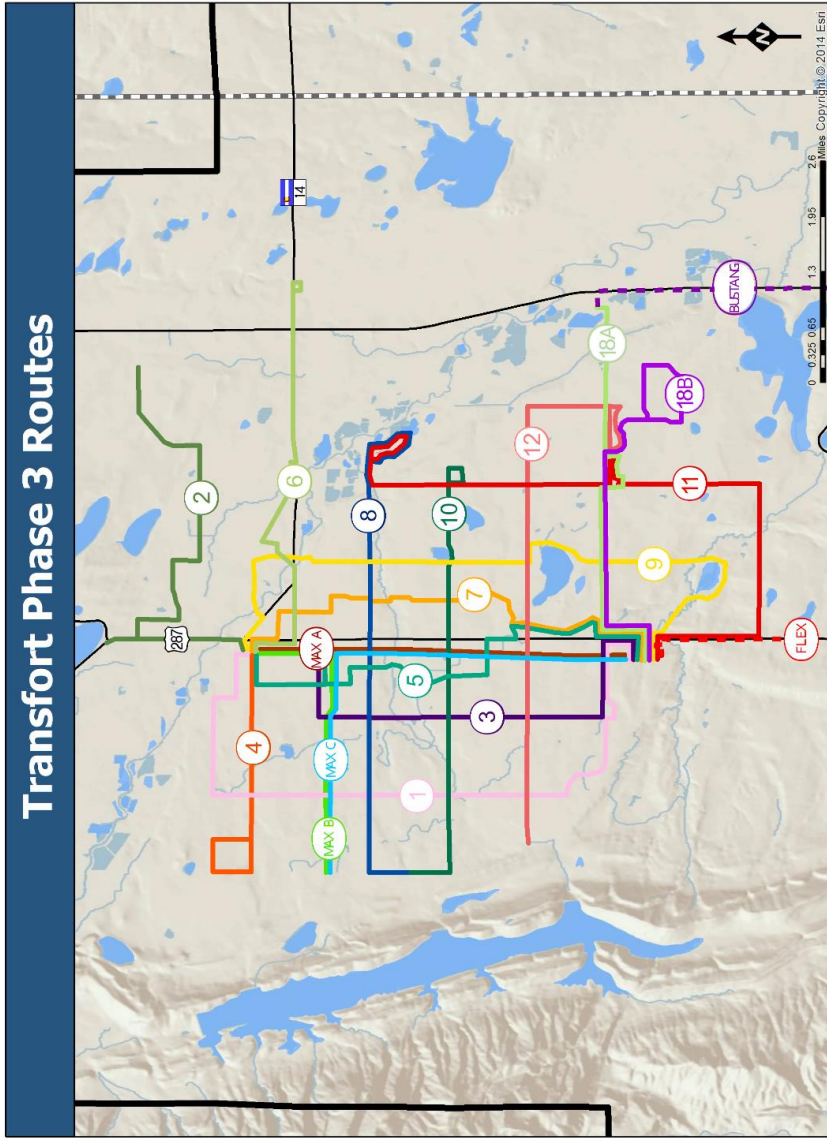
Regional Services

- ▶ Proposes a new route providing connections between south Fort Collins, Loveland (Centerra), Longmont, and Boulder with additional Saturday and Sunday service;
- ▶ Recommends reconfiguration of a regional route to provide service between Berthoud, Fort Collins, Longmont, and Loveland and introduces Sunday service; and
- ▶ Recommends additional early evening service and late evening service for regional routes.

Note: Saturday, Sunday, and extended hour service is not reflected in the 2040 RTDM.

Transfort Phase 3 Routes

Figure 8-10: Transfort Phase 3



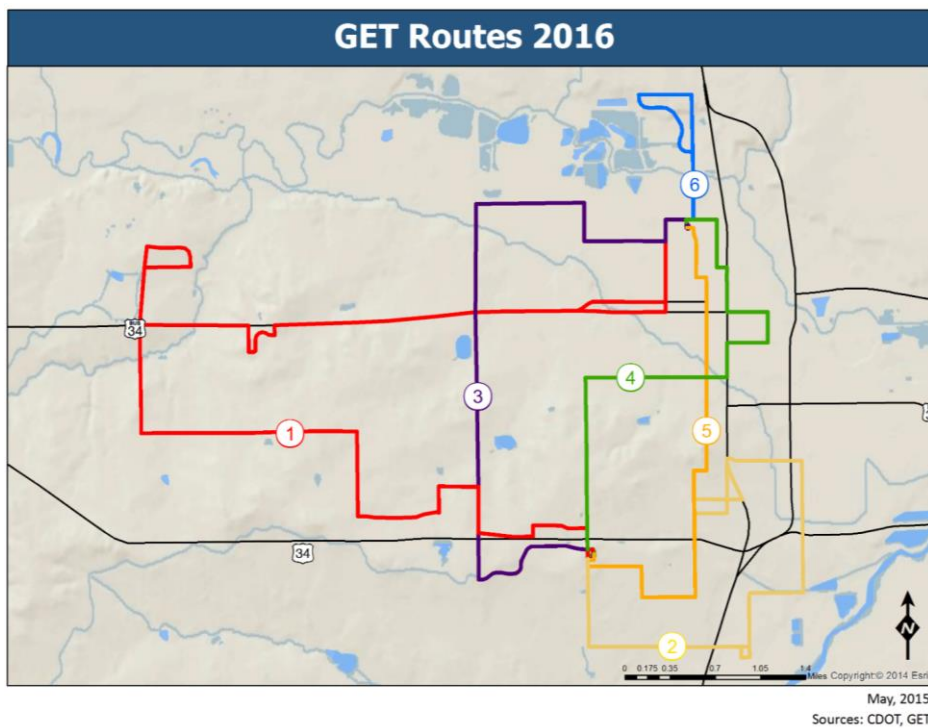
Jun, 2015
Sources: CDOT, Transfort

Greeley-Evans Transit Routes 2016

GET has adjusted their fixed-route service routes 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 8-11**. The changes to the system include:

- ▶ Route names based on a more universal numbering system rather than colors;
- ▶ A review of the current ridership, with routes serving low ridership areas eliminated and routes serving areas of high ridership maintained and improved;
- ▶ Spacing of routes no closer than ½-mile in areas that do not support high ridership;
- ▶ The elimination of loops in favor of straight routes, where an opportunity to ride is improved at no additional cost;
- ▶ Improved direct routes to and from important destinations, accomplished through a transition from a service that touches everyone’s door step to the industry standard of ¼-mile from a route being considered “well served;” and
- ▶ Improved connection throughout the city by increasing transfer locations and eliminating loops. For example between the Grove, UNC, and downtown Greeley.

