Freight

While the role of transportation is to move both people *and* goods, in the past, transportation planning efforts in the Treasure Valley have primarily focused on the movement of people. *Communities in Motion 2040 2.0* (CIM 2040 2.0) takes a more holistic view and includes freight—the movement of goods—in planning for a complete transportation system that also includes bicycle/pedestrian, public transportation, and roadway networks.

The purpose of COMPASS freight planning is to enhance freight movement within the region's transportation system to better serve urban deliveries, rural economies, and global connections.

Freight data collection and analysis, coupled with a better understanding of the impact of freight in the region, provide the foundation for integrating freight into long-range planning. In 2008, COMPASS and the Idaho Transportation Department (ITD) coordinated the first truck freight data collection project for the Treasure Valley. The project included three related data collection efforts: a commercial vehicle intercept survey, an external station license survey, and a commercial vehicle origin-destination survey. More information on the 2008 study can be found on the COMPASS website.[1]

As the next step to learning more about freight in the region, COMPASS conducted an agricultural freight study in 2014/2015. Grant funding in 2015 then provided an opportunity to collect data about the number and type of freight trucks, and those data were subsequently used in a 2017 COMPASS freight study. These three studies, and identification of critical urban freight corridors, are described in more detail below.

To advise COMPASS staff on data collection and analysis, and how to best integrate freight considerations into CIM 2040 2.0, COMPASS established a Freight Advisory Workgroup[2] in 2015. The workgroup has helped COMPASS identify regional freight needs and deficiencies, identify appropriate freight performance measures, and stay informed of the issues facing the freight community.

AGRICULTURAL FREIGHT STUDY

Agriculture is one of the primary economic drivers in the region, particularly in Canyon County, yet historically, very little has been known about the transportation routes and needs associated with farm freight. In fall 2014, COMPASS began work on an agricultural freight study[3] to identify important routes used for hauling farm produce from fields to processors, and from processors to markets. Identifying those key routes was a first step in ensuring they are preserved and well-maintained so they can continue to serve the agricultural community. The study was completed in fall 2015.

During discussions about preferred agricultural freight routes, truck drivers raised concerns about driving oversized vehicles such as freight trucks, farm equipment, buses, and emergency vehicles through roundabouts. In response to these concerns, COMPASS developed a brochure for drivers of large vehicles to explain how they can safely and properly navigate roundabouts[4] (Figure 1), resulting in an additional unanticipated benefit of the study.

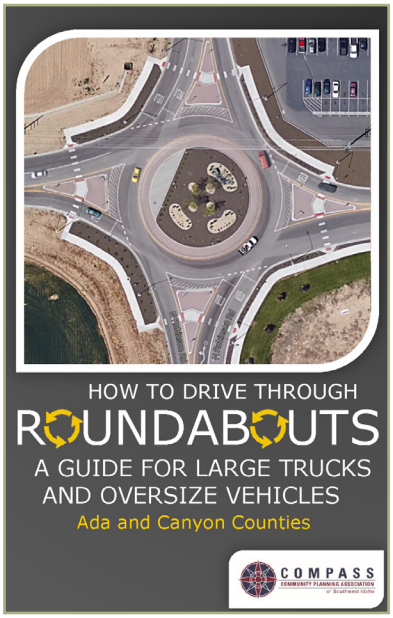

Figure 1. Roundabout brochure

SHRP2 DATA COLLECTION

In March 2015, COMPASS received a $225,000 implementation assistance grant under the Second Strategic Highway Research Program (SHRP2) as a "Lead Adopter" in two areas: freight considerations[5] and performance measures.

COMPASS used SHRP2 grant funds to collect vehicle classification counts at over 80 locations on key corridors (Figure 2). This data collection method counts the passing vehicles and segregates them into classifications based on the number of axles in order to identify the number, size, and types of freight vehicles at specific locations. This data collection effort was completed in November 2015 and fed into the freight component of CIM 2040 2.0.

These counts were augmented in select locations in 2017 to provide additional data for the 2017 COMPASS freight study.

