Roadways

Communities in Motion 2040 2.0 (CIM 2040 2.0) focuses on four transportation system components—roadways, public transportation,[1] freight,[2] and bicycle/pedestrian (active transportation)[3]—and how they integrate to comprise a complete transportation system.

FUNCTIONAL CLASSIFICATION

Roads are classified by how they function within a transportation system—called their "functional classification."[4] For example, local streets are intended to serve residential areas, not heavy through traffic, while interstate highways are designed for heavy traffic and high speeds. Classification is determined by the service a road supplies, not simply by the size of the road or the amount of traffic it carries. This means roads that look similar may have different functional classifications because they are serving different needs.

Functional classification is determined based on a range of how a road provides mobility and access (Figure 1). Mobility is determined by vehicular speed and distance of the roadway without interruptions; its focus is moving travelers from point A to point B in the most efficient way. Arterial roads, highways, and interstates are good examples of roadways with high mobility because they move larger volumes of vehicles, at higher speeds, with fewer access points than other types of roads. Access is determined by the frequency of entry and exit opportunities on a road; local and collector roads typically provide better access because they have more intersections and driveways.

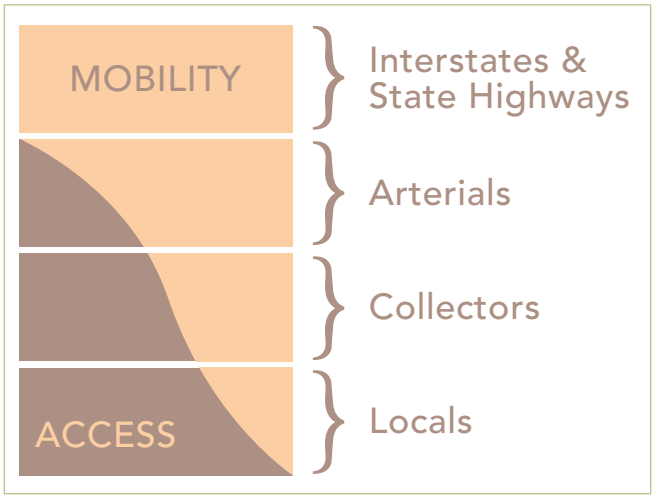

Figure 1. Functional classification is based on a continuum of mobility vs. access.

Fifty-six percent of Ada and Canyon Counties' nearly 12,000 lane miles of roadways are on local streets (Figure 2). However, over 70% of traffic (in terms of vehicle miles traveled, or "VMT") is on the interstate, state highways, and principal arterials, which account for only 18% of the lane miles.

Functional classification helps in prioritizing needs, determining the appropriate type and frequency of access to adjacent land uses, and determining whether federal funds can be used for a project on that roadway. The 2040 functional classification map[5] shows interstate and arterial roadways as they are planned for the year 2040. Local and collector streets are not included. The map corresponds to the roadways that were included in analyses for determining funding priorities[6] and in the air quality conformity demonstration.[7]

