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Background and Introduction

The Community Planning Association of Southwest Idaho (COMPASS) is an association of local governments working together to plan for the future of Ada and Canyon Counties, Idaho. COMPASS is a voluntary, member-based organization governed by a Board of Directors who represent COMPASS member agencies. COMPASS serves as the metropolitan planning organization, or MPO, for Ada and Canyon Counties. As such, COMPASS shapes the future of the region by developing the regional long-range transportation plan, providing technical expertise, facilitating regional cooperation, and directing where and how federal transportation funds will be spent in the two-county area (referred to as the "Treasure Valley").

The COMPASS Planning Area encompasses all of Ada and Canyon Counties. This area includes the Boise Urbanized Area (designated a TMA, or Transportation Management Area, due to a population of greater than 200,000), as well as the Nampa Urbanized Area, small urban clusters, and rural areas (Figure 1). This larger planning area allows COMPASS to consider all regional needs, as well as to anticipate the expansion of urban areas that accompany local growth.

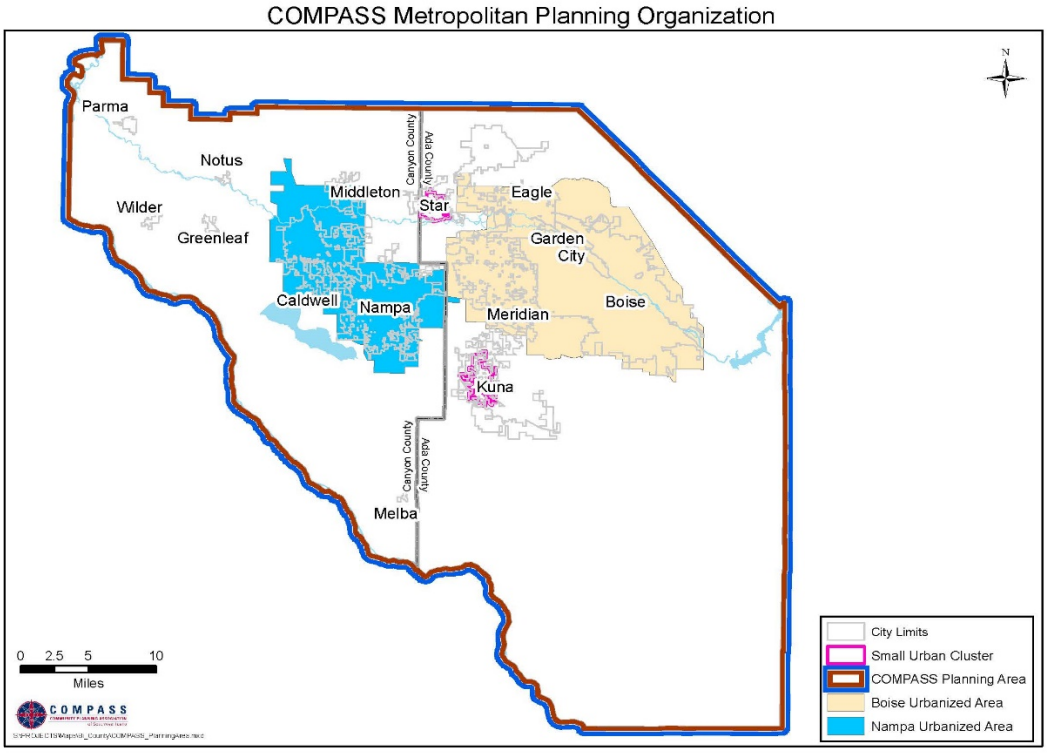

Figure 1: COMPASS Planning Area in Ada and Canyon Counties

This document describes the steps that make up the congestion management process (CMP) used by COMPASS to measure, report, identify, mitigate, and manage congestion in the Treasure Valley. The intent of the CMP is to establish a definitive, transparent, and effective decision-making process to prioritize investments in congestion management strategies that support the long-term vision and goals of the region.

A defined process ensures that results are predictable and measurable. However, it is also a "living" process, as it will be reviewed and updated with each iteration of the regional transportation plan or as otherwise deemed necessary.

COMPASS supports the implementation of the CMP by providing its member agencies with detailed congestion analyses, identifying regional congestion management needs, and developing and implementing congestion management strategies.

A detailed analysis of congestion in the region, highest priority congested roadways/intersections/corridors, congestion management needs and strategies, and an implementation plan are completed on an annual basis in a separate report called the Congestion Management Annual Report[1]. The framework of the CMP (outlined in this document), including goals, objectives, performance measures, and the defined roadway network, will be updated as needed in coordination with the long-range transportation plan.

Congestion Management Process

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. A CMP is a systematic, cyclical, and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance, identifies congestion mitigation needs, and offers alternative strategies to mitigate the effects of congestion.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) was the first piece of federal legislation to introduce a requirement to monitor congestion and identify strategies to alleviate it. The 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) expanded upon ISTEA by further defining the CMP as an ongoing process meant to be fully integrated into the overall transportation planning process at the state and regional level. The Moving Ahead for Progress in the 21st Century Act (MAP-21) and the Fixing America's Surface Transportation Act (FAST Act) reaffirmed that a CMP is still needed, added performance measure reporting requirements, and expanded the list

[1] www.compassidaho.org/prodserv/cms-intro.htm

of suggested congestion management strategies. The Federal Highway Administration (FHWA) requires all MPOs that serve urbanized areas with populations over 200,000, designated as a TMA have a CMP.

According to the Code of Federal Regulations (CFR), 23 CFR 450.322 (a) and (b)[2], *"TMAs shall cooperatively address congestion management through a process that provides for a safe and effective integrated management and operation of the multimodal transportation system…through the use of travel demand reduction and operational management strategies."*

Federal guidelines provide MPOs with discretion in how the CMP process is conducted, allowing the approach used by COMPASS to reflect community goals and policies to influence the types of solutions and investment priorities for managing congestion.

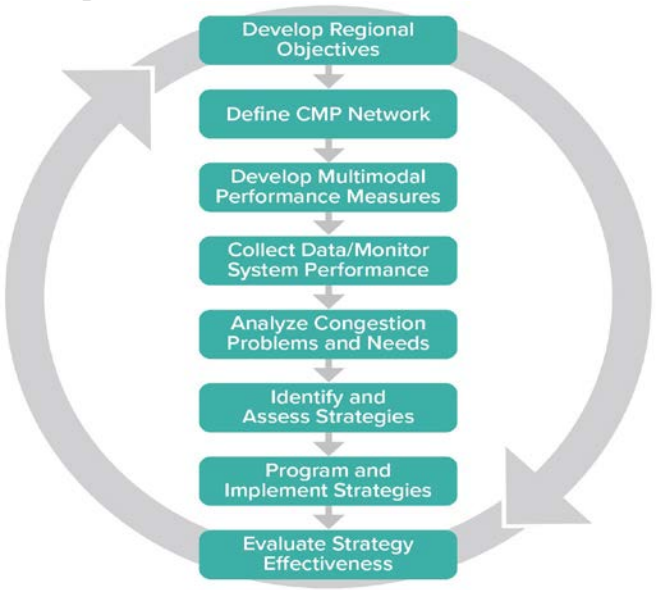

Figure 2: Elements of the Congestion Management Process

This update to the original *Treasure Valley Congestion Management System Plan*[3] (2005) was developed to better align with FHWA's publication, *Congestion Management Process: A Guidebook*[4] (2011) and changes/updates in the CFR pertaining to the congestion management process. The CMP includes steps to execute a performance-driven and performance-based approach to manage congestion.

This document is organized using the eight actions and iterative nature of the CMP as described in FHWA's congestion management guidebook[5] (Figure 2). As part of this update, COMPASS staff reviewed CMP examples developed for other areas[6].

The CMP and Regional Transportation Planning Process

The CMP is designed to support the regional transportation planning process. Key regional planning products that are developed by COMPASS, such as the regional long-range transportation plan, the regional transportation improvement program

[2] www.ecfr.gov/current/title-23/chapter-I/subchapter-E/part-450/subpart-C/section-450.322
[3] www.compassidaho.org/documents/prodserv/reports/TreasureValleyCMSFinal.pdf
[4] www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf
[5] www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf
[6] COMPASS reviewed CMP examples from Spokane Regional Transportation Council, Southwest Washington Regional Transportation Council, the Denver Regional Council of Governments in Colorado, Transportation Planning Organization-Chattanooga, and the Wasatch Front Regional Council in Salt Lake City, Utah.

(TIP), and other studies and plans, are informed by and contribute to the CMP action steps (Figure 3).

Long-range plan congestion-related goals and objectives were used in the initial step of the CMP, "develop purpose and goals." These goals and objectives were envisioned by regional leaders with public input during the development of the regional transportation plan to set the direction and vision of how the transportation system should serve the region. Using the goals from the long-range transportation plan ensures that the strategies and policies of the CMP align with overall regional goals.

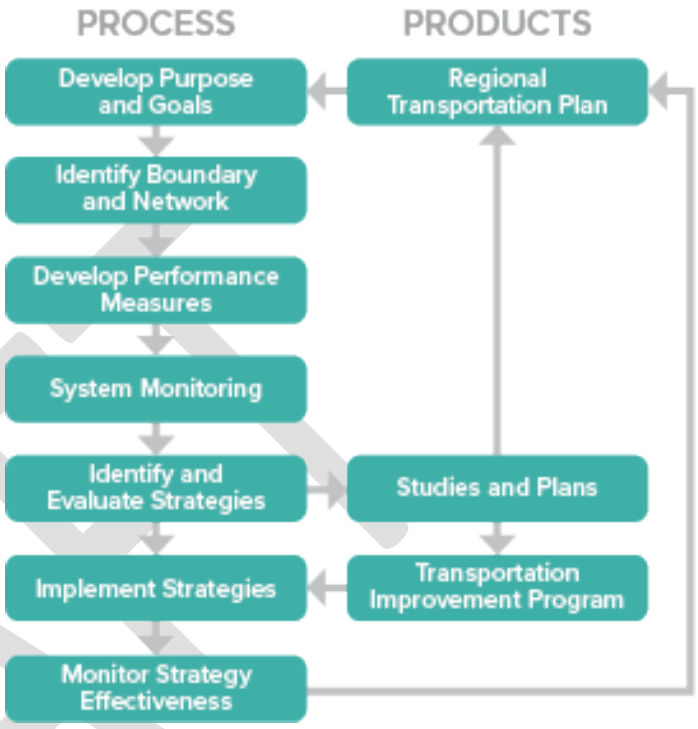

Figure 3: Congestion Management and Regional Transportation Planning Linkages

The CMP defines how data are collected and analyzed in order to measure progress toward these goals and objectives. In the ensuing steps of the CMP, congestion performance at local and regional levels is analyzed to determine where congestion exists and to identify regional system level congestion issues. The CMP identifies multiple strategies to address these issues, though sometimes a better understanding of the problem is necessary to select the appropriate strategy. This can lead to the need for studies or plans at the corridor or sub-area level or to the need for a transportation system management and operations plan.

Congestion mitigation strategies are implemented through projects that make their way into the local, state, and regional transportation programs. The impacts that these strategies have on congestion at a local and regional scale are measured and reported in the final step of the CMP. This feedback portion of the process helps inform planners and operators which congestion mitigation strategies are most effective and should continue to be used. This information also informs the update of the regional long-range transportation plan.

The COMPASS Congestion Management Process

This section details the steps of COMPASS' Congestion Management process. The steps align with FHWA's guidance on the Congestion Management Process and are developed to support existing regional goals, objectives, data, and parallel processes.

1. Develop Regional Objectives for Congestion Management

The first step of the CMP is to develop regional planning objectives for congestion management. As the CMP is an integral part of the regional long-range transportation planning process, the goals, objectives, and targets from the regional transportation plan were used to develop the objectives and targets for the CMP. This ensures that there is consistency in transportation planning policies and goals. The objectives from the regional plan were reviewed and those relevant to congestion and congestion management were selected for incorporation in the CMP. The goals, objectives, and targets were developed by the COMPASS Regional Transportation Advisory Committee and approved by the COMPASS Board of Directors during the development of the regional transportation plan.