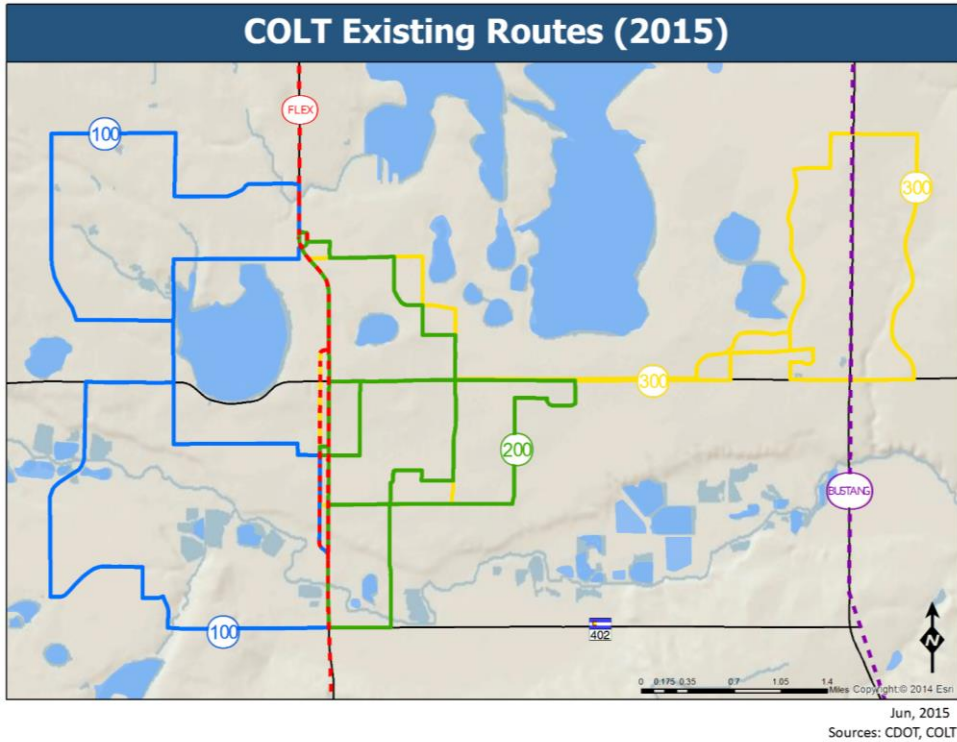
Figure 8-11: GET Transit Routes



City of Loveland Transit Routes

COLT currently runs three transit routes, **Figure 8-12**. Previously updates to the routes were made in 2011, adjusting 2008 routes. Currently, there are no plans to expand or change the routes.

Figure 8-12: COLT Routes



Ridership Results

The ridership results are detailed in **Table 8-11** for each transit agency and the region. This confirms, with scheduled improvements and increased headways ridership has the potential to increase by **XX** percent.

Commented [AH1]: Waiting on an analysis of the transit network from Sean (modeler).

Table 8-11: Ridership Results			
	Ridership	Percent Increase in Ridership	Percent Increase in Ridership per year
2040 (Build)			
COLT		-	-
GET		-	-
Transfort		-	-
Total		-	-
Scenario 1			
COLT			
GET			
Transfort			
Total			

Source: NFRMO 2040 Regional Travel Demand Model

Analysis Scenarios

The following 2040 RTP Transit Analysis Scenarios were run to identify the 2040 RTP Transit Scenario:

2040 RTP Transit Analysis Scenario One

- ▶ Transfort – Phase 3
- ▶ Greeley-Evans Transit (GET) – New Routes (2016)
- ▶ City of Loveland Transit (COLT) – Existing Routes (2011)

2040 RTP Transit Analysis Scenario Two

- ▶ Transfort – Phase 3
- ▶ GET – New Routes (2016), increased headways include:
 - Red Route: 20 minute
 - Purple Route: 30 minute
 - Gold Route: 30 minute
 - Green Route: 30 minute
- ▶ COLT – Existing Routes (2011)
 - Gold Route: 30 minute

2040 RTP Transit Scenario Three

- ▶ Transfort – Phase 3
- ▶ GET – New Routes (2016), increased headways include:
 - Red Route: 60 minute
 - Blue Route: 30 minute
 - Gold Route: 30 minute
- ▶ COLT – Existing Routes (2011) and reverse of routes for additional service

The analysis scenarios have an average ridership increase of ~~XX~~ percent from 2040 RTP Transit Analysis Scenario One through Three.

Commented [AH2]: Waiting on an analysis of the transit network from Sean (modeler).

Chapter 11: Congestion Management Process

A. Introduction

New residents are moving into the North Front Range region every day. Offering travelers' safe, convenient transportation alternatives can reduce vehicular congestion on the regional road system. The NFRMPO's Congestion Management Process (CMP) creates an objectives driven, performance-based plan to reduce regional congestion.

Now, more than ever, residents of the North Front Range region are incorporating walking, bicycling, and transit in their daily commutes. Intelligent Transportation Systems (ITS) and Travel Demand Management (TDM) principles are reducing regional congestion by increasing efficiency and highlighting new mode choices.

In the sections that follow, the steps to create a CMP are outlined. Consistent, ongoing data collection efforts will supply information for annual CMP reporting. The goal of CMP reporting is to create an objectives driven, performance-based CMP incorporating all modes and users.

B. Background

Purpose of the CMP

The purpose of a CMP is to collect congestion data, develop performance measures, and direct funding toward projects and strategies that most effectively address congestion. The [2015 CMP Report](#) augments existing plans in the metropolitan transportation planning process, while annual CMP reports track transportation system performance.

Federal requirements state regions with a population over 200,000 in urbanized areas (UZAs), also known as Transportation Management Areas (TMAs), must maintain a CMP and use it to make informed transportation planning decisions. The [2015 CMP Report](#) identifies congested Regionally Significant Corridors (RSCs), develops strategies to mitigate the congestion, and provides a way to monitor the effectiveness of the strategies.

Requirements for a CMP

The current funding authorization bill, MAP-21 requires consideration first be given to strategies which reduce single-occupant vehicle (SOV) travel and improve the efficiency of the existing transportation system. All reasonable strategies must be analyzed before a capacity increasing improvement is proposed as a congestion management technique.