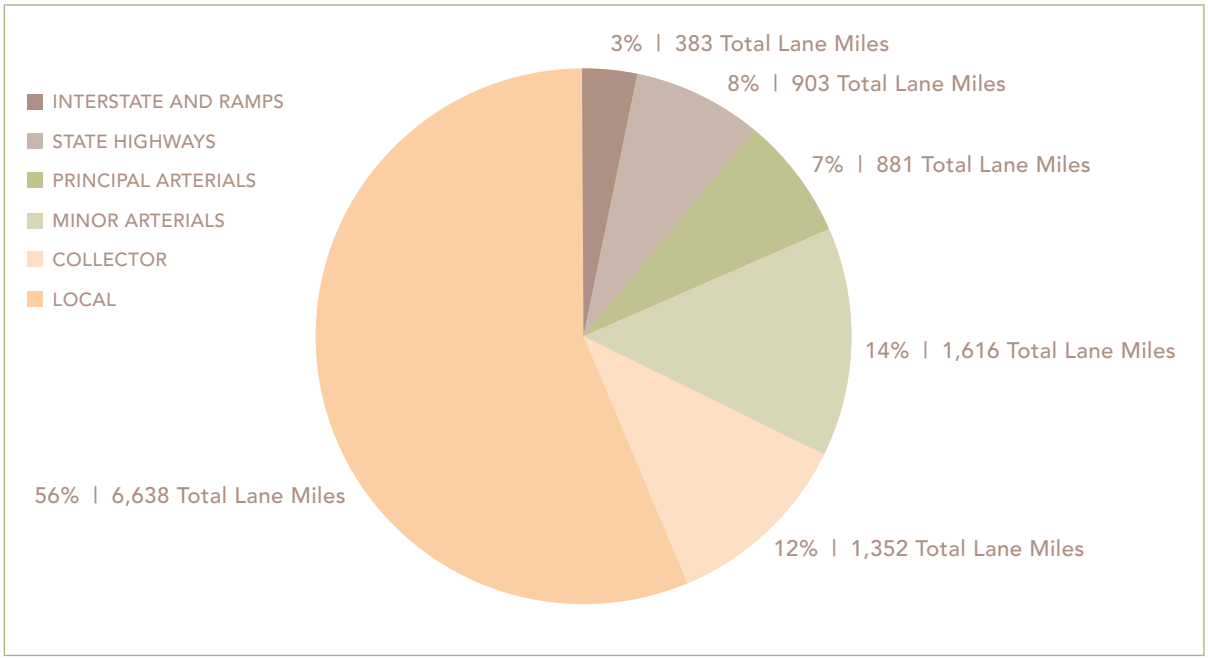

Figure 2. Total lane miles by classification, Ada and Canyon Counties

CONGESTION MANAGEMENT PROCESS

The transportation system needs that are funded or prioritized in this plan are based on the regional vision and goals, including safety, mobility of people and goods, and managing congestion. Data from the congestion management process (CMP), a systematic approach for analyzing, identifying, monitoring, and managing congestion, were used to identify congestion mitigation needs in the development of this plan and the Transportation Improvement Program (TIP).

Roadways serve multiple modes of travel, including autos, school buses, public buses, freight trucks, bicycling, and walking. In Ada and Canyon Counties, most traffic is comprised of private vehicles. According to the American Community Survey,[8] almost 90% of residents in the area travel to work by auto, and a majority of them (80%) do so by themselves (Table 1).

Table 1. Commute-to-work travel modes, Ada and Canyon Counties

	Ada County		Canyon County		Both Counties	
Drove alone	164,536	80.2%	65,668	78.0%	230,204	79.6%
Carpooled	16,659	8.1%	9,800	11.6%	26,459	9.1%
Public transportation (excluding taxicab)	1,001	0.5%	224	0.3%	1,225	0.4%
Bicycled	3,509	1.7%	388	0.5%	3,897	1.3%
Walked	3,629	1.8%	1,283	1.5%	4,912	1.7%
Worked at home	13,857	6.8%	5,464	6.5%	19,321	6.7%
Total	205,169		84,136		289,305	

Source: U.S. Census Bureau, 2012–2016 American Community Survey 5-year estimates

The 2018 transportation system is estimated to serve over 1.8 million vehicle trips on an average weekday and is forecasted to serve almost 3 million by 2040. To put this in a different perspective, in July 2018, over 150,000 vehicles traveled on Interstate 84 between the Eagle Road interchange and the Flying Wye on an average weekday—up by 10,000 from the 2017 annual weekday average (Figure 3). Table 2 illustrates the estimated travel times between common destinations on key corridors by 2040, based on projects funded in this plan.[9]