The objectives define the desired outcomes of the CMP in ways that can be measured and monitored for progress. Performance measures and targets are defined in this plan, as well as in the regional transportation plan, for tracking progress toward these objectives (*Table 1*). Progress on these objectives is reported in the biennially published *Change in Motion Scorecard*[7]. Many types of data are available to measure on-going progress, including travel time data, crash data, public transportation ridership data, walking and bicycling count data, and Geographic Information System (GIS) layers that describe various components of the existing and planned transportation system.

[7] www.compassidaho.org/prodserv/gtsm-perfmonitoring.htm

Table 1: Congestion Management Process Objectives and Targets (from long-range transportation plan, Communities in Motion 2050)

Objectives	Description	Targets
Freight Accessibility and Mobility	Promote **freight accessibility and mobility** via truck and rail improvements to support the efficient movement of goods and encourage economic development.	Achieve and maintain a Truck Travel Time Reliability measure of less than 1.3 for the interstate system.
Reliability	Provide for a **reliable** transportation system to ensure all users can count on consistent travel times for all modes.	Achieve and maintain greater than 90% of interstate and 70% national highway system person miles traveled reliable. Achieve and maintain greater than 90% rate of transit trips on-time.
Safety	Provide a safe transportation system for all users.	Reduce the rolling 5-year averages (number and rates from 2020) of auto and non-motorized fatalities and serious injuries by 75% by the year 2030.
Accessibility and Mobility	Develop a regional transportation system that provides **access and mobility** for all users via safe, efficient, and convenient transportation options.	Increase the percentage of households within a half mile distance of transit stops. Increase number of vanpools by 20% by the year 2030.
Connectivity	Develop a transportation system with high **connectivity** that preserves capacity of the regional system and encourages walk and bike trips.	Increase the percentage of households within a half mile network distance of public schools (to >73%), regional activity centers (**TBD**), and transit stop (to >85%) by 2030.
Efficiency and Congestion Reduction	Manage and reduce **congestion** with cost-effective solutions to improve **efficiency** of the transportation system.	Achieve less than 15 days of serious disruption (>30% longer than average travel time) to weekday commutes on the interstate by 2030. Keep the percentage of congested roadway miles on the CMP roadway network to < 8% by 2030. Reduce peak hour excessive delay per capita
Environment	Develop and implement a regional vision and transportation system that protect and preserve the natural **environment**.	Reach 25% or greater of weekday work commutes classified non-single occupancy vehicle by 2030.

Additional Objectives for Federal Reporting Purposes

Federal regulations require COMPASS to monitor key congestion performance measures outlined in MAP-21 and the FAST Act to better understand congestion and safety issues.

The goals listed in MAP-21 and the FAST Act are analogous to the goals and objectives in COMPASS' regional transportation plan and CMP but are set at a national scale. The goal areas from MAP-21 and the FAST Act that relate to the CMP address safety, congestion reduction, system reliability, and freight movement and economic viability (Table 2). COMPASS develops regional and supports statewide targets and monitors progress toward achieving these goals. These reporting elements are included in the *Change in Motion Scorecard* and apply to all MPOs with TMAs, such as COMPASS, as well as state transportation agencies.

Table 2: National Performance Goals

Goal Area	National Goal
Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
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.

2. Define the CMP Network

This step defines the portions of the transportation system that are monitored and analyzed for congestion and system performance as part of the CMP. The COMPASS Planning area covers both Ada and Canyon Counties, which includes the Boise Urbanized Area (Idaho's only TMA) in Ada County and the Nampa Urbanized area in Canyon County. COMPASS will monitor and analyze the vital roadways, the public transit system, the designated freight network, and non-motorized transportation facilities such as regional off-street trails, bike lanes, and multi-use pathways, as described below. Together, these elements make up the multimodal system that support the objectives of the CMP, the regional transportation plan, and the national performance goals.

Roadway System

Roadways are the backbone of the transportation system in Ada and Canyon Counties. Buses, commuter vans, freight vehicles, and individuals in private cars rely on our roadways. In addition, bike lanes and sidewalks along roadways provide a significant portion of our local bicycle and pedestrian infrastructure. For the roadway component of the CMP, COMPASS has designated two tiers to track congestion management performance, based on availability of data and federal reporting requirements (Figure 4).

Tier 1 -- The first tier of the roadway component is made up of the facilities included in the National Performance Management Research Data Set (NPMRDS). This data set is provided to MPOs without cost and used to report on the federal performance measures.

In general, the Tier 1 facilities include the interstate, most state highways, and other roadways designated as National Highway System (NHS) routes. Tier 1 covers over 220 bidirectional centerline miles and includes the following corridors:

- Interstate 84
- Interstate 184
- US Highway 20/26
- State Highway 55
- State Highway 19
- US Highway 95
- State Highway 44
- State Highway 45
- State Highway 69

Tier 2 -- The second tier of the roadway component includes additional state highways, arterials, and collector roads that are outside the scope of the NPMRDS

and NHS. Data regarding this set of roadways are purchased from third party vendors.

This data set covers an additional ~500 bidirectional centerline miles of roadway.

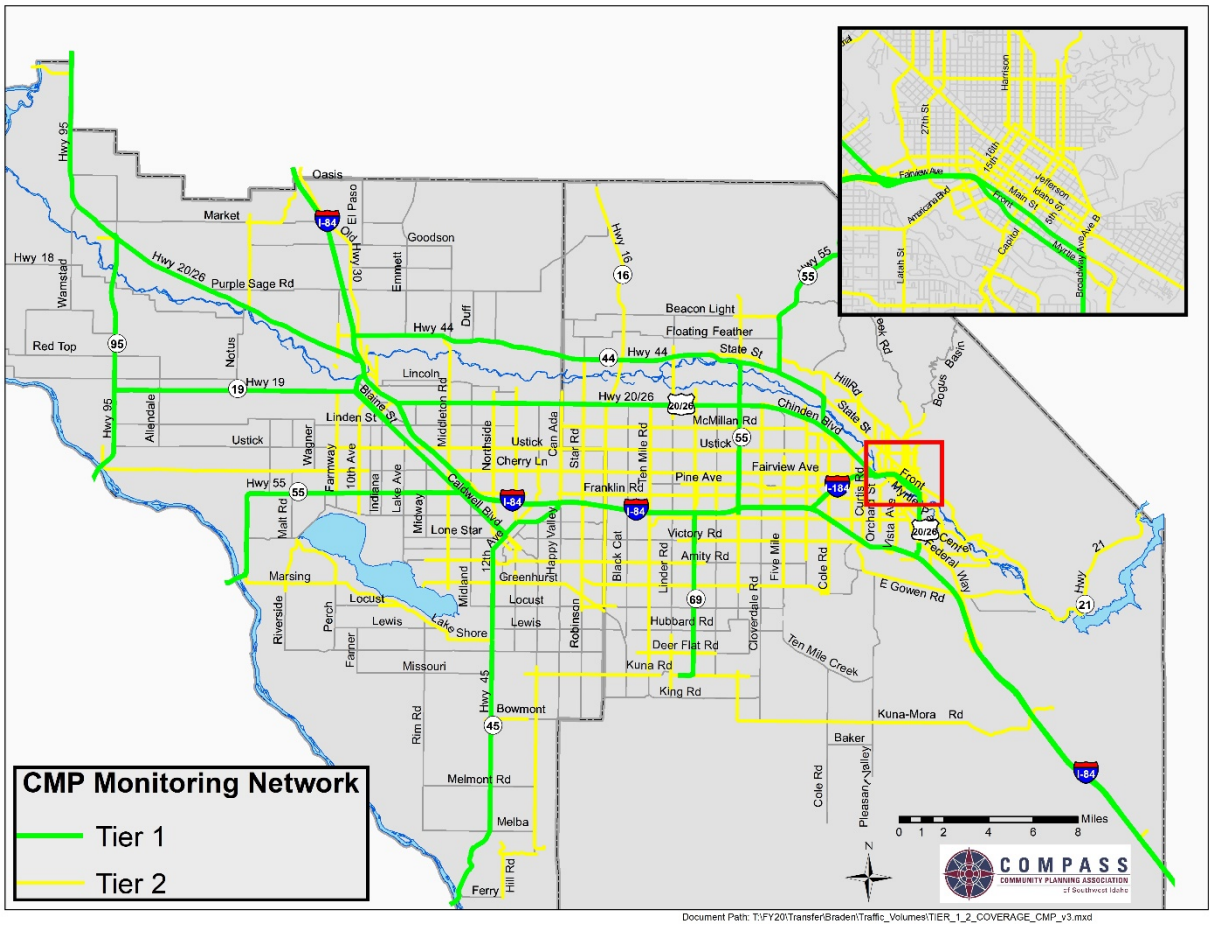

Figure 4: COMPASS CMP Roadway Monitoring Network

Multimodal Transportation Network

In addition to monitoring the roadway system, the CMP will also monitor how and where congestion is impacting the transit, active transportation, and freight systems and networks. The public transit and active transportation systems offer practical transportation and commute alternatives that may help to alleviate roadway congestion, benefit the environment, and support community health. The freight network is critical for ensuring that goods and commodities move efficiently in the region. The CMP includes congestion management strategies directly targeted at improving the efficiency, reliability, and extent of these networks.

Public Transit System

Valley Regional Transit[8] (VRT), the region's public transit authority, operates 22 fixed bus routes and one on-demand bus route that cover and connect both Ada and Canyon Counties (Figure 5). VRT also coordinates and subsidizes several mobility services for elderly, vulnerable, and low-income individuals. The public transportation network operates on several of the interstate, state highway, and arterial roadways identified in the Tier 1 and Tier 2 roadway network.

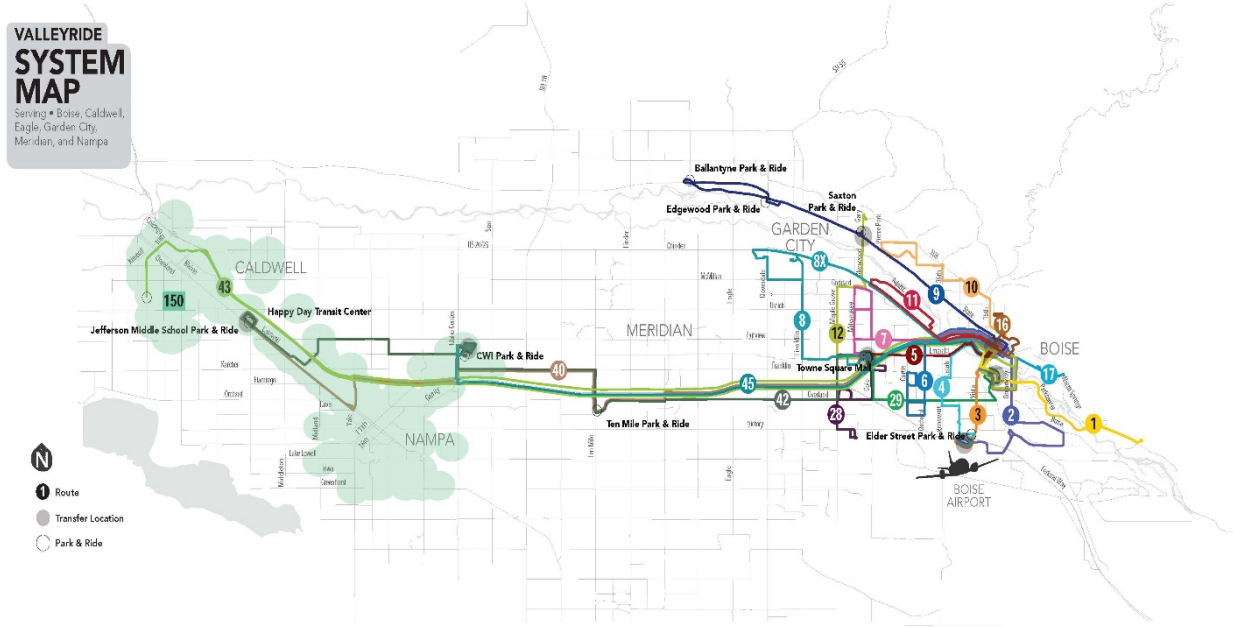

Figure 5: Valley Regional Transit Route Map

The Ada County Highway District (ACHD) operates a vanpool system, Commuteride[9], to provide commuters with an additional transportation option. Vanpools are an effective transportation demand management strategy to maximize the efficiency of the existing transportation system as well as benefit the environment by partnering with employees and employers to "share the ride" on their daily commute. This system is more dynamic than the fixed bus routes and can help support commuters that may not have easy access to the existing public transit system.