Federal regulations (23 CFR Part 450.320) specify an effective CMP should include:

- ▶ Methods to monitor and evaluate the performance of the multi-modal transportation system, identify the causes of recurring and nonrecurring congestion, identify and evaluate alternative strategies,

provide information supporting the implementation of actions, and evaluate the efficiency and effectiveness of implemented actions;

- ▶ Defined objectives and performance measures to assess congestion and evaluate congestion reduction and mobility enhancement strategy effectiveness;
- ▶ Establish a data collection and system performance monitoring program that defines the extent and causes of congestion, determines the causes of congestion, and evaluates the efficiency and effectiveness of implemented actions;
- ▶ Identifies and evaluates the anticipated performance and benefits of both traditional and non-traditional congestion management strategies;
- ▶ Identifies an implementation schedule, responsibilities, and potential funding sources for each strategy; and
- ▶ Identifies a process for periodic assessment of the efficiency and effectiveness of implemented strategies.

MAP-21 legislation requires performance measures, targets, plans, and reporting. This performance and outcome-based program ensures states invest resources in projects that collectively make progress toward the achievement of national goals. The legislation outlines seven national goal performance areas, highlighted in

Table 11-1 MAP-21 Seven National Performance Areas	
Goal Area	National Goal
Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
Infrastructure Condition	To maintain the highway infrastructure asset system in a state of good repair
Congestion Reduction	To achieve a significant reduction in congestion on the National Highway System
System Reliability	To improve the efficiency of the surface transportation system
Freight Movement and Economic Vitality	To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
Environmental Sustainability	To enhance the performance of the transportation system while protecting and enhancing the natural environment
Reduced Project Delivery Delays	To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices

Source: FHWA MAP-21 Performance Management¹

Three of the national goals directly pertain to the CMP: Congestion Reduction, System Reliability, and Freight Movement and Economic Vitality. **Section D** of this chapter discusses strategies to alleviate congestion.

History of the NFRMPO CMP

Originally, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) introduced the concept of Congestion Management Systems (CMS). The CMS was created to collect congestion data, enhance the tools for data management and modeling, expand the use of intelligent transportation systems, and encourage regional cooperation and coordination.

Subsequently, the Safe Accountable Flexible Efficient Transportation Equity Act - A Legacy for the Users (SAFETEA-LU) continued this effort by requiring the use of a Congestion Management Process in TMAs. The current federal transportation bill, MAP-21 maintains the CMP requirement, but requires enhanced monitoring, reporting of congestion, reliability, and formalized performance measures.

The NFRMPO was designated as a TMA in 2002, following the 2000 US Census. In 2004, FHWA accepted a Congestion Management Framework in lieu of a Congestion Management System, given the short timeframe between the NFRMPO's TMA designation and the publication of the 2030 Regional Transportation Plan (RTP). In 2007, the NFRMPO expanded the framework into a full CMP and integrated it with the 2035 RTP.

During the development of the 2010 CMP and 2035 RTP in 2007, the NFRMPO TAC and Planning Council identified the Tier One RSCs to be the focus of the CMP in the North Front Range. Tier One corridors included I-25, US 34, US 287, and their parallel facilities although data was collected on only the main corridor. For the 2040 RTP, the MPO has moved away from tiers to individual corridors. All congested roadway RSCs are included in the 2015 CMP data collection and analysis. The RSCs can be found in **Table 2-1** in Chapter 2.

The 2010 CMP concluded with two possible modifications to the CMP in the future, including:

- ▶ Update the identification of currently congested corridors based on actual data collected through the region-wide data collection program, rather than using travel demand model results.
- ▶ Reconsider the network for which the CMP applies; the CMP may not be as appropriate to rural portions of the Tier One corridors as the portions that are in urban areas.

¹ US Department of Transportation. Federal Highway Administration. MAP-21 – Moving Ahead for Progress in the 21st Century. Performance Management. <http://www.fhwa.dot.gov/map21/factsheets/pm.cfm> Accessed 5/8/15.

Over last year, MPO members have begun collecting real-time travel data in the region (**Section C**). As the data accumulates, longitudinal studies will be possible. In the interim, the NFRMPO's Regional Travel Demand Model will be used to identify corridors to deploy data collection devices along with local expertise.

Vision, Goals, and Objectives of the Congestion Management Process

The vision statement for the 2015 CMP Report is:

The North Front Range Metropolitan Planning Organization strives to objectively reduce congestion on regionally significant corridors for all modes and all users using TDM strategies.

The CMP Goals and Objectives to support this vision include:

Goal 1: Improve Efficiency

Objective: Reduce congestion with cost-effective, non-roadway-widening solutions that use technology to the best advantage, such as traffic management, TDM, and ITS.

Goal 2: Increase Mobility

Objective: Make non-SOV transportation modes (walking, bicycling, transit, carpooling, vanpooling) more available, convenient, safe, and attractive for everyone.

Goal 3: Improve Safety

Objective: Reduce crashes for all modes, focusing especially on improving safety for pedestrians and bicyclists and on reducing the number of incident-related crashes.