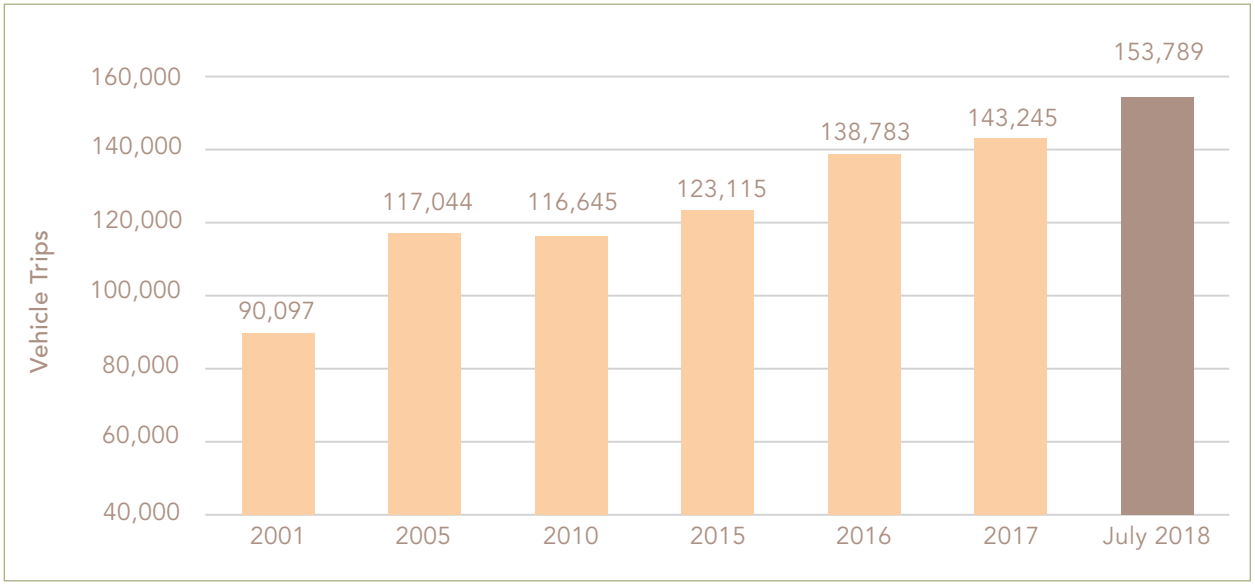

Figure 3. Weekday volumes on I-84 between Eagle Road and the Wye Interchange

Table 2. Estimated travel time during the peak hour between common destinations by 2040, based on projects funded in this plan

	2017/2018	2040, with CIM 2040 2.0 funded projects
City of Caldwell to downtown Boise	39 minutes	55 minutes
City of Nampa to Boise Airport	28 minutes	38 minutes
City of Star to St Luke's in downtown Boise	33 minutes	62 minutes
North Meridian to Veteran's Memorial Parkway	24 minutes	30 minutes
City of Eagle to St Luke's Meridian	20 minutes	30 minutes
City of Nampa to Gowen Interchange/Micron	32 minutes	42 minutes

The congestion management process (CMP) is a systematic approach for analyzing, identifying, monitoring, and managing congestion in the COMPASS planning area. A CMP is federally required for areas with populations exceeding 200,000, known as Transportation Management Areas. The Boise Urbanized Area reached this population threshold with the 2000 Census.

The *Treasure Valley Congestion Management System Plan*[10] was finalized in March 2005. It is used to identify congestion reduction needs by identifying the transportation network to include in the process; data collection procedures; how to measure congestion; reporting requirements; strategies for mitigating congestion; and how to tie in the results of the report to the long-range transportation plan and Regional Transportation Improvement Program (TIP).[11]

The process includes measures for monitoring congestion and identifies management strategies to mitigate or reduce the impact of congestion on the transportation system. The resulting transportation improvements and strategies are evaluated to determine their effectiveness in mitigating congestion.

Data Collection

COMPASS has collected and reported on travel time data since 2003.[12] Changes in technology have led to changes in data collection methods.

From 2003 to 2016, COMPASS used the "floating car" method—meaning a COMPASS staff member would drive a vehicle—to collect travel time data on Interstate 84, Interstate 184, and principal arterials throughout Ada and Canyon Counties at least four times per year in each direction during the morning (6:30 am to 8:00 am) and afternoon (4:00 pm to 6:00 pm) peak hours. The period with the highest average travel time was compared to the free flow, or ideal, travel period (2:00 am to 5:00 am). Between 2003 and 2009, a computer program and strict driving procedures ensured data reliability, reproducibility, and comparability. In 2010, COMPASS invested in GPS units, a GPS data logger, and software (TravTime 2.0) for data collection and analysis. Staff also combined roadway segments into full corridors for a more comprehensive set of travel time data, and drove two vehicles for collection. This process was used through 2016.