COMPASS works closely with VRT, ACHD Commuteride, and other partners to plan for the future public transportation system[10].

[8] www.valleyregionaltransit.org/
[9] www.commuteride.com/
[10] www.compassidaho.org/prodserv/publictrans/publictrans.htm

Active Transportation System

Bicycle and pedestrian facilities are managed by the transportation and land use agencies in Ada and Canyon Counties. The active transportation system is comprised of sidewalks, pedestrian crossings, bike lanes, pathways, trails, and greenbelts. This system is planned and developed through close coordination between the transportation and land use agencies, as well as input from community advocacy groups. The active transportation system[11] provides citizens with safe, comfortable, and convenient non-motorized modes of transportation to allow them to access the places that are most important to them.

Freight Network

The movement of freight is integral to the regional economy and is changing rapidly with ever-increasing home deliveries, new technologies that affect manufacturing processes, and more. COMPASS works with the Freight Advisory Workgroup to identify critical freight corridors (interstate, state highway, and arterials), deficiencies, and needs that are key to selecting and prioritizing transportation projects and informing land use development decisions adjacent to freight corridors and industrial areas. The freight network[12] enables efficient urban deliveries, supports rural economies, and strengthens global connections.

Complete Network Policy

The COMPASS Complete Network Policy[13] provides an approach to ensuring that the entire transportation system serves all users — pedestrians, bicyclists, transit users, and people of all ages and abilities, as well as freight and motor vehicle drivers. The policy is a shift in thinking from COMPASS' previous complete streets policy, which maintained the notion that all streets should serve all modes. The complete network policy focuses on the modal networks and how they interact within the larger transportation system and their surrounding land use. By looking at the bigger picture, networks are better connected, and modal conflicts are better accommodated. The complete network policy defines a vision that supports mobility, connectivity, safety, and efficiency of all modes.

[11] www.compassidaho.org/prodserv/activetrans/activetransportation.html
[12] www.compassidaho.org/prodserv/CIM2040_2.0/freight.html
[13] www.compassidaho.org/documents/people/policies/CompleteNetworkPolicy_Final_Dec2021_2022-01.pdf

3. Develop Multimodal Performance Measures

Multiple performance measures are used to track progress toward achieving the objectives of the CMP. The measures, and their associated targets, were defined and recommended by COMPASS' Regional Transportation Advisory Committee and approved by the COMPASS Board of Directors during the development of the regional transportation plan. The measures used to identify congestion on the monitoring network are a mix of measures carried forward from the previous CMP, FHWA's congestion management guidebook[14], MAP-21/FAST Act federal performance measures, and measures based on best practices from other MPOs.

Performance can be scaled on the COMPASS CMP network at three levels: regional, corridor, and road segment levels. Analyzing congestion at these levels recognizes the fact that different congestion mitigation strategies are applicable at different scales. For example, overarching strategies and policies, such as access management policies and transportation demand management strategies, are best suited for tackling region-wide congestion. However, at the corridor level, improved signal timing or an increase in transit service may be most beneficial. At the road segment level, specific bottlenecks can be identified, and capacity projects or intersection improvements can be implemented to address them. It is critical to analyze the CMP network at all these levels in order to implement a mixture of strategies to maximize the benefits of congestion management.

These measures are subject to change as new data become available, best practices are updated, or the goals for congestion management in the region change.

Regional CMP Performance Measures and Targets

The regional CMP performance measures (Table 3) and targets are linked to the objectives identified in the regional transportation plan and objectives of the CMP. These regional measures are representative of the multimodal transportation system. The trends revealed by comparing these measures over time can provide a useful context for understanding the overall state of congestion in the region and how well congestion mitigation strategies are performing. These measures are reported on a biennial basis in the COMPASS *Change in Motion Scorecard* and the *Congestion Management Annual Report*. Explanation of data and methodology used to calculate the regional performance measures can be found in Appendix B of this document.

[14] www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

Table 3: CMP Performance Measures

Performance Measure	Description	Report Location
Objective: Freight accessibility and mobility		
Truck travel time reliability (Interstate)[#]	Weighted (length) average truck travel time reliability measure for the interstate system. Reliability for a roadway is calculated by comparing the 95th percentile travel time to the 50th percentile travel times for peak periods for the year.	Change in Motion Scorecard Congestion Management Annual Report
Objective: Reliability		
Interstate travel time reliability[#]	Percentage of person miles traveled (average annual daily traffic X occupancy X segment length) on the interstate considered reliable for the year. Reliability for a roadway is calculated by comparing the 80th percentile travel time to the 50th percentile travel time for peak periods for the year.	Change in Motion Scorecard Congestion Management Annual Report
NHS travel time reliability[#]	Percentage of person miles traveled (average annual daily traffic X occupancy X segment length) on the NHS (excluding interstate) considered reliable for the year. Reliability for a roadway is calculated by comparing the 80th percentile travel time to the 50th percentile travel time for peak periods for the year.	Change in Motion Scorecard Congestion Management Annual Report
Transit reliability (% of trips delivered on time)	Percentage of stops on fixed route transit with arrivals no later than 5 minutes past scheduled and departures no earlier than scheduled for the reporting period.	Change in Motion Scorecard Congestion Management Annual Report
Objective: Safety		
Number auto of fatalities[#]	Five-year rolling average of auto fatalities. This number excludes bicycle and pedestrian fatalities related to autos.	Change in Motion Scorecard
Number of people injured in auto crashes[#]	Five-year rolling average of auto serious injuries. This number excludes bicycle and pedestrian serious injuries related to autos.	Change in Motion Scorecard
Rate of auto fatalities[#]	Five-year rolling average of the rate of auto fatalities. The rate is calculated by auto fatalities per 100,000,000 vehicle miles traveled in Ada and Canyon Counties.	Change in Motion Scorecard
Rate of auto serious injuries[#]	Five-year rolling average of the rate of auto serious injuries. The rate is calculated by auto serious injuries per 100,000,000 vehicle miles traveled for the year in Ada and Canyon Counties.	Change in Motion Scorecard

Performance Measure	Description	Report Location
Non-motorized fatalities and serious injuries[#]	Five-year rolling average of bicycle and pedestrian fatalities and serious injuries.	Change in Motion Scorecard Federal Performance Measure
Total injury crashes	Five-year rolling average number of auto crashes involving injury for the reporting period.	Change in Motion Scorecard
Objective: Accessibility and mobility		
Job accessibility (Auto)	Average number of jobs accessible by automobile within 15 minutes on average weekday from all Traffic Analysis Zones (TAZs) in the travel demand model.	Change in Motion Scorecard
Job accessibility (Transit)	Average number of jobs accessible by transit within 30 minutes on average weekday from all TAZs in the travel demand model.	Change in Motion Scorecard
Vanpools	Average number of vanpools operating for the year.	Change in Motion Scorecard
Households near transit	Percent of total households in Ada and Canyon counties within ½-mile network distance of an existing ValleyRide stop.	Change in Motion Scorecard
Transit passenger ridership	Number of passengers for the year on fixed route transit. Data come from Valley Regional Transit's automatic passenger counters.	Change in Motion Scorecard
Objective: Connectivity		
Walkability: Public Schools	Percentage of households within ½-mile distance of a school that can access the school using the walkable network (½-mile walk)	Change in Motion Scorecard
Walkability: Transit stops	Percentage of households within ½-mile distance of a transit stop that can access the stop using the walkable network (½-mile walk)	Change in Motion Scorecard
Walkability: Regional Activity Centers	Percentage of total households in or within ½ mile network distance of a regional activity center.	Change in Motion Scorecard
Objective: Efficiency and congestion management		
Percentage of roadway miles considered highly congested	Percent of roadway miles with travel time index (TTI = Peak Hour Congested Travel Time/Free Flow Travel Time) > 2 for tier 1 congestion management network. Data come from the National Performance Measure Research Data set and includes interstate, state highway, and other facilities designated as National Highway System.	Change in Motion Scorecard Congestion Management Annual Report

Performance Measure	Description	Report Location
Number of "event" days on the interstate	Number of weekdays in a year with congestion on I-84/I-184 causing a 30% longer than average commute from Caldwell to Boise (AM peak) or Boise to Caldwell (PM peak). Current commute times average about 30 minutes for both the AM and PM peak hours.	Change in Motion Scorecard Congestion Management Annual Report
Annual hours of peak hour excessive delay per capita[#]	Total hours of excessive delay (20mph slower than, or 60% of, the posted speed limit) during peak travel time (weekdays 6am-10am and 3pm-7pm) calculated per capita for the Boise Urbanized Area.	Change in Motion Scorecard Congestion Management Annual Report
Objective: Environment		
Non-Single Occupancy Vehicle Mode Share[#]	Percentage of commutes completed using modes other than single occupancy vehicle for five-year period based on American Community Survey estimates for Boise Urbanized Area as required per the FAST Act.	Change in Motion Scorecard Congestion Management Annual Report
Other key performance indicators		
Bicycle/pedestrian volumes	Average of annual volumes from selected fixed bike pedestrian counters.	Change in Motion Scorecard
Percentage of roadway (arterial/collectors) with bicycle lanes/multiuse pathways	The percentage of arterial and collector roadway that have existing bikeways as defined as a division of a road marked off with painted lines, for use by cyclists, not including sharrows or other markings within automobile lanes or multiuse pathways that allow for bicycle travel.	Change in Motion Scorecard

[#] Federal Performance Measure

4. Collect Data and Monitor Performance

An important part of the CMP is developing a data collection plan to support the CMP performance measures and congestion analysis. It is critical to develop measures around data sets that are reliable and available annually to identify performance trends. This step identifies data sets required to calculate the CMP system performance, help analyze congestion problems, identify congestion management needs, and support the development of congestion management strategies. Table 4 describes the data requirements for the CMP regional (system-level) performance measures listed in Table 3, including the data collected, source, frequency of collection, and scope of the data set. The data come from multiple sources including COMPASS member agencies, existing COMPASS data sets, private vendors, and the federal government. These data sets are subject to change as new data sets become available or the goals and objectives of the CMP change. COMPASS has established many formal and informal agreements to share and acquire these data.

Data collection and system monitoring are needed to provide information to make effective decisions and are typically ongoing activities.

According to federal regulations, the CMP must include "Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources (including archived operational/ITS data) and coordinated with operations managers in the metropolitan area." 23 CFR 450.322(d)(3)

Table 4: CMP System Level Performance Measure Data Requirements

Data Description	Source	Frequency	Scope of Data
Average annual daily traffic (AADT)	Idaho Transportation Department (ITD) Highway Performance Monitoring System	1-2 years	Regional and Tiers 1 and 2
Percent of reliable non-interstate person miles traveled reliable (LOTTR)	ITD	Annual	Tier 1
Percent of reliable interstate person miles traveled reliable (LOTTR)	ITD	Annual	Tier 1
Truck Travel Time Reliability (TTTR)	ITD	Annual	Tier 1
Annual hours of peak hour excessive delay per capita	ITD	Annual	Tier 1

Data Description	Source	Frequency	Scope of Data
Regional bike lane, pathway, sidewalk inventory, walkability network	COMPASS	Annual	Regional and Tiers 1 and 2
Tier 1 travel time	NPMRDS	Annual	Tier 1
Tier 2 travel time	Private Vendor	Funding Dependent	Tier 2
Traffic crashes (number and location)	ITD	Annual	Regional and Tiers 1 and 2
Annual transit passenger miles traveled	VRT	Annual	Regional
Annual transit ridership	VRT	Annual	Regional
Public transit stop and routes	VRT	Annual	Regional
Number of vanpools and ridership	VRT	Annual	Regional
Annual VMT	COMPASS	Annual	Regional
Percent non-single-occupancy vehicle (SOV) travel for work trips	American Community Survey	5 years	Regional
Demographics (households, jobs, population)	COMPASS	Annual	Regional
Transit reliability	VRT	Annual	Regional
Job Accessibility (auto and transit)	COMPASS	Annual	Regional
Bicycle and pedestrian counts	COMPASS	Monthly	Regional
Public School Locations	COMPASS	Annual	Regional

Table 5 describes additional data sets used to analyze congestion at the corridor and road segment level. These data are used to identify locations of congestion and potential causes of congestion, as well as potential future areas of concern.