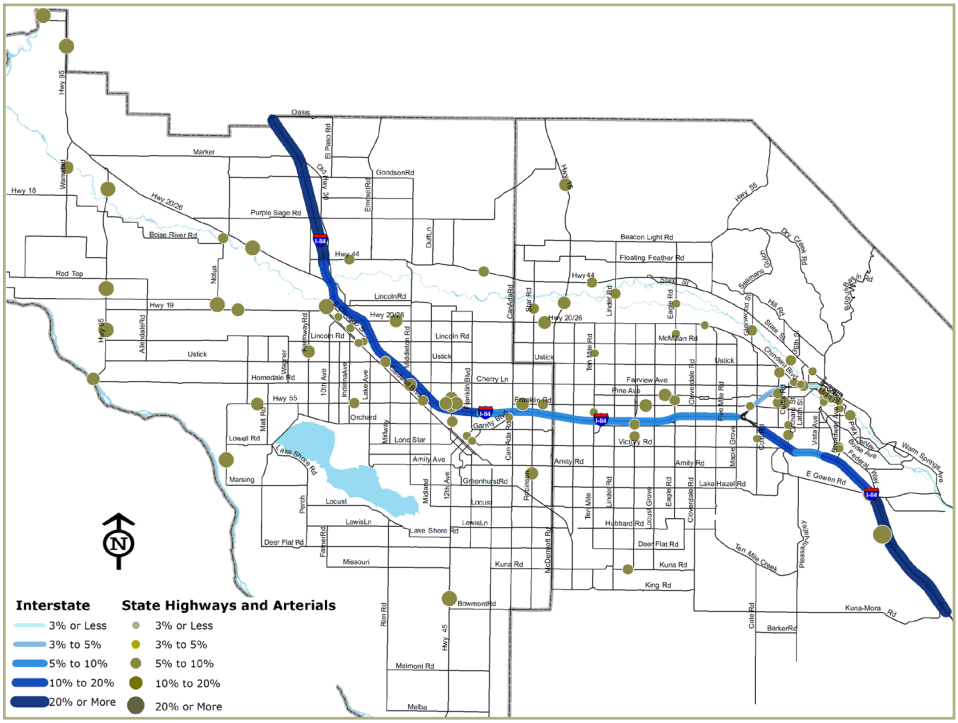

Figure 2. Vehicle classification counts showing percent freight trucks of the total number of vehicles

2017 COMPASS FREIGHT STUDY

The 2017 COMPASS freight study built upon the SHRP2 data and agricultural freight study (see above), with input from the Freight Advisory Workgroup.

COMPASS contracted with CPCS in January 2017 to conduct this study with three main components: freight and land use, freight and the economy, and freight safety and reliability. The study was completed in April 2018 and the work is documented in nine working papers, two addendums, and a final report.[6]

The study identified the regionally most important freight commodities and supply chains, freight clusters and transfer centers, industrial land use and freight rail, current freight corridors, and freight needs. Key findings are described below.

Freight Commodities and Supply Chains

The total value of commodity flows into, out of, and within the region was **$27.3 billion** in 2016. Agri-food products, primary materials, manufactured products such as electronic components, and consumer products—a category that includes items shipped to and from local warehouses and distribution centers—each represent about one-quarter of all freight shipped in the region, by value (Figure 3). By tonnage, agri-food products and primary materials represent 85% of freight (Table 1). These patterns reflect the lower "value density" (i.e., value per ton) of products such as field crops and gravel.[7] Freight commodities and supply chains are discussed in more detail in *Working Paper 2-A: Freight Commodities and Supply Chains*.[8]