Also in 2016, COMPASS staff started using the National Performance Management Research Data Set (NPMRDS) to analyze, identify, and report congestion. The NPMRDS covers the National Highway System, and is procured by the Federal Highway Administration and made available to state and local governments to assist with performance measure research. The dataset is composed of travel time records averaged in five-minute intervals for segments of roads on the National Highway System; it is collected from millions of cars, trucks, and mobile devices that supply location and movement data. A summary of 2013–2017 congestion data can be found in Table 3; archived annual reports[13] are available on the COMPASS website.

Table 3. Miles and percentage of high, medium, and low congestion, Ada and Canyon Counties (2013–2017)

Year	High		Medium		Low		Total Miles
	Miles	Percent	Miles	Percent	Miles	Percent	
2013	50.45	20.20%	48.07	19.20%	151.78	60.60%	250.30
2014	84.30	30.30%	39.91	14.40%	153.43	55.30%	277.64
2015*	126.09	34.40%	55.13	15.00%	185.22	50.60%	366.44
2016*	136.05	37.10%	36.12	9.90%	194.27	53.00%	366.44
2017*	54.71	14.90%	99.33	27.00%	213.54	58.10%	367.58

*The change in mileage is due to more travel time data made available by the current vendor.

The NPMRDS covers fewer miles of road than the previous data collected by COMPASS, shown as "missing" in Figure 4, but it provides more data and is collected year-round, enabling a more analytical and affordable approach to identifying congestion trends and patterns. This dataset can also be used to distinguish freight travel times from passenger vehicle travel times.