Table 5: Supplemental Transportation Data to Support Congestion Analysis

Data Description	Source	Frequency	Scope of Data
Traffic volumes	Local jurisdictions	Varies	Regional
Building permits	Local jurisdictions	Annual	Regional
Tier 1 travel time	NPMRDS	Annual	Tier 1
Tier 2 travel time	Private vendor	Funding Dependent	Tier 2
Major road construction projects	Local jurisdictions	Annual	Tiers 1 and 2
Transportation System Management and Operations / Intelligent Transportation Systems (TSMO/ITS) project list	Treasure Valley TSMO/ITS plan	5 Years	Regional
Pavement and bridge condition	ITD bridge and pavement	2 years	Regional

Data Description	Source	Frequency	Scope of Data
	programs		
Location of regional activity centers	COMPASS	Biennially	Regional
Location of regional freight corridors	COMPASS	Periodically	Regional
Demographics data	COMPASS	Annual	Regional
Traffic crashes	ITD	Annual	Regional

Performance Monitoring

COMPASS staff will analyze the CMP data sets (Table 4 and Table 5), calculate the regional CMP performance measures, and report the results in the *Change in Motion Scorecard*[15], a biennially report that tracks progress toward the goals in the regional plan. The data sets in Table 4 and Table 5 will also be used to analyze corridors, roadway segments, and intersections on the CMP network for congestion and to help diagnose the causes of congestion.

Growth Trends

COMPASS tracks development[16] throughout Ada and Canyon Counties on an annual basis to provide a context for understanding how the intensity of development and its proximity to major corridors might impact the transportation network over time. Identifying locations with high concentrations of development activity helps to identify which corridors in the area might experience the most change in traffic volumes and congestion due to new construction. This information also helps to identify appropriate locations for congestion mitigation strategies, such as providing public transportation services on corridors with concentrations of multi-family unit development or operational improvements on corridors with concentrations of single-family home development.

In addition to tracking development, COMPASS also estimates the populations[17] of jurisdictions within its planning area annually and forecasts[18] and allocates future growth.

5. Identify and Analyze Congestion Problems and Needs

Measures used to identify congestion on the CMP monitoring network are calculated using the data from Tables 4 and 5. These metrics and measures support COMPASS and its member agencies by identifying and characterizing areas where congestion mitigation strategies and projects could be applied in order to improve overall performance of the transportation system.

[15] www.compassidaho.org/prodserv/gtsm-perfmonitoring.htm
[16] http://www.compassidaho.org/prodserv/growth_transportation.htm
[17] www.compassidaho.org/prodserv/demo-current.htm
[18] www.compassidaho.org/prodserv/demo-forecasts.htm

Congestion in Ada and Canyon Counties

The transportation infrastructure in the Treasure Valley has seen a surge in usage and demand in the last decade; as a result, congestion is becoming a greater challenge for the region's transportation users, operators, and planners. Although congestion has many negative impacts on fuel consumption, productivity, and the environment, it can also be an indicator of a vibrant economy, as it is a sign that people are driving to work, shopping, and recreating. For the general public in Ada and Canyon Counties, personal history and daily experiences in traveling throughout the region inform what they consider to be acceptable travel conditions.

Congestion is characterized as recurring and non-recurring. Recurring congestion is caused by predictable day-to-day traffic patterns and is usually the result of insufficient capacity and high demand on the transportation system. Traffic in the Ada and Canyon Counties typically peaks during traditional morning (6:00 – 9:00 am) and afternoon/evening (3:00 – 7:00 pm) hours. Some corridors are beginning to experience heavy congestion during the noontime hours, in addition to the traditional peak periods, due to the nature of the adjacent land uses such as universities, retail/commercial centers, major employment centers, and hospitals. Transportation users generally plan their trips around recurring congestion to account for the expected delays.

Non-recurring congestion is temporary and often unpredictable. Non-recurring congestion is often caused by road construction, traffic crashes, inclement weather, special events, and/or emergencies. This unpredictability forces commuters to budget extra time for their commutes.

Congestion is impossible to eliminate, but active management of congestion can help improve reliability, predictability, and dependability, which decreases the amount of extra time that travelers must allot to reach their destinations.

Transportation agencies have several strategies available to them to help mitigate congestion. These strategies vary in cost, scale, and implementation timelines. While additional system capacity is one viable strategy, it is often constrained by financial, physical, social, and environmental factors. Due to these constraints, it is important to evaluate other less constrained strategies to mitigate congestion first.

Dimensions and Measures of Congestion

Congestion is subject to space and time and can be measured and described using four dimensions: intensity, duration, extent, and variability. These four dimensions help characterize congestion issues in terms that are useful for describing how, where, when, and how bad congestion is impacting the transportation system.

These dimensions, defined below, are also useful for determining the causes of congestion[19].

- **Intensity** – The relative severity of congestion that affects travel, such as how much delay there is or how low the travel speeds are. Intensity has traditionally been measured through indicators such as volume to capacity ratios, level of service, or travel time index measures that evaluate the different levels of congestion experienced on roadways.

- **Duration** – The amount of time the congested conditions persist before returning to an uncongested state.

- **Extent** – The number of system users or components (e.g., vehicles, passengers, or lane miles) affected by congestion; for example, the proportion of system network components (roads, bus lines, etc.) that exceed a defined performance measure target.

- **Variability** – The changes in congestion that occur on different days or at different times of day. When congestion is highly variable due to non-recurring conditions, such as a roadway with a high number of traffic crashes causing delays, this has an impact on the *reliability* of the system.

Identifying Congestion on the CMP network

The congestion analysis of the CMP network starts at the road segment level using the NPMRDS for the Tier 1 facilities and a comparable travel time data set for the Tier 2 facilities when available. Five measures are used in evaluating each of the road segments to capture the four dimensions of congestion: Travel Time Index (TTI) to characterize intensity, hours of congestion to identify duration, the length of the road segment to capture the extent, and Level of Travel Time Reliability (LOTTR, TTTR) to determine variability (Table 6). Thresholds are defined for each of these measures to characterize the intensity of congestion for each of the four dimensions (Table 7). These thresholds come from prior renditions of the COMPASS CMP as well as thresholds set for reliability by FHWA for federal reporting purposes. These thresholds were reviewed by the COMPASS' Regional Operations Workgroup (ROWG) for inclusion in the CMP[20].

[19] *Congestion Management Process: A Guidebook*, FHWA, 2011; www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

[20] The ROWG is a regional multi-agency workgroup focused on multimodal transportation efficiency, reliability, and safety.

Table 6: COMPASS CMP Congestion Measures (Corridor/Segment Analysis)

Metric	Description	Dimension of Congestion
Travel Time Index (TTI)	Ratio of free flow travel time to actual measured travel time	Intensity
Hours of Congestion, Weekday Average	Number of hours of the average weekday that a facility is considered highly congested (TTI greater than 2)	Duration
Length (miles)	Miles of congestion	Extent
Level of Travel Time Reliability (LOTTR)	Extent of variation in travel times during peak hours	Variability
Truck Travel Time Reliability (TTTR)	Extent of variation in truck travel times during peak hours on the interstate	Variability

Table 7: Congestion Measure Criteria Thresholds

Congestion Measures	Thresholds
Travel Time Index (TTI)	High Congestion = TTI greater than 2.0 Medium Congestion = TTI between 1.5 and 2.0 Low Congestion = less than 1.5
Level of Travel Time Reliability (LOTTR)	Unreliable = LOTTR 1.5 or more Reliable = LOTTR less than 1.5
Hours of Congestion, Weekday Average (TTI > 2.0)	Long Duration = Hours of congestion 10 hours or more Medium Duration = Hours of congestion between 10 and 6 hours Short Duration = Hours of congestion less than 6 hours
Length (miles)	Segment length is used to weight measures; longer segments will have more weight in ranking
Truck Travel Time Reliability (TTTR)	Unreliable = TTTR 1.3 or more Reliable = TTTR less than 1.3

Once these measures are calculated for each road segment using the travel time data set, they can be rolled up to perform corridor and system-level analyses. The outcomes of these analyses are:

- A ranking of the most congested road segments.
- A set of areas or corridors defined as “congested” based on the performance measures; these congested corridors may be used to denote areas where activities to address congestion are necessary and appropriate.

- A ranking of corridors or road segments throughout the region (sometimes ranked separately in categories based on the function/scale of the facility) to determine which corridors rank the highest in terms of congestion relief needs.
- Identification of bottlenecks on the system.
- Identification of reliability issues on the system.

Initial Investigation of Underlying Causes of Congestion on Critical Corridors

In order to understand which congestion mitigation strategies are appropriate within the context of the system, corridor, or road segment level, it is also necessary to understand the causes of congestion. In addition to the factors described below, the travel time data sets and the data listed in Tables 4 and 5 can help identify the causes of congestion.

Many factors can influence congestion and are considered when analyzing data to characterize congestion:

- **Locations of major activity centers** – in order to understand congestion issues related to specific locations, it is beneficial to have a knowledge of major trip generators (e.g., freight/intermodal facilities, major tourist attractions, stadiums/arenas, universities, hospitals, major employers, airports, and major shopping centers) and the typical traffic patterns, users, and times of high demand at these locations. COMPASS has compiled a data set of major activity centers that identifies these locations.
- **Seasonal variations** – traffic patterns vary throughout the year due to school-related trips, tourist/resort activity, farming and farm equipment activity, weather conditions, and daylight conditions. These seasonal patterns are identified and characterized using traffic volume data or travel time data.
- **Time-of-day variations** – not all locations experience their highest demand during typical peak periods, especially in areas with heavy school traffic (which often coincides with the morning peak but has an earlier afternoon peak) or in areas with large employers with shift change times outside the typical peak period. Traffic volume and travel time data can be used to analyze these variations.
- **Work trips vs. non-work trips** – to the extent possible, it is helpful to understand the balance between work-related trips and non-work trips within an area, as the strategies to address these different trip types may differ. American Community Survey data from the US Census Bureau and COMPASS commuter surveys help transportation professionals better understand these differences.

- **Crashes** – crashes are usually the main source of non-recurring congestion; therefore, it is important to determine where safety issues may be causing non-recurring congestion. ITD maintains a statewide crash database that is made available to COMPASS staff for regional analysis.
- **Construction Projects** – construction activity impedes travel and causes spillover to other corridors during major construction projects. COMPASS is working with local agencies to build a record of construction projects.
- **Traffic Volumes** – increases in traffic volumes are a common cause of congestion. Roads are designed with a certain level of service or capacity in mind; it is important to identify where volumes may have exceeded roadway design. COMPASS collects traffic volume data from its member agencies as they become available.
- **Development** – new development results in more trips generated along a corridor. Using building permit and entitlement data, it is possible to evaluate the impacts development has on the CMP network as well as to forecast what some of the impacts may be in the future due to proposed development.

Initial investigation techniques COMPASS is using to identify the causes of congestion include the following types of analyses using Geographic Information Systems and the congestion related measures:

- Overlaying multimodal system data related to high priority walking and biking system completeness
- Identifying and overlaying local major trip generators
- Overlaying readily available facility data, such as access management quality, number of travel lanes, and the type of intersection traffic controls
- Overlaying calculated crash rates by corridor or segment

Once these data overlays are applied, the composite information is used to document initial findings regarding the potential sources or critical factors associated with congestion. Another important distinction to make is between recurring and non-recurring congestion issues. However, determining what truly is recurring or non-recurring congestion is challenging and reliant upon the breadth and depth of the available data.

This investigation step serves as an essential bridge between the collection of system performance data (Step 4) and the potential solutions to address the identified deficiencies (Step 6).

Prioritizing Congested Locations and Corridors on the CMP Network

When the initial congestion analysis is completed, COMPASS staff will present the results and findings to the ROWG, who will then prioritize locations and/or corridors on the CMP network to undergo further evaluation and work toward identifying

possible congestion management strategies for implementation. The ROWG will also identify where congestion mitigation projects are already planned or funded.