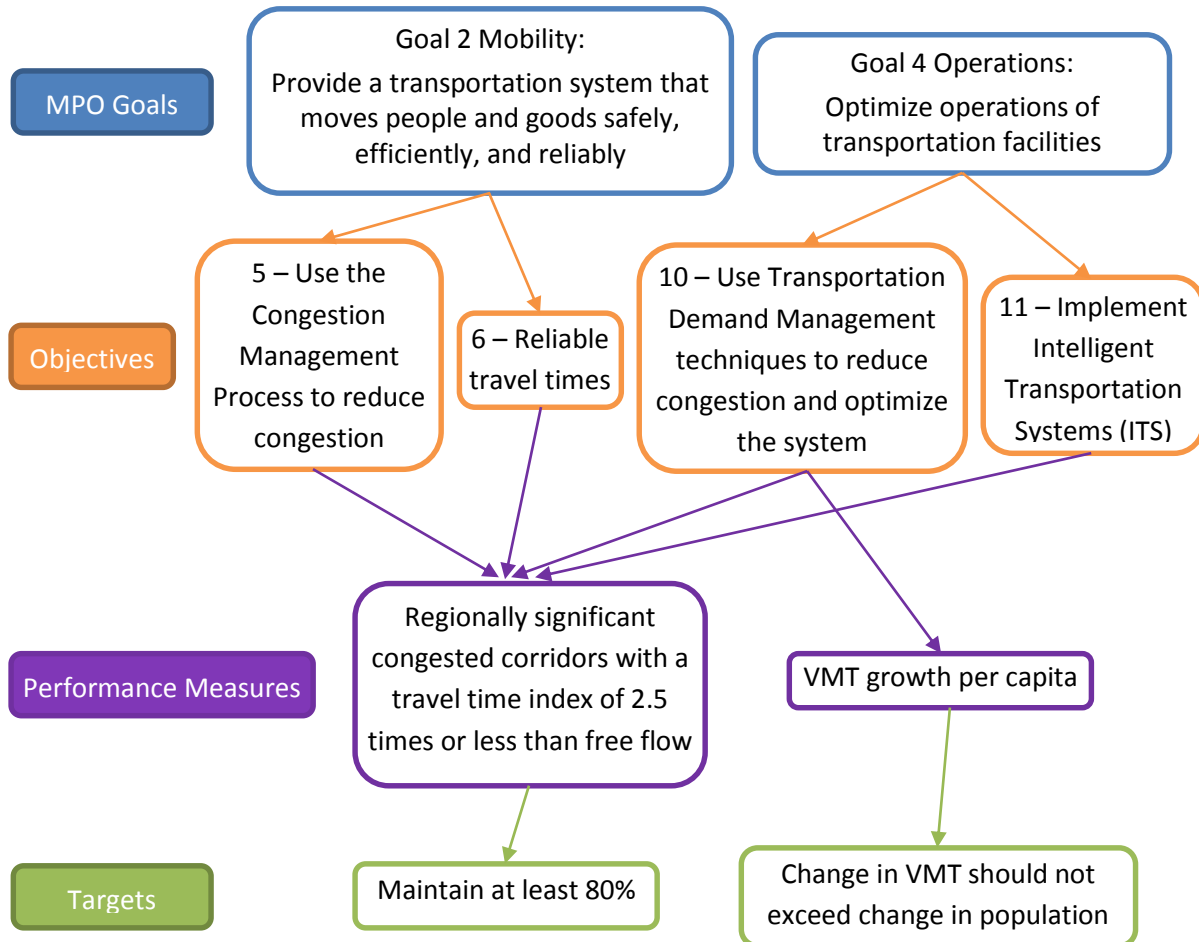
Goal 4: Increase Reliability

Objective: Increase travel time reliability for all modes and users while reducing user exposure to traffic incidents, crashes, and work zones. ²

² Boston Region MPO Congestion Management Process. 2013. Chapter 1. <http://www.ctps.org/Drupal/cmp>

From the 2040 RTP adopted Goals, Objectives, Performance Measures, and Targets (GOPMT) outlined in **Chapter 4**, two performance measures are specific to the CMP, as shown in Figure 11-1.

Figure 11-1: 2040 RTP – CMP Specific Goals, Objectives, Performance Measures, and Targets



The performance measures in this 2040 RTP GOPMTs match the CMP objectives. To help complete the picture of regional congestion transit performance measures have been selected and are detailed in **Section D**.

Integration in the Planning Process

The CMP has the potential to create an efficient transportation system, increase mobility, and maximize the utility of limited resources. It enables the MPO to measure system performance in a systematic manner. The CMP is tied to the federally required RTP and helps to inform the NFRMPO TIP.

While the RTP provides a vision for transportation planning in the North Front Range region, the TIP provides for the programming of funding for regional transportation projects. The CMP has the ability to offer data to craft a

vision for the future and inform individual projects. Furthermore, corridor studies, transit efficiency, and non-motorized projects benefit from data collected through the CMP.

C. Quantifying Congestion

Often, sources of congestion occur together. Weather events can easily create unsafe driving situations resulting in crashes. Special events can cause drivers to avoid certain areas resulting in congestion along a less traveled corridor. A lack of parallel facilities and a lack of transportation options for pedestrians, bicyclists, and transit users can result in high levels of unrestrained SOV demand.

Congestion

There are two types of congestion: recurring and non-recurring.

Recurring congestion includes:

- ▶ Ineffective management of capacity
 - Operations – Inefficient signal timing and progression and/or lack of auxiliary lanes.
 - A lack of TDM techniques such as carpool/vanpool programs or congestion pricing.
- ▶ Insufficient capacity
 - Lack of Parallel Facilities
 - Roadway Capacity
- ▶ Unrestrained demand
 - Lack of Other Modes
 - Land Use

Non-recurring congestion:

- ▶ Temporary events
 - Traffic Incidents - Crashes, traffic stops, or breakdowns
 - Weather Events
 - Special Events
 - Work Zones
 - Emergencies

Seven causes of congestion:

1. *Physical bottlenecks*
 2. *Traffic incidents*
 3. *Work zones*
 4. *Weather*
 5. *Traffic control devices*
 6. *Special events*
 7. *Fluctuations in normal traffic*
-

Congestion management is the “application of strategies to improve transportation system performance and reliability by reducing the adverse impacts of congestion on the movement of people and goods.”³

Regionally Significant Corridors

Previously, the CMP only focused on the Tier 1 RSCs, but the scope has expanded to include all congested RSCs. The RSC designation allows the MPO to maximize the use of limited transportation funding. Information about RSC location can be found in **Chapter 2**. Information about congested RSCs can be found in **Chapter 7**.

Congestion Management Data Sources

Regional Travel Demand Model

The MPO and member jurisdictions use the 2040 NFRMPO Regional Travel Demand Model as a tool to forecast traffic and travel demand in communities throughout the model area. The primary purpose of the travel model is to support the RTP and air quality conformity analysis, but the information can be helpful for the CMP as well. The model can help to evaluate proposed roadway projects, potential impacts of proposed development projects, and various transportation studies of the region, subareas, and corridors.

The model helps identify which roadway links are currently congested and those with the potential to be congested by calculating free flow speed, travel time, and capacity. This information is then used to see if congestion management performance measures are being met. This helps project sponsors and stakeholders select projects that relieve congestion in the region. The model is regularly updated by the MPO to reflect current conditions using the most recent available data. Until the Bluetooth counters are operational, the Travel Demand Model will be used to generate maps to highlight congested areas in the region.

FHWA National Performance Measurement Research Data Set

The National Performance Measurement Research Data Set (NPMRDS) is a historical archive of average travel times by calendar day, in five minute increments, covering the NHS. FHWA has purchased HERE North America, LLC (formerly Nokia/NAVTEQ) travel time data for DOT and MPO use. The regional NPMRDS coverage is highlighted in **Figure 11-2**.