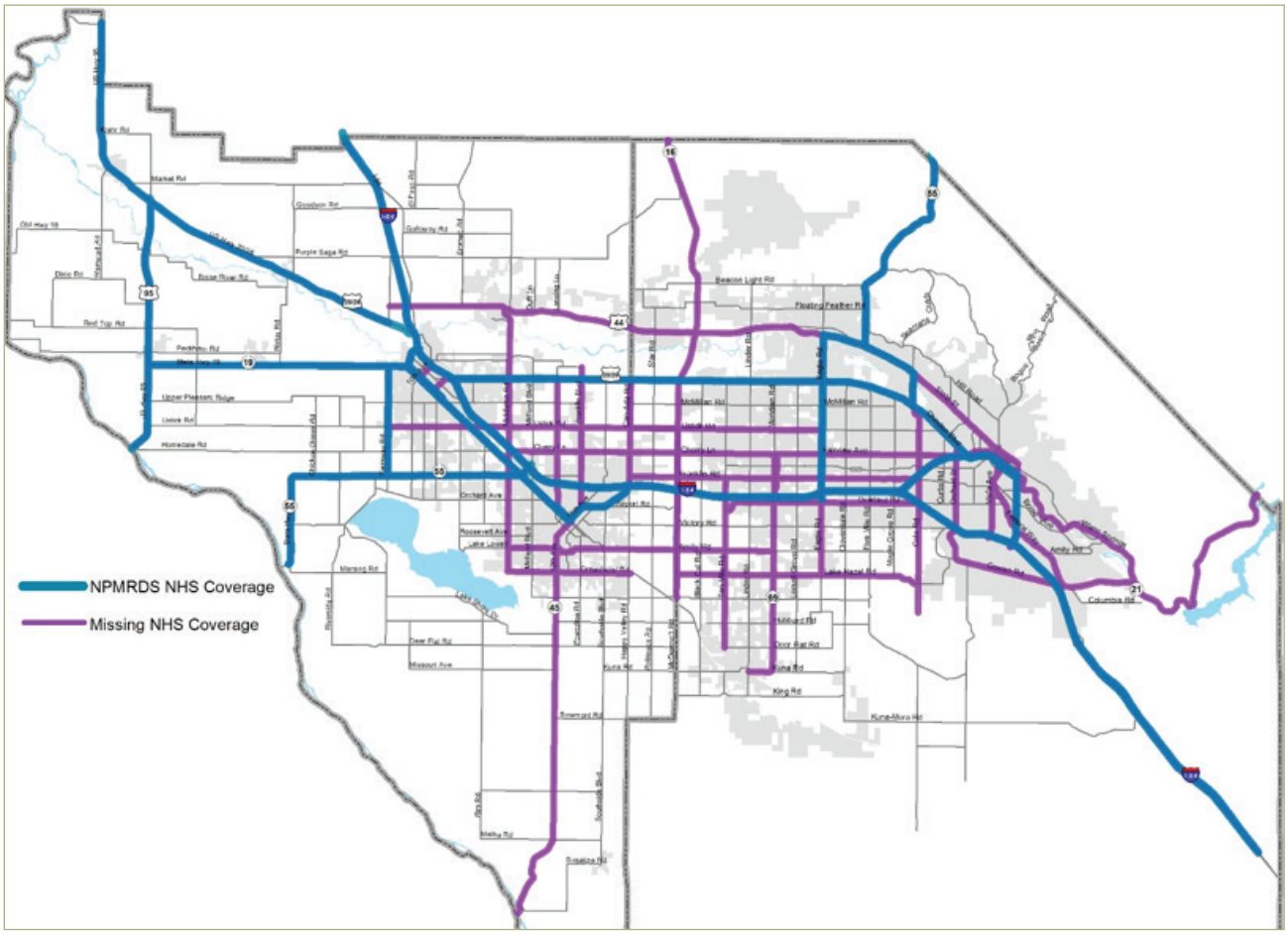

Figure 4. NPMRDS data coverage of National Highway System (NHS) roads

Complete Streets

The COMPASS Complete Streets policy[14] envisions a Treasure Valley where roadways are designed to be safe, efficient, and viable, and provide an appropriate balance for all users, including motorists, bicyclists, transit riders, and pedestrians of all ages and abilities. The COMPASS Complete Streets policy has been in place since 2009. Achieving Complete Streets was a consideration throughout the CIM 2040 2.0 transportation planning process. COMPASS will be updating its 2009 Complete Streets policy in 2019.

Identifying Needs

There is not sufficient funding to pay for all transportation needs identified to the year 2040. Unfunded needs were identified and prioritized for funding if and when additional funds become available.[15] COMPASS used its Travel Demand Forecast Model[16] to forecast impacts on the transportation system if each unfunded project

were to be funded—or not. The results compare the complete "funded" 2040 transportation system[17] in this plan against itself *plus* each unfunded project individually. This allowed the Regional Transportation Advisory Committee[18] and COMPASS Board of Directors[19] to see changes in the system if each unfunded project were to be funded. Outputs included differences in

- vehicle miles of travel;
- congested vehicle miles of travel; and
- vehicle hours of delay.

View complete results for all corridors and projects modeled, as used for prioritization.[20]

COMPASS staff later re-analyzed the unfunded prioritized projects using updated information and data. This updated analysis did not change the priority order of the projects, but was conducted to provide the most up-to-date analysis possible.[21]

Progress and Future Considerations

The Moving Ahead for Progress in the 21st Century Act (MAP-21), signed in 2012, includes provisions requiring state transportation agencies and metropolitan planning organizations such as COMPASS to report performance measures and set targets for safety, infrastructure, and system performance for their planning areas. The measures for system performance include the percent of interstate/non-interstate that is reliable, truck travel time reliability, peak hour excessive delay, and percentage of non-single occupancy vehicle travel. Each of these measures can be used as a gauge of how congestion is impacting the transportation system. Learn more about these performance measures and performance-based planning.[22]

Bi-annually, COMPASS publishes the *Change in Motion* report.[23] The report includes a set of measures and targets established by the COMPASS Board of Directors to track progress toward *Communities in Motion* goals and targets. The measures included in this report complement some of the strategies in the CMP. Measures relating to bicycle and pedestrian infrastructure, transit, and land use can all be used to gauge progress on the strategies presented in the CMP.