The priority locations and corridors will be reevaluated and revised as new data are available each year and as part of the long-range transportation planning cycle. Other workgroups representing freight, active transportation, and public transportation will also be consulted in the process to identify priority locations and corridors where congestion is impacting those networks. Results from this step of the CMP will be reported in the *Congestion Management Annual Report*.

6. Identify and Assess CMP Strategies

After completion of data collection, performance measure reporting, congestion analysis, and determination of the congestion management needs, a range of alternative and innovative congestion management strategies will be considered for implementation at the prioritized locations and corridors. Generally, these strategies will include:

- Transportation Demand Management (TDM) and active transportation
- Intelligent Transportation Systems and Transportation System Management and Operations (ITS/TSMO)
- Transit operational improvements
- Freight and goods mobilization
- Roadway capacity improvements

These strategies are outlined in the FHWA CMP guidebook[21], are carried over from COMPASS' previous CMP, and reaffirmed through researching congestion management best practices from other MPOs.

COMPASS Congestion Management Strategies

Transportation Demand Management (TDM) and Active Transportation
TDM comprises a wide range of tactics that are meant to reduce the level of demand on the transportation system by providing alternative options of how and when people travel in order to reduce the number of trips and vehicles during congested hours of travel. Demand management strategies focus on giving travelers the information, awareness, and capability to make the most effective individual travel and commute choices, which in turn, can lead to greater overall benefits in travel time and reliability of the transportation system. This strategy supports the reliability, accessibility/mobility, efficiency/congestion reduction, and environment objectives of the CMP. These tactics are implemented through policies,

[21] *Congestion Management Process: A Guidebook*, FHWA, 2011; www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

programs/services, partnerships, technology, and infrastructure improvements. Some examples of these tactics are park and ride lots, partnerships with employers to create alternative work schedules, high-occupancy vehicle (HOV)/toll lanes, and land use policies that encourage transit-oriented design. The desired outcomes of implementing TDM tactics are to reduce vehicle miles travelled (VMT), improve travel time reliability, and decrease the number of SOVs to alleviate volume-capacity issues causing congestion and effecting travel time reliability.

The active transportation strategy is directed specifically toward making biking and walking more accessible and enticing modes of travel. This strategy supports the accessibility/mobility, connectivity, and environment objectives of the CMP. Encouraging active modes of transportation can help to alleviate demand on the roadway system during peak hours of travel. These tactics are typically implemented through infrastructure and roadway projects to add or improve accommodations for bicyclists and pedestrians. Some examples of active transportation tactics are adding new trails, sidewalks, or pathways to improve connectivity on the network, adding safety features to existing bike/pedestrian infrastructure, and improving first and last mile connections to public transit, schools, and other services/amenities.

Transportation System Management and Operations/Intelligent Transportation Systems (TSMO/ITS)

TSMO and ITS strategies aim to enhance the efficiency, reliability, and safety of the existing infrastructure. They support the reliability, safety, and efficiency/ congestion reduction objectives of the CMP. Tactics are implemented through deployment of new technologies or management tactics to improve the throughput, safety, and reliability of the transportation system. These tactics can be implemented on regional, corridor, or local scales and for many different modes of transportation. TSMO/ITS tactics tend to have a low to medium costs and are most effective when used in tandem with other CMP toolbox strategies. Some examples of ITS/TSMO projects include signal timing optimization, transit signal priority, variable speed limits, incident response vehicles, and variable messaging signs.

Transit Operation Improvements

Transit operation improvements focus on improving transit infrastructure/assets and increasing the availability of transit services. This strategy supports the accessibility/mobility and environment objectives of the CMP. The goal of this strategy is to increase transit ridership to decrease SOV travel and overall VMT. These tactics are typically implemented on a regional or corridor level and range in cost from low to high depending on the project. Examples of transit operation improvements include an increase in frequency or hours of operation, additional service routes, the addition of dedicated transit right of way, and the use of fixed guideway transit systems.

Freight and Goods Mobilization

The freight and goods mobilization strategy is directed toward moving freight and goods more efficiently through the system and supports the freight accessibility and mobility objective of the CMP. This strategy overlaps in many ways with the ITS/TSMO strategy but is targeted toward the movement of freight. These tactics can be implemented on the regional to corridor level scale and are typically low to medium cost. Example tactics include freight signal priority, improved intersection designs, designated loading zones and times, and designated freight corridors. These tactics should improve truck travel time reliability and overall congestion on the transportation system.

Roadway Capacity Improvements

Large capital projects can increase roadway capacity, but generally require significantly more capital investment than other strategies and are recommended for implementation only if other strategies are insufficient in mitigating congestion. These strategies increase vehicle capacity of roadways by building or widening new roads, bridges, over/underpasses, and/or interchanges. These strategies are typically applied to specific locations along a corridor and are characteristically high in cost. Roadway capacity improvements should improve travel times and reliability measures; however, other CMP strategies should be considered in concert with roadway capacity improvements in order to assure that the benefits are sustained after the improvements are made.

CMP Toolbox of Strategies and Tactics

The CMP Toolbox of Strategies and Tactics (Appendix A) was developed as a reference and resource for COMPASS and its member agencies. It can be used to identify the most appropriate congestion management strategies and tactics for addressing congestion issues at the regional, corridor, or project scale. It can also be used when evaluating major capacity expansion investments to identify alternative strategies or tactics that might prolong the benefits of the project.

The CMP toolbox is made of a collection of strategies and tactics identified in COMPASS plans/studies (Table 8), guidance from the FHWA CMP guidebook[22], and strategies implemented and identified by peer MPOs. The strategies and tactics in the toolkit were reviewed by COMPASS staff and workgroups to ensure they are feasible and applicable, and the information included in the CMP toolbox is valid. The CMP toolbox is updated as new strategies and tactics are identified.

[22] *Congestion Management Process: A Guidebook*, FHWA, 2011; www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

Assessing Congestion Management Strategies

Congestion management strategies and tactics are implemented through multiple projects, programs, and policies at the regional and local scale. When evaluating which strategies to implement the following criteria should be considered:

- Alignment with the goals and objectives of the long-range transportation plan and CMP.
- Fits the context of the community, corridor, facility, intersection, etc.
- Fits the context of the congestion issue.
- Viewed as feasible by the agency/jurisdiction responsible for implementation.

COMPASS Workgroups

COMPASS is a collaborative organization bringing together multiple jurisdictions to make joint decisions about regional transportation. Workgroup and committee meetings provide a forum to discuss transportation planning issues, recommend improvements to procedures and products, and prioritize regional transportation investments. Many of these workgroups are focused on a particular mode of transportation and are composed of subject matter experts from these areas. Workgroups are frequently consulted and relied upon to develop projects, programs, and policies related to the congestion management strategies. The Active Transportation, Public Transportation, Freight Advisory, and Regional Operations Workgroups support identification and development the congestion management strategies and goals and objectives of the long-range transportation plan.

The ROWG is primarily responsible for identifying and recommending appropriate congestion management strategies and tactics from the CMP toolkit. The strategies and tactics recommended by the ROWG should align with the goals and objectives of the CMP and support the CMP performance measures. Other workgroups are consulted with regards to congestion management strategies and tactics that relate to their mode/system of expertise.

The list of priority locations and corridors, congestion needs, as well as the recommended congestion management strategies and tactics identified by the ROWG and other workgroups will follow the COMPASS governance structure by moving through the Regional Transportation Advisory Committee for their review and then as a recommendation to the COMPASS Board of Directors for acceptance. The prioritized congestion needs and recommended strategies and tactics are published in the *Congestion Management Annual Report*.

Plans and Studies

COMPASS has a role to help facilitate the identification of feasible and relevant congestion management strategies for implementation. COMPASS helps facilitate

this approach using technical tools, workgroup/committee facilitation, researching best practices & innovative solutions, and staff-level technical analysis. These approaches are typically combined and conducted as studies and plans managed by COMPASS staff. These studies and plans typically result in the identification of projects, programs, strategies, and policies that support congestion management and the goals and objectives of the regional long range transportation plan. Table 8 below shows recent, current, and pending plans and studies COMPASS is responsible for.

Table 8: Recent, Current, and Pending Plans and Studies related to Congestion Management[23]

Study/Plan	CMP Strategy	Date Completed
Treasure Valley Transportation Systems Management and Operations Strategic Plan	TSMO/ITS	February 2020
COMPASS Regional Park and Ride Study	TDM	January 2021
COMPASS Freight Study	Freight and Goods Mobilization	June 2018
Treasure Valley High Capacity Transit Study Update	Transit Operations Improvement	July 2020
COMPASS Rails with Trails Feasibility and Probable Cost Study	TDM	September 2019
Complete Network Policy	All	December 2021
I-84 Corridor Operations Plan	TSMO/ITS	In progress (anticipated: March 2022)
Coordinated Human Services Plan	Transit Operation Improvement	In Progress (anticipated: August 2022)
COMPASS Transportation Demand Management Study	TDM	Planned for 2023-2024

Technical Tools and Data

To support development of congestion management projects, COMPASS maintains a robust collection of regional transportation planning data and technical planning tools, as well as a staff of experts to support member agencies in using these data and tools. COMPASS has done extensive work to create several useful regional GIS

[23] All COMPASS plans and studies can be found on the COMPASS website at www.compassidaho.org

data sets (crash locations, traffic volumes, development activity) and makes these data sets available to its member through a virtual clearinghouse called the COMPASS regional data center. The agency also maintains several web mapping applications, including a CMP webmap[24], to help agencies visualize and reference these data sets. COMPASS technical staff is also frequently consulted by its member agencies during their own project development process.

For significant roadway capacity and public transportation system projects (new routes, route extensions and/or improved frequencies) in Ada and Canyon Counties, COMPASS uses a travel demand forecast model to evaluate future travel patterns and the associated impacts, including impacts to congestion, of adding these types of projects. In addition, there are other tools used to evaluate the impacts of individual projects and strategies can have on travel times and reliability, such as micro-simulation models, traffic signal and operations software, and various sketch planning tools (Tool for Operation Benefits Cost Analysis and Crash Modification Factors Clearinghouse) used by COMPASS and its member agencies during project selection and development.

COMPASS Education Series

To facilitate dialogue and provide learning opportunities, COMPASS hosts an education series[25] where it brings speakers on a variety of topics to the Treasure Valley to share their expertise through free presentations to public and professional audiences. Many of the education series topics pertain to, or overlap with, the CMP strategies identified in this document. By sharing lessons learned, technical tools, and best practices from other regions and agencies with the public and professionals in the Treasure Valley, better and more informed decisions can be made about how, where, and when to implement the CMP strategies in the region.

7. Program and Implement CMP Strategies and Tactics

After the prioritized locations, corridors, and congestion needs (Step 5) and congestion management strategies and tactics (Step 6) have been established, the next step in the CMP is to develop an implementation plan that will move strategies and tactics from the CMP and other relevant plans and studies toward implementation.

COMPASS is responsible for implementing the CMP and supports its member agencies, including ITD, VRT, highway districts, cities, and other local land use and transportation agencies, in implementing specific congestion management strategies and tactics. The congestion needs and strategies developed by the ROWG and other COMPASS workgroups are delegated to the appropriate member agency

[24] https://compassidaho.maps.arcgis.com/apps/webappviewer/index.html?id=850393d8071e4e119c7a43ed2782a0b6

[25] www.compassidaho.org/comm/publicevents.htm

for project development. The agency with the appropriate transportation or land use jurisdiction will further develop the recommendations into specific projects (scope, design, capital and operating costs, plan/schedule, and funding). Once projects are defined, agencies then pursue funding through the appropriate avenue depending on scale, schedule, and funding source.

Implementation of CMP strategies and tactics through the regional transportation plan

The regional transportation plan contains a program of long-term regionally significant transportation projects identified to meet the anticipated needs of the transportation system 20 - 30 years into the future, including projects to manage congestion identified through the CMP process.

In addition to funded projects, the regional transportation plan identifies and prioritizes unfunded transportation needs.

The transportation goals and objectives from the regional transportation plan are foundational to the objectives and performance measures used in the CMP. Many of the performance measures and performance criteria from these two processes overlap, creating a direct alignment between the identification of congestion and the prioritization of the transportation needs documented in the regional transportation plan. The CMP supports the regional planning process by defining a methodology for identifying long-term congestion needs and providing a toolbox of congestion management strategies/solutions, a set of congestion criteria to evaluate/rank transportation needs, and a monitoring/reporting procedure to track the effectiveness of congestion management strategies and the progress made toward the CMP and long-range transportation plan objectives. It is important to note that the congestion criteria and measures are just one set of factors that are used to evaluate and prioritize the long-term transportation needs.