Three categories of travel time data are collected: passenger vehicles, freight vehicles, and a category with both groups combined. No modeling or historical data is applied if probe data does not exist for a particular epoch and no record is provided. Some outliers are included in the dataset, but clearly invalid probe data are discarded. Invalid probe data includes zero-speed vehicles, off-road vehicles, and vehicle headings that do not correspond with existing corridors.

³ Congestion Management Process: A Guidebook. U.S. Department of Transportation, Federal Highway Administration. April 2011. Pg. 1.

The data for personal vehicles is gathered from multiple sources including: mobile phones, vehicles, and personal navigation devices. Data for freight vehicles is gathered by the American Transportation Research Institute (ATRI) and is sourced from Class 7 and 8 trucks.

Archived datasets include only Interstates for the period of October 2011 to June 2013. Monthly datasets began in July 2013, in 5 minute increments for the entire NHS.

The datasets are broken down by Transportation Management Center (TMC), an industry standard referencing system streets, segments, and roads typically from intersection to intersection.

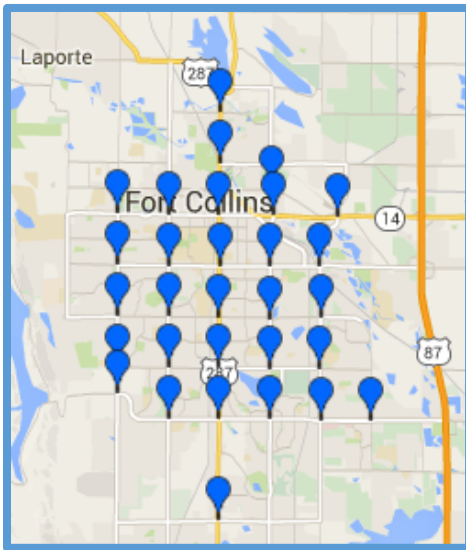
INRIX Travel Time and Volume Data Set

In the near future the NFRMPO will have access to INRIX travel time and volume datasets in addition to the FHWA HERE dataset. INRIX travel time data is collected through GPS enabled devices including cell phones and connected cars, trucks, and fleet vehicles. Additional variables affecting traffic including weather conditions, special events, schools schedules, and road construction are factored into the traffic datasets. As the dataset becomes available MPO staff will analyze and incorporate useful data in the CMP.

Class 7 trucks have a gross vehicle weight rating (GVWR) between 26,001 – 33,000 lbs.

Class 8 trucks 33,001 lbs. or above. Both Classes require a Class B license to operate in the US.

Figure 11-3: Fort Collins Bluetooth Counter Locations



Fort Collins Bluetooth Dataset

In June 2014, the City of Fort Collins, Division of Traffic Operations began installing a series of 30 Bluetooth traffic counters at major intersections across the City (**Figure 11-3**). The Fort Collins Bluetooth counters are also highlighted in **Figure 11-2** with the NPMRDS.

Operational since October 2014, these counters wirelessly connect to cell phones, headsets, music players, and navigation systems using Media Access Control (MAC) protocols. Unique identifiers from these devices are not associated with any specific user or account, eliminating any ability to gather private information.

City of Loveland, City of Greeley, and CDOT Bluetooth Counters

Currently, the City of Loveland, the City of Greeley, and CDOT are in the process of researching Bluetooth counters for intersections in their communities or region. To create a robust regional dataset the MPO will be assisting with the purchase of counters for CDOT and the cities

of Fort Collins, Loveland, and Greeley. Counter purchasing should begin in summer 2015, with counters coming online by late 2015. A substantial portion of the regional transportation network is expected to be covered by 2017.

NFRMPO Congestion Survey

In 2014, the MPO conducted a regional congestion survey. The purpose of the survey was to better understand the community's perspective of transportation congestion. The 12 question survey had approximately 200 respondents from the 15 MPO member communities. The majority of respondents lived in Fort Collins (42 percent) and an even larger group worked in Fort Collins (71 percent). Almost 86 percent of respondents drive alone as their primary commute method. However nearly nine percent chose a bicycle for transportation.

The complete list of survey questions can be found in **Appendix XXX**

D. Strategies to Alleviate Congestion

Congestion Performance Measures

The focus of the 2015 CMP is the effective movement of people and goods. Throughout a normal day, congestion can occur for all users and all modes in the region. The 2015 CMP Report performance measures reflect this reality by offering quantifiable measures for all users and all modes.

outlines CMP performance measures the MPO will report in the Annual CMP Report.

Table 11-2: Implemented Congestion Performance Measures	
CMP Performance Measures	Description
Travel Time Index*	Ratio of average peak travel time to an off-peak (free-flow) standard. A value of 1.25 indicates that the average peak travel time is 25% longer than off peak travel times.
Vehicle Miles Traveled (VMT)*	Measurement of miles traveled by vehicles in a specified region over a specified time period. Calculated per person for all trips or for specific destinations including home, work, commercial, etc. A reduction in VMT can be used to show environmental benefits. Modeling VMT requires estimates of trip generation and trip length. Land use planning principles such as infill development can help reduce VMT. Using VMT a fuel use measurement can be derived.
Transit Performance Measures	On Time Performance – Percentage of time a bus or train remains on published schedule. Passengers per Hour per Direction indicates travel patterns and system capacity. Passengers per Mile per Gallon is a measure of transit system use and fuel efficiency.

*These performance measure are from the NFRMPO 2040 RTP GOPMT. The Transit performance measures are specific to the 2015 CMP Report.

The Travel Time Index and Transit Performance Measures are explained in greater detail in the following sections.

Travel Time Index

Currently, the MPO is transitioning from volume over capacity (V/C) congestion (2010 CMP) measurements to Travel Time Index (TTI) as a primary measure of regional congestion. The MPO estimated TTI information using the NFRMPO’s Regional Travel Demand Model.⁴ TTI is defined as:

The ratio of the travel time during the peak period to the time required to make the same trip at free-flow speeds. A value of 1.3, for example, indicates a 20-minute free-flow trip requires 26 minutes during the peak period.⁵

Maps of the 2012 regional TTI and 2040 regional TTI can be found in **Chapter 7**.

Over the next two years, the MPO will transition to the collection and use of TTI information from the FHWA HERE dataset, INRIX dataset, and Bluetooth counters discussed in **Section C**. In the future, posted speed limits will be used as the baseline for free-flow travel time.

⁴ North Front Range 2012 Base Year Regional Travel Model Technical Documentation. 2015.

<http://nfrmpo.org/ResourcesDocuments/2040RTP.aspx>

⁵ Glossary of Mobility-Related Terms. Texas A&M Transportation Institute. Urban Mobility Information. Accessed 5/21/15.