COMPASS' TIP is a five-year budget of federally funded and regionally significant transportation projects that help meet the goals of *Communities in Motion*. The TIP includes attributes on each project, including which performance measures will be impacted by the project. Beginning in 2019, the CMP report will list the planned and completed projects in the TIP that correspond to mitigating congestion, including congestion and travel time reliability as they relate to freight in the valley.

Strategies for Mitigating Congestion

Using the travel time data and analyses from the annual CMP report, local transportation agencies are able to identify areas of high congestion and determine the best strategies to mitigate it. The CMP annual report cites four categories of congestion management strategies identified in the Federal Highway Administration's *Congestion Management Process: A Guidebook*[24] to be used as guidance for developing projects to mitigate congestion.

Table 4. Federal Highway Administration congestion management strategies

Strategy	Description	Examples
Travel Demand Management	Providing travelers with more options for how and when they commute to reduce the number of trips during congested hours	• Pedestrian/bicycle infrastructure • Ride sharing • Flexible work arrangements • Transit-Oriented Development
Traffic Operations Improvements/Intelligent Transportation Systems (ITS)	Improvements focused on optimizing current transportation infrastructure	• Optimal signal timing • Intersection improvements • Transit signal priority
Public Transportation Improvements	Improving transit operations, access, and service to encourage more usage to reduce the number of vehicles on the road	• High-capacity transit • Expanded frequency/hours of service • Expanded transportation network
Road Capacity	Adding more base capacity by adding lanes, new roads, or improving intersections	• Adding travel lanes • Closing gaps in the street network • Overpass/underpass

Source: *Congestion Management Process: A Guidebook*

OPERATIONS, MANAGEMENT, AND INTELLIGENT TRANSPORTATION SYSTEMS

Transportation Systems Management and Operations Plan

Much like a long-range transportation plan, a transportation systems management and operations plan (TSMO) is a long-term plan that includes a vision and strategies (i.e., projects) for the management and operations of the transportation system.

While some of the strategies are tangible projects such as traffic signals, others focus on behind-the-scenes elements that make the transportation system work, such as technology, communications, and collaboration. TSMO strategies are integrated into the planning process to improve the transportation system's efficiency, reliability, and options.

The 2014 *Treasure Valley Transportation System: Operations, Management, and ITS [Intelligent Transportation Systems] Plan*[25] outlined cost-effective strategies to meet the mobility, safety, environmental, and economic development goals of the region. The timeframe for the plan is 10 years (2014 through 2024), reflecting the near-term focus of operations strategies as well as rapid advancement of transportation technologies. This plan is scheduled to be updated in 2019.

Intelligent Transportation Systems

Another part of management and operations is Intelligent Transportation Systems, or "ITS." The Treasure Valley transportation system is comprised of nearly 1,000 technological devices— individual pieces of the ITS system—whose purpose is to help the transportation system run more efficiently. These devices range

from traffic signals, school flashers, and pedestrian crossing signals to less obvious devices such as roadway weather sensors. The "ITS architecture" provides a framework for regional collaboration to guide the planning and deployment of ITS strategies to address transportation challenges.[26]

The regional ITS architecture was developed through a cooperative effort by the region's transportation agencies, covering all modes and all roads in the region. It represents a shared vision of how all agencies' systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system.

I-84 Detour Plan

Transportation system management and operations involve multimodal transportation and emergency management agencies. To assist in incident management and coordination, the *Treasure Valley Incident Management and Operations Manual and Detour Route Plan*,[27] also referred to as the "*I-84/I-184 Detour Plan*," was completed in 2017. Detour route maps from this plan are available online in both interactive and printable formats.[28] The 2017 plan is an update to the 2008 *Treasure Valley Incident Management Operations Manual*. Significant changes in the transportation system, congestion levels, and operational approaches such as new interchanges, expanded interchanges, road widening, a new river crossing, and system technology enhancements prompted the update.