Implementation of CMP strategies and tactics through the transportation improvement program (TIP)

The TIP is a short- to mid-range (7-year) capital improvement program (budget) of transportation projects consistent with federal regulations and regional policies and strategies. The TIP lists all projects for which federal funds are anticipated, along with non-federally funded projects that are regionally significant. All projects funded in the TIP must be consistent with the long-range transportation plan. Projects identified and developed through the CMP that are funded in the near- to mid-term (within 7 years) are budgeted through the TIP process.

The TIP is developed annually through a cooperative prioritization process facilitated by COMPASS. COMPASS manages the Surface Transportation Block Grant programs for the Boise and Nampa Urbanized Areas and the Transportation

Alternatives Program for the Boise Urbanized Area. The project selection process for these programs begins each winter when COMPASS accepts project applications. Information about each project is compiled by COMPASS staff, including congestion data from the CMP. Project applications are then ranked by members of the Regional Transportation Advisory Committee using a process approved by the COMPASS Board of Directors. Committee members use congestion data, CMP performance measures, and performance measures from the long-range transportation plan as data points to consider when ranking projects for the draft TIP. Congestion measures are available through a web mapping application showing the latest congestion analysis and are made available for viewing during the ranking process.

Programs managed by other agencies (ITD, VRT, and the Local Highway Technical Assistance Council) follow their own agency's project application and prioritization processes. The congestion and performance data from the CMP and the strategies for mitigating congestion are available for these agencies to use in their planning processes.

These prioritization processes are used to develop a draft TIP, which is provided for agency and public feedback prior to being presented to the COMPASS Board of Directors for action.

The current funding policy allows anticipated funding in Ada and Canyon Counties to strategically address regional priorities including capacity, or widening, improvements. Use of the Surface Transportation Block Grant (STBG) funding in Ada County continues to have a more direct focus on maintaining the existing network and filling gaps in the alternative transportation system, although new funding may be used strategically to address other regional priorities. STBG funding in Canyon County is more flexible and can be used to cover all types of transportation needs.

COMPASS supports implementation of the CMP strategies by dedicating funds each year in the TIP to marketing and operations of ACHD's Commuteride program and by dedicating STBG funds for pathways and public transportation capital projects in Ada County and alternative transportation projects in Canyon County. There is also a set-aside in the STBG programs in Ada and Canyon Counties for Safe Routes to School Education programs. Transportation Alternatives Program funds are programmed to other alternative transportation projects through the statewide and Ada County competitive program. No funding is available from Congestion Mitigation/Air Quality program dollars. This leaves only a small percentage of federal funding for implementing congestion mitigation projects. To maximize the impacts on congestion that this small amount of funds will have, COMPASS will incorporate the CMP congestion criteria, monitoring, and reporting information into the TIP project evaluation/prioritization process.

Implementation of CMP strategies and tactics through local capital improvement programs

Smaller localized projects identified through the CMP are implemented through local capital improvement programs. At the local transportation planning level, the congestion information and analyses from the CMP and the *Congestion Management Annual Report* can be used as resources to support detailed planning, analyses, and project development. The information can also be used to help identify congested roadways and corridors and possible congestion mitigation strategies and provide insight into how mitigation strategies have performed in the past and might perform in the future.

Project Development Program and Communities in Motion Implementation Grants

The COMPASS Project Development Program was developed to assist COMPASS member agencies in securing transportation funding. The funds in this program are directly managed and programmed by COMPASS. The program transforms member agency needs into well-defined projects with cost estimates, purpose and need statements, environmental scans, and public involvement plans to ensure readiness for federal funding applications. Projects identified through the CMP process that may not be fully developed can leverage this program to ensure that the project is well-defined. Well-defined and scoped projects strengthen grant applications and, once funded, increase the probability of projects being delivered on time and on budget. Since its inception, several bicycle and pedestrian infrastructure projects (active transportation strategies) have been developed through this program; however, the program can be used to support the development of projects supporting any of the five CMP strategies.

The *Communities in Motion Implementation Grant* program supports COMPASS member agencies in implementing *Communities in Motion*[26], the regional long-range transportation plan for Ada and Canyon Counties. The grant program provides direct support for locally important projects, including CMP projects, that also help reinforce the regional goals established in *Communities in Motion*.

[26] www.compassidaho.org/prodserv/reglrtranpl.htm

CMP Project Lifecycle

Congestion needs identified in the CMP ultimately turn into projects and move into implementation (*Figure 6*).

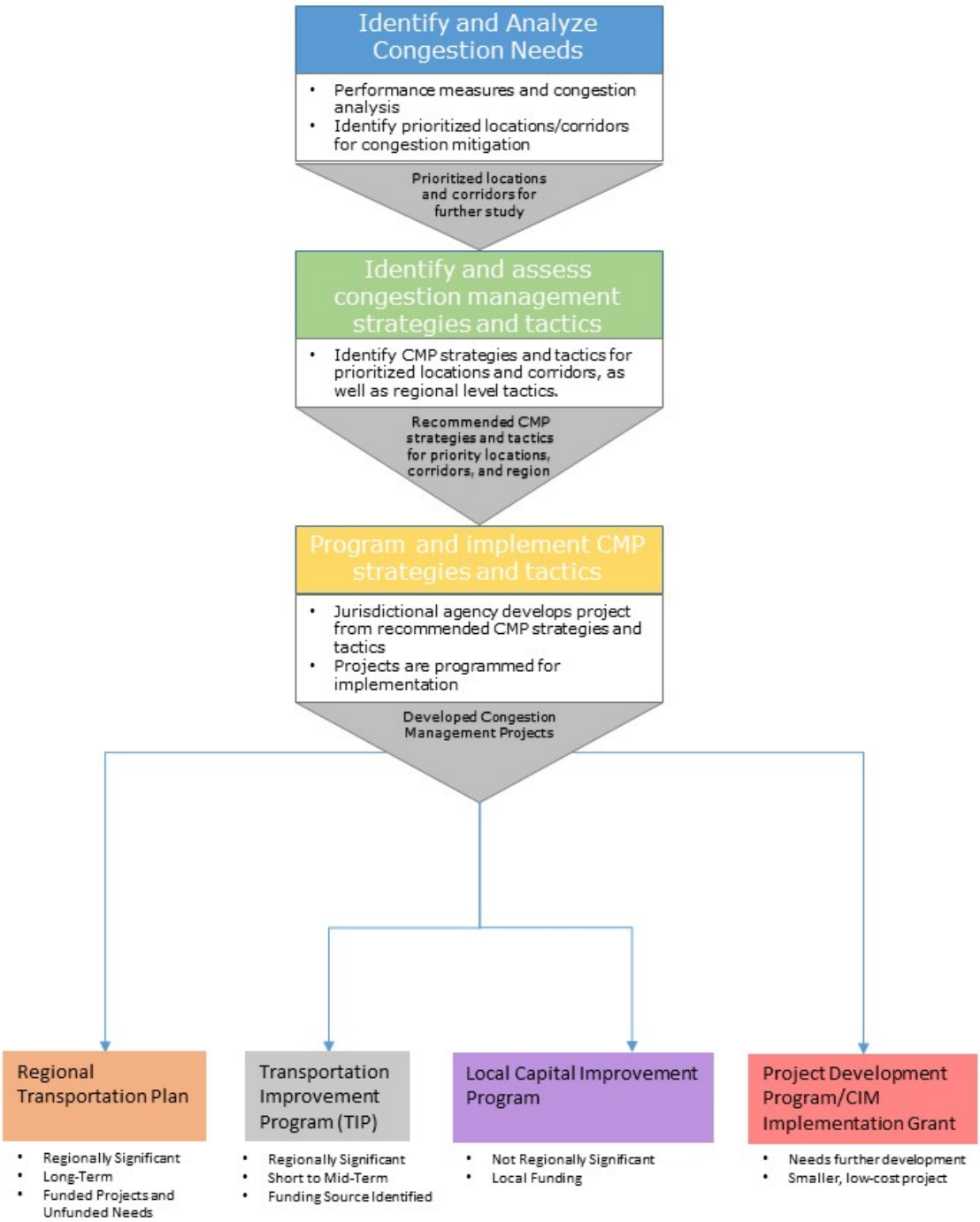

Figure 6: Summary of CMP Project Lifecycle

8. Evaluate Strategy Effectiveness

All mature processes include a means for assessing how effective they are at achieving their goals and objectives. The final step of the CMP is a feedback mechanism to spur constant improvement and changes to make the CMP more efficient and effective. The purpose of this step is to determine if the implemented CMP strategies are impacting congestion as desired.

For this step in the process, two general approaches are used:

(1) **System-level performance evaluation** – a regional analysis of multi-year trends to identify improvement or degradation in system performance using the CMP performance measures in relation to objectives. The data sets listed in Step 4, "Collect Data and Monitor Performance," are used to support this analysis on an annual basis.

(2) **Strategy effectiveness evaluation** – a project- or program-level analysis of conditions before and after the implementation of a congestion mitigation strategy. COMPASS will analyze the effectiveness of all significant operational and through-lane capacity projects on the CMP network with regards to mitigating congestion. The measures and data documented in Steps 3 and 4 are used for these evaluations. For other types of congestion management projects, COMPASS will analyze performance as available funding and data allow. These types of analyses are typically more difficult to conduct and require additional data gathering and technical expertise.

    Additionally, COMPASS workgroups, such as the ROWG, are asked to communicate successes, failures, and lessons learned from implementing the strategies listed in the CMP toolkit. This interagency communication can be useful to other transportation agencies in the region considering implementing new congestion management tools.

The evaluation completed in this step of the process will help guide decisions regarding future congestion management goals, objectives, and strategies. The findings of these evaluations are reported in the *Congestion Management Annual Report*.

Summary and Conclusion

The CMP is a vital part of the regional transportation planning process, as outputs from the CMP provide implementing agencies with a "one stop shop" of information about the performance of the transportation system and the strategies available to mitigate congestion. This update to COMPASS' 2005 CMP plan aligns with the eight CMP elements described in FHWA's *Congestion Management Process: A Guidebook* [27]and documents COMPASS' approach to the congestion management process, including incorporating expanded congestion measures and new data sources to monitor congestion and track progress toward meeting performance goals. The CMP performance measures will be reported on a biennial basis in the *Change in Motion Scorecard.* The results of the congestion analysis and identified congestion management needs and strategies will be documented in the *Congestion Management Annual Report.* The process documented in this plan is subject to change as additional data sources become available, new goals or objectives for congestion management are established, or steps in the process mature.