<http://mobility.tamu.edu/ums/media-information/glossary/>

Transit Performance Measures

Future CMP reporting will use three performance measures for transit including:

- ▶ **On Time Performance:** The percentage of time a bus remains on its published schedule. This performance metric indicates the ability for the traveling public to rely on posted times.
- ▶ **Passengers per Mile per Gallon:** Requires the calculation of a Passengers per Mile metric and a vehicle mile per gallon figure. Subsequently, the number of Passengers per Mile is multiplied by the vehicle's mile per gallon figure resulting in a figure that can be compared to other vehicles.
- ▶ **Passengers per Hour per Direction:** Requires the number of Passengers per Hour multiplied by a directional coefficient, unless it is collected immediately with the passenger boarding/exiting. The resulting figure is useful when examining travel patterns.

Transportation Demand Management (TDM)

The NFRMPO completed the Long Range Transportation Demand Management Plan in December 2010. TDM are actions that improve the efficiency of the transportation system by altering transportation system demand rather than embarking on roadway capacity expansion projects. TDM is about increasing transportation system carrying capacity through operational efficiencies or reducing demand.

Intent and Methods of Transportation Demand Management

Federal regulations specify all reasonable congestion management strategies must be evaluated and deemed ineffective or infeasible prior to the consideration of a roadway capacity increase as a congestion management approach. A common misconception of TDM is that it is focused strictly on "getting people out of their cars." Rather there are many ways to improve the efficiency of the existing transportation network.

Transportation Demand Management Strategies

TDM strategies can use voluntary or mandatory mechanisms to reduce demand. Eight common TDM strategies include:

- ▶ **Road Pricing:** Programs which charge drivers based on their usage of the roadway. Congestion pricing includes price variations based on time of day and level of congestion.
- ▶ **Parking Management and Parking Pricing:** Parking Management includes time of day restrictions such as before 10 am or allows the price for parking to fluctuate to ensure a certain percentage of parking spaces are vacant. Parking Pricing is the price associated with the use of a parking space.
- ▶ **Car Sharing:** Participants pay to rent vehicles on a per-trip basis allowing the costs of operating a vehicle to be spread among many users.
- ▶ **Pay-as-You-Drive Insurance:** Vehicle insurance premiums vary according to the number of miles driven. This gives drivers who drive less an opportunity to pay a lower variable cost rather than a higher, fixed cost insurance.
- ▶ **Ridesharing and HOV Lanes:** Ridesharing is two or more people traveling in a vehicle to their destination. HOV lanes incentivize ridesharing by offering travelers who rideshare a less congested travel lane, preferred parking, etc.

- ▶ **Transit Incentives:** Businesses or other organizations can offer reduced or free fares to incentivize the use of transit for employees.
- ▶ **Transit Improvements:** Improving the availability, efficiency, reliability, convenience, and comfort of transit incentivizes traveler’s use of the network.
- ▶ **Telework:** Working from home reduces the frequency of employees needing to commute to an employment location.⁶

Additional TDM measures were recommended by the MPO in the Long Range Transportation Demand Management Plan, including:

- ▶ **TDM Workshops:** Targeted to employees, a workshop would highlight TDM practices an employer could use to encourage healthy, safe, effective transportation practices.
- ▶ **Guaranteed Ride Home:** Used to supplement an employee’s mode choice, the Guaranteed Ride Home service provides a free or inexpensive taxi for emergencies for those employees who rideshare.
- ▶ **Employer Transportation Assessment Program:** The NFRMPO staff assist local businesses in the creation of a TDM policy for employees.
- ▶ **ITS Improvements:** Covered in **Section D** of this chapter.

Transportation Demand Management in Northern Colorado

VanGo™ is a division of the NFRMPO with the goal of helping residents in the region travel as often as possible by means other than driving alone in a car. The program has a website called SMARTTRIPS™ that encourages regional transportation users to choose bicycling, transit, carpooling, vanpooling, and walking to reach their destination. Two of the main SmartTrips™ options on the website are VanGo™, a vanpool service which operates 70 vans, and CarGo™, an online ride-matching service allowing users to create their own carpools. Two NFRMPO employees run the program with administrative support from the MPO. The program benefits residents in the region by saving them time and money while reducing regional congestion, emissions, and fuel use.

Local governments and CDOT participate in regional TDM efforts. The following list describes efforts to implement TDM.

- ▶ Fort Collins:
 - Transfort offers bus transit service Monday through Saturday. To increase multi-modal transportation opportunities, all buses are equipped with bicycle racks. CSU students ride Transfort for free, after paying tuition and associated fees. Transfort offers Passfort, an employer-based bus pass program which allows the bulk purchase of bus passes. FLEX is a

⁶ Reference Sourcebook for Reducing Greenhouse Gas Emissions from Transportation Sources. Chapter 5 Transportation Demand Management Strategies. U.S. Department of Transportation, Federal Highway Administration. Updated 3/24/15. http://www.fhwa.dot.gov/environment/climate_change/mitigation/publications_and_tools/reference_sourcebook/page05.cfm#s1

regional bus service operated by Transfort and offers service to Loveland, Berthoud, and Longmont. MAX is a BRT service operated by Transfort offering north/south service along the Mason Street corridor which parallels College Avenue/US 287.

- FCTrip is a web-based application that provides real-time information to travelers in Fort Collins. This information is supplied through a network of closed-circuit television cameras, video detectors, and pavement sensors.
- Traffic Signal Timing adjustments offer travelers decreased travel delay and increased fuel savings while providing increased pedestrian clearance intervals.
- Fort Collins Bike Library offers community members, students, and visitors a free bicycle to ride if it is returned at the same location, during business hours, on the same day. Each additional day is a nominal fee. The City of Fort Collins sponsors an annual Bike to Work Day event which challenges both employees and local businesses to promote bicycling as transportation for employees.
- Climatewise is a free, voluntary City of Fort Collins program that assists local businesses and the environment through the promotion of waste reduction, energy savings, alternative transportation, water conservation, and practicing pollution prevention.
- CSU incorporates TDM practices by offering a Fort Collins Bicycle Library location on campus, and free Transfort transit passes.

▶ City of Loveland:

- COLT provides fixed-route bus transit Monday through Saturday, with connections to the FLEX service.
- The City of Loveland sponsors an annual Bike to Work Day event which challenges both employees and local businesses to promote bicycling as transportation for employees.
- The City of Loveland's Engineering Department has partnered with the Thompson School District to promote a Safe Routes to School Program.