SUMMARY

Roadways are the backbone of the transportation system in Ada and Canyon Counties. Buses, commuter vans, and freight vehicles rely on our roadways. In addition, bike lanes and sidewalks along roadways provide a significant portion of our local bicycle and pedestrian infrastructure. CIM 2040 2.0 focuses on integrating all transportation system components to better plan for a future transportation system that can meet demands of growth and changing travel patterns. We are using more and better tools to evaluate and manage congestion, make investments in smart technology, and provide safe and complete roads and streets for all users.

NOTES

1 *Public Transportation*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/PublicTransportation.pdf

2 *Freight*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/Freight.pdf

3 *Active Transportation*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/ActiveTransportation.pdf

4 "Highway Functional Classification Concepts, Criteria and Procedures," US Department of Transportation, https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm

5 2040 Functional Classification Map, COMPASS, http://www.compassidaho.org/documents/prodserv/CIM2040/FunClass_adacan2040_official.pdf

6 *Prioritization Process for Unfunded Transportation Needs*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/Prioritization.pdf

7 *Conformity Demonstration for Communities in Motion 2040 2.0*, COMPASS, http://www.compassidaho.org/documents/prodserv/airquality/CIM20402_0Conformity.pdf

8 American Fact Finder, US Census Bureau, https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

9 CIM 2040 2.0 Funded Projects, COMPASS, http://compassidaho.maps.arcgis.com/apps/webappviewer/index.html?id=372622a6b5ea4e20a3ceed92553ad24d

10 *Treasure Valley Congestion Management System Plan*, COMPASS, http://www.compassidaho.org/documents/prodserv/reports/TreasureValleyCMSFinal.pdf

11 "Transportation Improvement Program," COMPASS, http://www.compassidaho.org/prodserv/transimprovement.htm

12 "Congestion Management Process," COMPASS, http://www.compassidaho.org/prodserv/cms-intro.htm

13 "Congestion Management System Reports–Archive," COMPASS, http://www.compassidaho.org/prodserv/cms-archive.htm

14 Complete Streets policy, COMPASS, http://www.compassidaho.org/prodserv/CIM2040_2.0/bikeped.html#los

15 See note 6.

16 "Regional Travel Demand Modeling," COMPASS, http://www.compassidaho.org/prodserv/traveldemand.htm

17 "Funded Projects," CIM 2040 2.0, http://www.compassidaho.org/CIM2040-2.0/funded-projects

18 Regional Transportation Advisory Committee, http://www.compassidaho.org/people/rtac.htm

19 COMPASS Board of Directors, http://www.compassidaho.org/people/board.htm

20 *Preliminary Technical Analysis, CIM 2040 2.0 Unfunded*, COMPASS, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/Tech_Analysis.pdf

21 *Final Technical Analysis, CIM 2040 2.0 Unfunded*, COMPASS, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/Final_Tech_Analysis.pdf

22 *Performance-Based Planning*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/Performance.pdf

23 "*Change in Motion* Reports and Tools," COMPASS, http://www.compassidaho.org/prodserv/gtsm-perfmonitoring.htm

24 *Congestion Management Process: A Guidebook*, US Department of Transportation Federal Highway Administration, https://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/cmpguidebk.pdf

25 *Treasure Valley Transportation System: Operations, Management, and ITS*, COMPASS, http://www.compassidaho.org/documents/prodserv/airquality/TreasureValleyTSMO_Plan_March2014.pdf

26 Treasure Valley ITS Architecture, COMPASS, http://www.compassidaho.org/prodserv/trans-mgmt.htm#arch

27 *Treasure Valley Incident Management Operations Manual and Detour Route Plan – Update 2017*, prepared for COMPASS by McFarland Management, LLC, in association with IBI Group, http://www.compassidaho.org/documents/prodserv/reports/TVIMReport_Final12-29-17.pdf

28 "Treasure Valley Incident Management Operations Manual (I-84/I-184 Detour Plan) Update," COMPASS, http://www.compassidaho.org/prodserv/trans-mgmt.htm