[27] *Congestion Management Process: A Guidebook*, FHWA, 2011; www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

Appendix A: CMP Toolkit of Strategies and Tactics

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
Transportation Demand Management Strategies (TDM) / Active Transportation Providing travelers with more options of how and when they can commute to reduce the number of trips during congested hours							
TDM-1	**Active transportation accommodations** – Facilities and infrastructure meant to accommodate people using active transportation to commute. Examples include bike parking, changing rooms, showers, bike repair stations, and wayfinding.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Regional • Corridor • Project	• Mobility • Efficiency	• Cities • Counties • Highway Districts • Employers	• Surface Transportation Block Grant (STBG) • Transportation Alternatives Program (TAP) • Federal Transit Administration (FTA) • Federal competitive grants • Private grants/partnerships	
TDM-2	**Education / outreach –** Campaigns, publications, and advertising to help inform the public of their transportation choices. Examples include information kiosks, new resident/employee transportation brochures, travel planning assistance, etc.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Regional • Project	• Mobility • Efficiency • Safety	• Cities • Counties • Employers • Transit Agencies • COMPASS • Non-Profit Organizations • Highway Districts	• STBG • Consolidated Planning Grant • Private grants/partnerships	
TDM-3	**Employer-based transportation incentives –** Programs implemented by employers to incentivize a change in travel behavior to help relieve congestion. Examples include teleworking, alternative work hours, designating an employee transportation coordinator, etc.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Regional	• Mobility • Efficiency	• Employers • Transit Agencies	• Private grants/partnerships • Local funds	
TDM-4	**Park and ride lots –** Facilities and infrastructure that allow for commuters to leave their vehicles or bicycles in a designated location and connect with public transit or rideshares (carpool, vanpool) for the remainder of their commute.	**Cost:** Low to Medium **Implementation**: Short-term (1-5 years)	• Corridor • Regional	• Mobility • Efficiency	• Cities • Counties • Transit Agencies • Highway Districts • Idaho Transportation Department (ITD) • Employers • Colleges/universities	• STBG • FTA • Local funds • Private grants/partnerships • Business improvement districts • Impact fees • Public/private partnerships	• COMPASS Regional Park and Ride Study[28]

[28] www.compassidaho.org/documents/prodserv/reports/FinalReport_COMPASS_Park&Ride_FINAL_20210203.pdf

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
TDM-5	**Parking management –** Infrastructure and programs to make parking more efficient and convenient. Examples include paid parking, shared parking, high-occupancy vehicle (HOV) parking, Transportation Network Company loading/unloading zones, and freight loading/unloading zones.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Project	• Efficiency	• Cities • Counties	• STBG • Federal freight funds • Local funds • Private grants/partnerships	
TDM-6	**Transit oriented development / infill and densification –** Development or redevelopment in areas with existing infrastructure and services and comingling residential and commercial land uses to reduce trips made to access goods and services.	**Cost**: Variable **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Regional • Corridor • Project	• Mobility • Efficiency	• Cities • Counties	• STBG • FTA • Federal competitive grants • Local funds • Private grants/partnerships	• State Street Transit-Oriented Development Plan[29] • Compact Housing Guidebook[30]
TDM-7	**Transportation subsidies –** Programs to help make transportation more affordable. Examples include bike/car share memberships, carpool incentives, free/discounted transit, Transportation Network Company discounts, etc.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Regional • Project	• Mobility • Efficiency	• Cities • Counties • Transit Agencies • Employers	• STBG • FTA • Local funds • Private grants/partnerships	
TDM-8	**Walk / bike infrastructure –** Infrastructure and programs specifically designed to support low stress walking and biking networks, such as sidewalks, bike parking, bike lanes, pathways, greenbelts, and Safe Routes to School programs. Includes several opportunities to build new pathways along existing infrastructure such as canals and the Union Pacific railway.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Project • Corridor • Regional	• Mobility • Efficiency • Safety	• Cities • Counties • Highway Districts • ITD	• STBG • TAP • FTA • State and local funds • Private grants/partnerships	• COMPASS Rails with Trails Feasibility and Probable Cost Study[31] • COMPASS Bike Walk Application[32]
TDM-9	**First / last mile connections to transit –** Infrastructure or mobility services such as bike shares, automated shuttles, scooter shares, on-demand transit, and other solutions for making connections to transit more convenient and accessible.	**Cost:** Low to Medium **Implementation**: Short-term (1-5 years)	• Corridor • Regional	• Mobility	• Cities • Counties • Highway Districts • ITD • Private Sector	• STBG • TAP • FTA • State and local funds • Private grants/partnerships	

[29] https://www.compassidaho.org/prodserv/specialprojects-sstod.htm
[30] https://www.compassidaho.org/dashboard/pdfs/CompactHousingGuidebook.pdf
[31] www.compassidaho.org/documents/prodserv/CIM2040_20/COMPASS_FINAL_RWT_COST_STUDY_090419_web.pdf
[32] https://compassidaho.maps.arcgis.com/apps/webappviewer/index.html?id=8a567a39377a46bfb7e38f8172261809

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
Intelligent Transportation System (ITS) / Transportation System Management and Operations (TSMO) Implementing improvements focused on optimizing the current transportation infrastructure							
TSMO-1	**Access management / turn restrictions –** Managing access to parcels adjacent to major roads or restricting hazardous turn movements to improve safety and efficiency.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Project • Corridor • Regional	• Efficiency • Safety	• Cities • Counties • Highway Districts • ITD	• STBG • Highway Safety Improvement Program (HSIP) • State and local funds	• Treasure Valley TSMO Strategic Plan[33]
TSMO-2	**Arterial management –** Strategies to improve arterial travel times, reliability, and safety. Examples include enhanced traffic signal operations/synchronization/ performance monitoring and bike and pedestrian safety devices.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Corridor • Regional	• Efficiency • Safety • Mobility	• Cities • Highway Districts • ITD	• STBG • TAP • HSIP • National Highway Performance Program (NHPP) • State and local funds	• Treasure Valley TSMO Strategic Plan
TSMO-3	**Network surveillance –** Infrastructure enabling remote monitoring of real-time traffic conditions and/or traffic data collection. Examples include cameras, speed detectors, automatic traffic counters, bike and pedestrian counters, fiber, etc.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years) - medium-term (6-10 years)	• Project • Corridor • Regional	• Efficiency • Mobility	• Cities • Highway Districts • ITD	• STBG • Federal competitive grants • State and local funds	• Treasure Valley TSMO Strategic Plan
TSMO-4	**Emerging technologies –** Developing infrastructure necessary for emerging technologies such as connected and automated vehicles or electric vehicles. Examples include expanding fiber optics networks and upgrading traffic signals.	**Cost**: Medium **Implementation**: Medium-term (6-10 years)	• Regional	• Efficiency • Safety	• All Agencies	• STBG • Federal competitive grants • State and local funds	• Treasure Valley TSMO Strategic Plan
TSMO-5	**Freeway management –** Strategies to improve freeway travel times, reliability, and safety. Examples include ramp metering, high occupancy vehicle lanes, variable speed limits, and safety service patrol trucks.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Efficiency	• ITD	• STBG • NHPP • HSIP • State funds • Grant Anticipated Revenue Vehicle (GARVEE) bonds • Federal competitive grants	• Treasure Valley TSMO Strategic Plan • I-84 Corridor Operations Plan
TSMO-6	**Incident and emergency management –** Plans, programs, and assets targeted at improving the efficiency of emergency response. Examples include emergency vehicle routing and preemption, regional alert systems, and regional incident and emergency management programs.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Regional	• Safety • Efficiency	• ITD	• HSIP • State funds • Federal competitive grants	• Treasure Valley TSMO Strategic Plan

[33] www.compassidaho.org/documents/prodserv/tsmo/COMPASSTSMOPlan_FINAL.pdf

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
TSMO-7	**Intersection and interchange improvements –** Reconfiguring existing intersections/interchanges to move traffic more efficiently. Examples include roundabouts and continuous flow intersections.	**Cost**: Medium to High **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Project • Corridor	• Efficiency • Safety	• Cities • Counties • Highway Districts • ITD	• STBG • NHPP • HSIP • GARVEE bonds • State and local funds • Federal competitive grants	• Treasure Valley TSMO Strategic Plan
TSMO-8	**Maintenance and Construction Management –** Assets, technology, and plans to minimize the impact of road construction on travel. Examples include work zone management, encouraging/ advertising/incentivizing public transit, and construction/maintenance coordination.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Regional	• Efficiency • Safety	• Cities • Counties • Highway Districts • ITD	• Federal planning • State planning	• Treasure Valley TSMO Strategic Plan
TSMO-9	**Regional transportation operations, coordination, and management –** Regional approach for ensuring operations on the system are efficiently coordinated. Examples include traffic and closed-circuit television monitoring and multi-agency operations plans.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Efficiency	• Cities • Highway Districts • ITD	• HSIP • Federal competitive grants • State and local funds • Private grants/partnerships	• Treasure Valley TSMO Strategic Plan
TSMO-10	**Road conditions monitoring –** Technologies, assets, and plans for minimizing the impacts of weather on travel. Examples include weather data collection, weather adaptive traffic management, and winter roadway maintenance.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Regional	• Efficiency • Safety	• Highway Districts • ITD	• State and local funds • Federal competitive grants • Private grants/partnerships	• Treasure Valley TSMO Strategic Plan
TSMO-11	**Traffic calming / road diets –** Reconfiguring roadways to improve safety of all modes. Examples include narrower lanes, speed bumps, and islands/medians.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years)	• Project • Corridor	• Safety	• Cities • Counties • Highway Districts • ITD	• STBG • HSIP • State and local funds • Federal competitive grants	• Treasure Valley TSMO Strategic Plan
TSMO-12	**Traveler information –** Assets to help direct travelers away from hazards and along the most efficient route. Examples include roadside traveler information, regional traveler information, and trip planning and routing.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Efficiency	• Cities • Counties • Highway Districts • ITD	• Federal planning • State and local funds • Federal competitive grants • Private grants/partnerships	• Treasure Valley TSMO Strategic Plan
Transit Operation Improvement Strategies Improving transit operations, access, and services to encourage transit use to reduce the number of vehicles on the road							
TOI-1	**Dedicated transit rights-of-way –** Reserved travel lanes for transit operations. Examples include bus-on-shoulder lanes and HOV lanes.	**Cost**: Medium to High **Implementation**: Medium-term (6-10 years)	• Corridor • Regional	• Mobility • Efficiency	• Transit Agencies • ITD • Highway Districts	• FTA • State and local funds	• State Street Transit and Traffic Operational Plan[34]

[34] https://static1.squarespace.com/static/5bc60452ca525b659d539367/t/5bca4dd4652dea920a32944d/1539984884140/9260_ImplementationPlan_Final_June2011.pdf

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
TOI-2	**Fixed guideway transit –** Exclusive travel way dedicated to transit. Examples include bus rapid transit, light rail, and commuter rail.	**Cost**: High **Implementation**: Long-term (>10 years)	• Corridor • Regional	• Mobility • Efficiency	• Transit Agencies • ITD	• FTA • State and local funds • Federal competitive grants	• Treasure Valley High Capacity Transit Study 2020 Update[35]
TOI-3	**Improved transit stops / stations / amenities –** Investments to make the commuting experience better by providing amenities such as shelters, seating, bike parking, real time schedule displays, and arrival time information.	**Cost**: Medium **Implementation**: Short-term (1-5 years)	• Corridor • Regional	• Mobility • Efficiency	• Cities • Transit Agencies	• FTA • State and local funds • Private grants/partnerships	
TOI-4	**Public transportation management –** Tools used to improve the efficiency of public transportation. Examples include advanced transit operations tools, regional fare integration, real-time transit information, transit signal priority, and mobility-as-a-service.	**Cost**: Low to Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Mobility • Efficiency	• Transit Agencies • Highway Districts	• FTA • Local funds • Federal competitive grants • Private grants/partnerships	• Treasure Valley TSMO Strategic Plan[36]
TOI-5	**Transit intersection improvements –** Infrastructure to support movement of transit through intersections more efficiently. Examples include queue jump and or/bypass lanes.	**Cost**: Medium to High **Implementation**: Medium-term (6-10 years)- Long-term (>10 years)	• Project • Corridor	• Mobility • Efficiency	• Cities • Highway Districts • ITD • Transit Agencies	• FTA • State and local funds • Federal competitive grants	
TOI-6	**Increased transit service or expanded routes –** Increasing frequencies or service hours or expanding geographies of bus routes to optimize ridership and accommodate new growth.	**Cost**: Medium to High **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Mobility • Efficiency	• Transit Agencies	• FTA • Local funds • New funding sources	
Freight and Goods Mobilization Implementing strategies to move freight and goods more efficiently through the transportation system							
FR-1	**Freight or truck signal priority –** Extra green light time for trucks and other freight vehicles to allow them to move through a traffic signal without stopping.	**Cost**: Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Efficiency • Mobility	• Cities • Counties • Highway Districts • ITD	• Federal freight funds	• Treasure Valley TSMO Strategic Plan
FR-2	**Freight-supportive intersection / interchange design –** Intersections and interchanges on freight corridors designed to accommodate the turning radii of freight vehicles.	**Cost**: Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Project • Corridor	• Safety • Efficiency	• Cities • Counties • Highway Districts • ITD	• Federal freight funds	• COMPASS Freight Study[37]

[35] www.compassidaho.org/documents/planning/studies/Treasure_Valley_High_Capacity_Transit_Study_2020_Update_Final0907.pdf
[36] www.compassidaho.org/documents/prodserv/tsmo/COMPASSTSMOPlan_FINAL.pdf
[37] www.compassidaho.org/documents/prodserv/CIM2040_20/COMPASS%20Freight%20Study%20Final%20Report_June%202018.pdf