▶ City of Greeley:

- The City of Greeley operates GET which provides local transit service in Greeley, Garden City, and Evans.
- Students at the University of Northern Colorado (UNC) ride GET free of charge with student ID cards. Greeley elementary and secondary students also ride free with a pass.
- UNC operates a free vanpool for faculty and staff.

▶ City of Berthoud:

- The City of Berthoud operates the BATS demand-response transit service Monday through Friday, 8:00 am – 4:00 pm.

- The system operates five vehicles and offers service within Berthoud, to Loveland, and to Longmont.
- ▶ **CDOT:**
 - Sponsors Bustang which is an interregional express bus service for long distance commutes to Denver along the I-25 and I-70 corridors.
 - Connects commuters to the north in Fort Collins and Loveland and to the south in Monument, Woodmen, Colorado Springs and Tejon using I-25.
 - Connects commuters to the east in Glenwood, Eagle, Vail, Frisco, and the Denver Federal Center using I-70.

Intelligent Transportation System

An Intelligent Transportation System (ITS) improves transportation safety and mobility and enhances productivity through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. Encompassing a broad range of wireless and wire-line communications an ITS enriches existing roadway system operations in a cost effective manner.⁷

ITS Technologies and Applications

ITS can apply to all forms of transportation, it has the capacity to improve safety, reduce vehicle wear, shrink delay, and lessen fuel consumption. Highlighted in **Table 11-3**, ITS technology includes both intelligent transportation technologies and intelligent transportation applications.

Table 11-3 Intelligent Transportation Technologies & Applications	
Intelligent Transportation Technologies	Intelligent Transportation Applications
<ul style="list-style-type: none"> ▶ Wireless communications ▶ Computational technologies ▶ Floating car data/floating cellular data ▶ Sensing technologies ▶ Inductive loop detection ▶ Video vehicle detection ▶ Bluetooth detection 	<ul style="list-style-type: none"> ▶ Electronic toll collection ▶ Emergency vehicle notification systems ▶ Cordon zones with congestion pricing ▶ Automatic road enforcement ▶ Variable speed limits ▶ Collision avoidance systems ▶ Dynamic Traffic Light Sequence ▶ Ramp Metering

Intelligent Transportation Systems in Northern Colorado

In the NFRMPO region a number of ITS strategies are currently in place to help travelers, including:

⁷ About ITS. US Department of Transportation, Office of the Assistant Secretary for Research and Technology Intelligent Transportation Systems Joint Program Office. Accessed 5/7/15. <http://www.its.dot.gov/faqs.htm>

- ▶ Automatic Traffic Recording Devices - Tube Counters, Inductive Loop Detection, Bluetooth, Wi-Fi, Video Vehicle Detection
- ▶ Backup Traffic Signal Control Cabinets
- ▶ Closed Circuit TV
- ▶ Fiber Optic Communications
- ▶ In-Pavement Traffic Sensor - Inductive Loop Detection
- ▶ Lane Control Signage
- ▶ Pavement Condition Detection
- ▶ Dynamic Message Signage
- ▶ Weather Stations – Provide precipitation detection, visibility measurements, wind speed, surface condition, etc.

In 2011, CDOT, the NFRMPO, and local jurisdictions developed the CDOT Region 4 Intelligent Transportation Systems Strategic Implementation Plan.⁸ The plan serves as the guiding document for ITS projects to 2021, and identifies the funding needs, recommended deployment time frames, and potential funding sources. Funded ITS projects are covered in **Chapter 2**.

Transit Congestion Management Strategies

Bus Rapid Transit

BRT is “an integrated system of facilities, equipment, services, and amenities that improves the speed, reliability, and identity of bus transit.”⁹ BRT can be thought of as an above ground subway or a rubber-tired light rail system with the added benefit of having greater operating flexibility and potentially lower costs. This high-frequency service offers not only congestion mitigation benefits, but community development benefits as well. The constant availability of a bus is attractive to travelers, residents, and business owners.

A number of facilities augment the capacity and usefulness of BRT. To eliminate conflicts with slower vehicles BRT can use dedicated right-of-way lanes in the median. Station platforms level with the bus floor accelerate passenger boarding time and allow wheelchairs to easily roll on or off the bus. Off-board fare collection systems allow passengers to pre-pay before using the BRT. To decrease intersection wait times BRT is prioritized in the signal queue. Emergency vehicles also benefit from BRT by having an additional travel lane.

⁸ CDOT Region 4 Intelligent Transportation Systems Strategic Implementation Plan. Colorado Department of Transportation. June 2011. http://www.cotrip.org/content/itsplans/CDOTRegion%204%20ITS%20Strategic%20Implementation%20Plan_06-30-11.pdf

⁹ TRCP Report 118. Bus Rapid Transit Practitioner’s Guide. Transportation Research Board. 2007. Washington, D.C. http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_118.pdf

Operational Transit Congestion Management Measures

A number of factors can be incorporated in transit service strategies which can be implemented to further enhance the effectiveness of transit. The factors include:

- ▶ Pricing Factors
 - Reduction or elimination fares
- ▶ Service Quantity Factors
 - Increasing service hours including Sunday service
 - Reducing the time between transit vehicles
 - Reducing transfer time
 - Prioritizing transit vehicles at traffic signals
 - Focusing routes on high density corridors or locations
- ▶ Service Quality Factors
 - Transit stop amenities
 - Off-board fare collection
 - Bus scheduling information
 - Station and in-route safety
 - Customer service
 - Cleanliness¹⁰

Reducing or eliminating fares can play a large role in increasing transit ridership. Currently, free transit passes for CSU, UNC, and some K-12 students incentivize use of the transit network. During the 2014-2015 school year GET ridership numbers increased 313 percent among elementary, middle, and high school students with identification for the Ride Free with ID program, which totaled approximately 47,000 rides.

Adjacent land use practices compound the usefulness of transit; for college students transit helps connect residential facilities with campus; business along transit routes is encouraged by the accessibility transit offers; and employers are incentivized to locate near transit to offer transportation options for employees.

In Fort Collins, a Transit-Oriented Development (TOD) Overlay Zone was developed to focus growth around the MAX BRT system along the Mason Street corridor. Running north-south through Fort Collins the Mason Street corridor connects residents to a mix of housing, office, and retail opportunities. The MAX BRT system along Mason Street increases economic opportunity, active lifestyle choices, and access to employment options while

¹⁰ Taylor, Brian D. & Fink, Camille N.Y. The Factors Influencing Transit Ridership: A Review and Analysis of the Ridership Literature. UCLA Department of Urban Planning Working Paper. 9/4/2013. Los Angeles, CA.
<http://www.uctc.net/papers/681.pdf>

reducing vehicular congestion. This concentration of accessible development reduces resident’s transportation costs while increasing property values near the BRT system.

Service quantity factors help improve the frequency of transit. These efforts typically focus routes on high density corridors and locations. In 2009, Transfort adopted their Transit Strategic Operating Plan which focuses on creating a productive transit system rather than a system with complete citywide coverage. Similarly, GET is reconfiguring transit routes in 2016 to increase productivity by reducing coverage. A bus service offering frequent service ensures maximum ridership by encouraging potential riders to make a mode shift. Offering weekend and Sunday service further increases the utility of transit. Service quality is an important factor in continued ridership. Riders are willing to continue using transit when safe, clean, and convenient transit travel is offered.

Traffic Incident Management

A traffic incident is any occurrence that impedes the normal flow of traffic on a highway, including crashes, vehicle breakdowns, and spilled loads. According to FHWA:

*Traffic Incident Management (TIM) consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders.*¹¹

The Traffic Incident Management (TIM) program is part of the FHWA’s Emergency Transportation Operations (ETO) and plays a critical role in ensuring consistent traffic flow in the NFRMPO region. TIM activities are typically categorized into five overlapping functional areas:

- ▶ Detection and Verification
 - Detection: the determination that an incident of some type has occurred.
 - Verification: the determination of the precise location and nature of the incident.
- ▶ Traveler Information
 - The communication of incident related information to motorists who are at the scene of the incident, approaching the scene of the incident, or not yet departed from work, home, or other location.
- ▶ Response
 - The activation of a “planned” strategy for the safe and rapid deployment of the most appropriate personnel and resources to the incident scene.
- ▶ Scene Management and Traffic Control

¹¹ Traffic Incident Management. U.S. Department of Transportation. Federal Highway Administration. Emergency Transportation Operations. http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm Accessed 6/2/15.

- Scene Management: the coordination and management of resources and activities at or near the incident scene, including personnel, equipment, and communication links.
- Traffic Control: the process of managing vehicular traffic around the scene of the incident.
- ▶ Quick Clearance and Recovery¹²
 - Clearance: the safe and timely removal of a vehicle, wreckage, debris, or spilled material from the roadway.
 - Recovery: the restoration of the roadway to its full capacity.

These functional areas incorporate a number of operational agencies to assist in traffic incident recovery. Typically, the agencies responsible for incident recovery include: CDOT, state and local law enforcement, Fire/EMS, local jurisdictions, coroners, courtesy patrols, and towing/recovery agencies.

Traffic Incident Management in Northern Colorado

Between 2001 and 2011, the I-25 corridor between SH 7 and the Wyoming border experienced a 2.4 percent annual growth rate in Annual Average Daily Traffic (AADT) and a 27 percent increase in traffic demand. Between 2006 and 2010, there were 545 crashes resulting in injuries or fatalities (an average of 103 per year).¹³

In June 2012, CDOT released the I-25 Traffic Incident Management Plan or TIMP. The plan covers the entire length of I-25 in the NFRMPO region. The purpose of the TIMP is to, “provide a planned, coordinated, and cooperative approach to detecting and removing incidents and restoring traffic capacity as quickly and safely as possible.”¹⁴

The I-25 Traffic Incident Management Plan offers a number of recommendations to improve incident response, including: consistent, compatible communication technology between responding agencies for an informed emergency response; creation of specific detour plans and procedures in advance to accelerate opening travel corridors; increasing the visual coverage of transportation corridors with cameras and other ITS solutions to accelerate knowledge of the scene; installing additional variable message signs (VMS) to help motorists make informed decisions about entering or leaving a corridor; unifying the command system dispatch agencies use to communicate; and establishing a standing project management team to evaluate the performance of incident plans.

¹² Best Practices in Traffic Incident Management. U.S. Department of Transportation. Federal Highway Administration. Emergency Transportation Operations. September 2010. <http://ops.fhwa.dot.gov/publications/fhwahop10050/ch2.htm> Accessed 6/2/15.

¹³ Traffic Incident Management. U.S. Department of Transportation. Federal Highway Administration. Emergency Transportation Operations. http://ops.fhwa.dot.gov/eto_tim_pse/about/tim.htm Accessed 6/2/15.

¹⁴ I-25 Traffic Incident Management Plan, SH 7 to Wyoming State Line. Colorado Department of Transportation. June 2012.

E. Next Steps

Future Congestion Data Collection

Travel Time Datasets

In addition to the NPMRDS and the City of Fort Collins Bluetooth Dataset, the MPO will be assisting the cities of Greeley, Loveland, and CDOT purchase and install Bluetooth counters. These counters will be placed at signalized intersections along regionally significant corridors near each of the communities. In the future, these four datasets will be used to inform the Annual CMP Report. The datasets will increase in value as a collection of longitudinal information is created. Using overlapping locations the three community datasets will be used to validate each other and the NPMRDS dataset.

NFRMPO Travel Demand Model Update

The NFRMPO Travel Demand Model is updated with the RTP approximately every four years. This is done to accurately reflect the transportation infrastructure network and refine the criteria the model uses to forecast future conditions. As the travel time datasets become more robust they will help supply the model with accurate information to ensure validity. In the interim years, the NFRMPO staff will be updating the model to add the speed limit data to all of the links in the model to allow the TTI to be calculated using the speed limit.

Annual CMP Performance Measure Reports

The NFRMPO releases an annual CMP Performance Measure Report each winter/spring. Using data collected throughout the year based on the criteria listed in **Section D**, the region's demographic data, congestion trends and transportation system performance is quantified for analysis. This analysis used to inform regional priorities in the RTP and project selection for the TIP.

The NFRMPO CMP will use the performance measures listed in **Section D**:

- ▶ Travel Time Index
- ▶ Vehicle Miles Traveled
- ▶ Transit Performance Measures

Additionally, the NFRMPO will include information on:

- ▶ Historical Transportation Trends
- ▶ Crashes (Passenger Vehicles, Trucks, Bicycle, Pedestrian)
- ▶ Transit Ridership
- ▶ VanGo™ Ridership
- ▶ Transportation Demand Management Practices
- ▶ Programmed and Implemented Projects

- CMP's Role in Project Selection
- Selected Projects
- Implemented Projects
- ▶ External Influences on the Transportation Network
 - Gas Prices
 - Population and Unemployment Statistics
 - Transportation Funding and Gas Tax