Strategy #	Strategy	Cost / Implementation Time	Applicable Scale	Congestion Impacts	Implementing Organizations	Potential Funding Sources	References / Planning Documents
FR-3	**Designated freight delivery zones and times –** Specified zones and times for when and where freight can be delivered. Freight delivery zones should be considered for both truck and rail.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Project	• Efficiency	• Cities	• Federal freight funds	
FR-4	**Truck lane designations and restrictions –** Truck lane designations and restrictions that separate or restrict trucks into designated lanes.	**Cost**: Low **Implementation**: Short-term (1-5 years)	• Corridor • Regional	• Efficiency • Safety	• Cities • Counties • Highway Districts • ITD	• Federal freight funds	
FR-5	**Weigh-in-motion –** Systems that measure the weight of trucks while they are moving to identify which vehicles are overweight, so that weight overload penalties can be enforced. Underweight vehicles can bypass the weigh station, while overweight vehicles are directed to another location for additional weighing.	**Cost**: Medium **Implementation**: Short-term (1-5 years) to medium-term (6-10 years)	• Corridor • Regional	• Efficiency	• ITD	• Federal freight funds	• Treasure Valley TSMO Strategic Plan[38]
Roadway Capacity Improvement Strategies Expanding capacity by adding lanes, new roads, or improving intersections							
RC-1	**Additional lanes with road widening –** Addition of new lanes to increase system capacity and throughput.	**Cost**: Medium to Very High **Implementation**: Medium-term (6-10 years) to long-term (>10 years)	• Project • Corridor	• Efficiency	• Cities • Counties • Highway Districts • ITD	• STBG • NHPP • HSIP • GARVEE bonds • State and local funds • Federal competitive grants	
RC-2	**New roadway construction –** Addition of new infrastructure to the existing network.	**Cost**: High to Very High **Implementation**: Medium-term (6-10 years) to long-term (>10 years)	• Project	• Efficiency	• Cities • Counties • Highway Districts • ITD	• STBG • NHPP • HSIP • GARVEE bonds • State and local funds • Federal competitive grants	

[38] www.compassidaho.org/documents/prodserv/tsmo/COMPASSTSMOPlan_FINAL.pdf

Appendix B: CMP Measures Definitions and Methodologies

CMP Performance Measures Definitions and Methodologies

Performance Measure	Definition	Methodology	Data
Truck Travel Time Reliability on Interstate system	Length weighted overall reliability measure for freight on the interstate system.	Follow methodology in on page 6045 of FHWA Register https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf	NPMRDS or other segment-based travel time data source
Percent of reliable vehicle-miles traveled on interstate and non-interstate NHS	Percentage of person miles traveled (average annual daily traffic X occupancy X segment length) on the interstate and non-interstate NHS considered reliable for the year. Reliability for a roadway is calculated by comparing the 80th percentile travel time to the 50th percentile travel time for peak periods for the year.	Follow methodology in on page 6044 of FHWA Register https://www.gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf	NPMRDS or other segment-based travel time data source, traffic counts, Highway Performance Monitoring System
Transit reliability (% of trips delivered on time)	Percentage of stops on fixed route transit with arrivals no later than 5 minutes past scheduled and departures no earlier than scheduled for the reporting period.	Calculated by VRT using fleet tracking technology	On-time performance data set
Number auto of fatalities#	Five-year rolling average of auto fatalities. This number excludes bicycle and pedestrian fatalities related to autos.	Number: (Number of fatalities for the most recent 5 consecutive calendar years ending in year for which targets are established) / 5	State crash data
Number of people injured in auto crashes#	Five-year rolling average of auto serious injuries. This number excludes bicycle and pedestrian serious injuries related to autos.	Number: (Number of serious injuries for the most recent 5 consecutive calendar years ending in year for which targets are established) / 5	State crash data
Rate of auto fatalities#	Five-year rolling average of the rate of auto fatalities. The rate is calculated by auto fatalities per 100,000,000 vehicle miles traveled in Ada and Canyon Counties.	Rate: (Fatality rate per 100 million VMT for each of the most recent 5 consecutive years ending in year for which targets are established) /5	State crash data, annual VMT
Rate of auto serious injuries#	Five-year rolling average of the rate of auto serious injuries. The rate is calculated by auto serious injuries per 100,000,000 vehicle miles traveled for the year in Ada and Canyon Counties.	Rate: (Serious injury rate per 100 million VMT for each of the most recent 5 consecutive years ending in year for which targets are established) /5	State crash data, annual VMT
Non-motorized fatalities and serious injuries#	Five-year rolling average of bicycle and pedestrian fatalities and serious injuries.	(Number of non-motorized fatalities + number of non-motorized serious injuries for the most recent 5 consecutive calendar years ending in year for which targets are established) / 5	State crash data
Total injury crashes	Five-year rolling average number of auto crashes involving injury for the reporting period.	(Sum of all injury accidents for most recent 5 consecutive calendar years)/5	State crash data
Job accessibility (Auto)	Average number of jobs accessible by automobile within 15 minutes on average weekday from all TAZs in the travel demand model.	Output from COMPASS regional travel demand model	Travel demand model, employment data
Job accessibility (Transit)	Average number of jobs accessible by transit within 30 minutes on average weekday from all TAZs in the travel demand model.	Output from COMPASS regional travel demand model	Travel demand model, employment data

Performance Measure	Definition	Methodology	Data
Vanpools	Average number of vanpools operating for the year.	Provided by ACHD Commuteride	Number of vanpools operating
Households near transit	Percent of total households in Ada and Canyon counties within ½ mile network distance of an existing ValleyRide stop.	a) Create 0.5-mile buffer polygon in GIS around transit stops. b) Select TAZs that intersect transit stop buffers. c) Total the number of jobs in TAZs intersecting transit stop buffers. (Jobs in service area/total jobs in region) X 100	Transit stops, TAZs
Transit passenger ridership	Number of passengers for the year on fixed route transit. Data come from Valley Regional Transit's automatic passenger counters.	Provide by VRT	Automatic passenger counter data
Annual percentage of non-SOV work trips	Percentage of total trips to work that are not taken in an SOV.	Sum of non-SOV commutes/total commutes X 100	Latest American Community Survey "Journey to Work" data
Walkability: Public Schools	Percentage of households within ½ mile distance of a school that can access the school using the walkable network (½ mile walk)	a) Create 0.5-mile service area polygons in GIS using COMPASS walking network around school access points. b) Create 0.5-mile buffer polygons in GIS using school access points. c) Total the number of households in TAZs intersecting school access service area. d) Total the households intersecting the 0.5-mile school access points buffer (Total households in school access points service area/total households in school access points buffer) X 100	School access points, COMPASS walkable network, TAZs
Walkability: Transit stops	Percentage of households within ½ mile distance of a transit stop that can access the stop using the walkable network (½ mile walk)	a) Create 0.5-mile service area polygons in GIS using COMPASS walking network around transit stops. b) Create 0.5-mile buffer polygons in GIS using transit stops. c) Total the number of households in TAZs intersecting transit stops service area. d) Total the households intersecting the 0.5-mile transit stops buffer (Total households in transit stops service area/total households in transit stops buffer) X 100	Transit stops, COMPASS walkable network, TAZs
Walkability: Regional Activity Centers	Percentage of total households in or within ½ mile network distance of a regional activity center.	a) Create 0.5-mile service area polygons in GIS using COMPASS walking network and regional activity center access points. b) Create 0.5-mile buffer polygons in GIS using the regional activity center access points. c) Total the number of households in TAZs intersecting regional activity center service area. d) Total the households intersecting the 0.5-mile regional activity center access points buffer (Total households in regional activity center service area/total households in regional activity center buffer) X 100	Regional activity center access points, COMPASS walkable network, TAZs
Percentage of roadway miles considered highly congested	Percent of roadway miles with travel time index (TTI = Peak Hour Congested Travel Time/Free Flow Travel Time) > 2 for Tier 1 congestion management network. Data come from the NPMRDS set and includes interstate, state highway, and other facilities designated as National Highway System.	Sum of miles of roadway with TTI > 2 during any of the AM, afternoon, PM, or weekend peaks/total miles of Tier 1 network	NPMRDS, travel time data set
Number of "event" days on the interstate	Number of weekdays in a year with congestion on I-84/I-184 causing a 30% longer commute from Caldwell/Boise (AM peak) or Boise/Caldwell (PM peak). Current commute times average about 30 minutes for both the AM and PM peak hours.	a) Calculate average commute time east/westbound for year of measure from Caldwell to Boise using NPMRDS. b) Calculate average AM and PM commute times for every day of the year east/westbound. c) Identify total number of days where either the AM or PM commute was greater than 30% longer than the annual average commute time.	NPMRDS, travel time data set
Annual hours of peak hour excessive delay per capita[#]	Total hours of excessive delay (20mph slower or 60% of the posted speed limit) during peak travel time (weekdays 6am-10am and 3pm-7pm) calculated per capita for the Boise Urbanized Area.	Methodology described here: https://www.fhwa.dot.gov/tpm/guidance/hif18040.pdf (2-18)	NPMRDS, vehicle occupancy, peak hour traffic volumes, demographics

Performance Measure	Definition	Methodology	Data
Non-SOV mode share[#]	Percentage of commutes completed using modes other than single occupancy vehicle for five-year period based on American Community Survey estimates for Boise Urbanized Area.	Methodology described here: https://www.fhwa.dot.gov/tpm/guidance/hif18024.pdf (pg.12)	American Community Survey
Bicycle/pedestrian volumes	Average of annual volumes from selected fixed bike pedestrian counters.	Counts are totaled each year from a set of geographically distributed fixed automated bicycle/pedestrian counters to get an overall feel for usage of the pathways and trails system.	Bicycle/pedestrian counter data
Percentage of roadway (arterial/collectors) with bicycle lanes/multiuse pathways	The percentage of arterial and collector roadway that have existing bikeways as defined as a division of a road marked off with painted lines, for use by cyclists, not including sharrows or other markings within automobile lanes or multiuse pathways that allow for bicycle travel.	a) Calculate total miles of arterial and collector centerline b) Calculate centerline miles of arterial and collector roadways with bike lanes or a multiuse pathway (Centerline miles of arterials/collectors with bike lane or multiuse pathway/total centerline miles of arterial/collector) X 100	Regional centerline data set

[#] Federal Performance Measure

CMP Congestion Measures Definitions and Methodologies

Congestion Measure	Definition	Methodology	Data
Travel Time Index (TTI)	TTI is a measure of congestion intensity. TTI is calculated using the measured travel time divided by the free flow time. For example, a measured travel time of 3 minutes divided by free flow travel time of 1.5 minutes (3 min/1.5 min) yields a TTI of 2.0. TTI is effective at measuring the intensity of recurring congestion that occurs on a roadway.	Measured travel time/free flow travel time	NPMRDS or other segment-based travel time data source
Level of Travel Time Reliability (LOTTR)	A measure of how consistent travel times are week to week and month to month, based on the ratio of the longer recorded travel times (80th percentile) to a "normal" travel time (50th percentile). A LOTTR score of 1.5 means that it can take 50% longer to travel a segment of roadway at times of the worst congestion.	Follow methodology in on page 2-8 of FHWA document: https://www.fhwa.dot.gov/tpm/guidance/hif18040.pdf 80th percentile travel time/50th percentile travel time	NPMRDS or other segment-based travel time data source
Truck Travel Time Reliability (TTTR)	A measure of how consistent travel times are week to week and month to month, based on the ratio of the longer recorded travel times (95th percentile) to a "normal" travel time (50th percentile). A TTTR score of 1.5 means that it can take 50% longer to travel a segment of roadway at times of the worst congestion.	Follow methodology in on page 2-15 of FHWA document: https://www.fhwa.dot.gov/tpm/guidance/hif18040.pdf 95th percentile travel time/50th percentile travel time	NPMRDS or other segment-based travel time data source
Average weekday hours of congestion (HOC)	The duration of traffic congestion (in time) capturing the average number of hours per workday (non-holiday weekday) that the motorist will experience congestion.	a) Calculate weekday hourly average TTI for each reporting segment. b) HOC = Number of hours on average weekday with TTI >2.0 for a reporting segment.	NPMRDS or other segment-based travel time data source