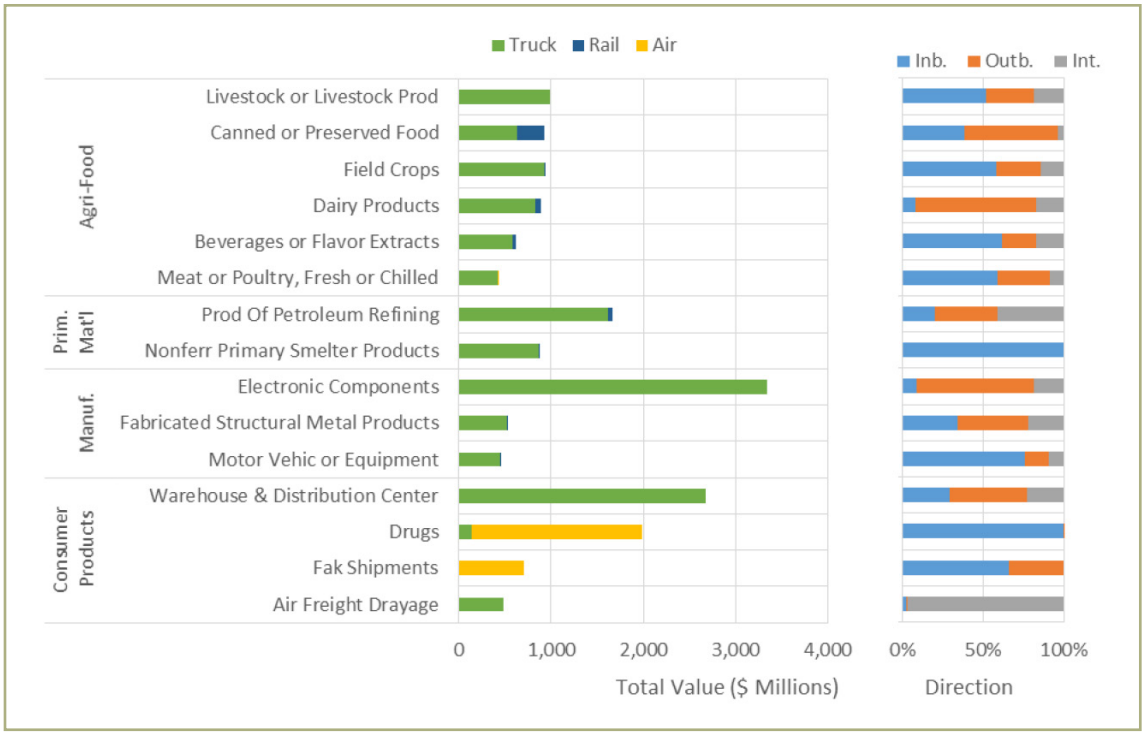

Figure 3.Top regional commodities by value. *Source*: CPCS analysis of Transearch via TREDIS (2016)

Table 1. Regional commodity groups by value and tonnage. *Source*: CPCS analysis of Transearch via TREDIS (2016)

Commodity Group	Value of Flows ($M)	% by Value	% by Tonnage
Agri-food products	$6,777	25%	42%
Primary materials	$5,439	21%	43%
Manufactures	$7,531	28%	5%
Consumer products	$7,562	27%	11%

Freight Clusters and Transfer Centers

The study defined four primary and eight secondary freight clusters for the region, measured in terms of truck destinations and freight employment (Figure 4). The key freight transfer centers discussed below overlap with the primary freight clusters.

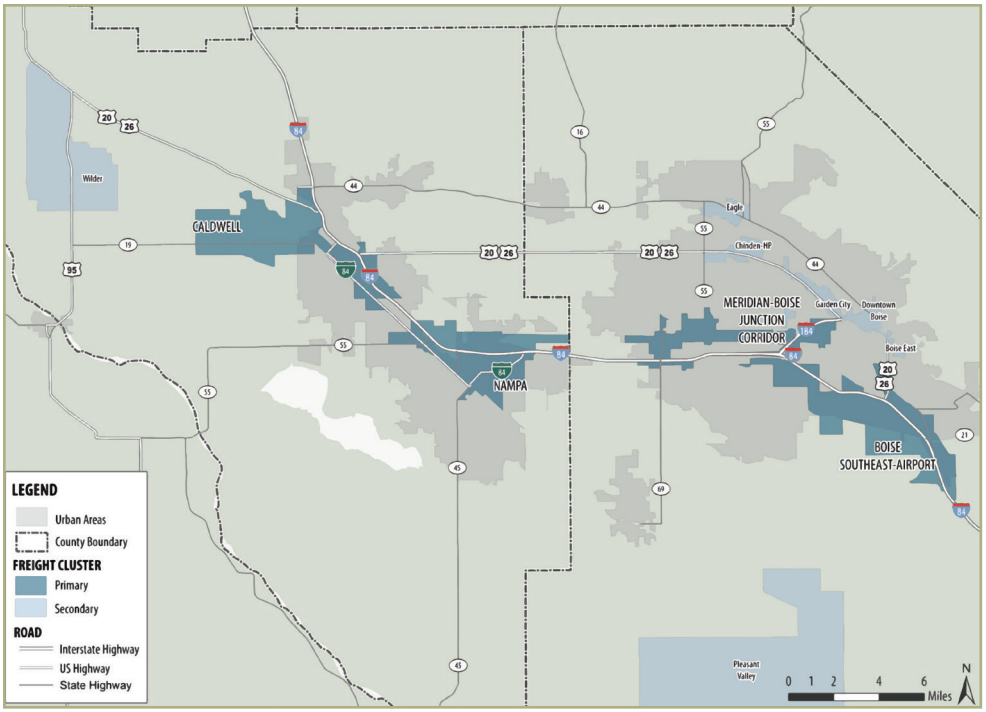

Figure 4. Location of freight clusters

The study examined the location of freight transfer centers in the region. A transfer center refers to a location where freight is transferred from one mode of transport to another. These were classified into three categories:

- Rail-to-truck: There is no central facility in the region for rail-to-truck transfers, but transfers, along with other activities such as storage, take place along rail spurs, corresponding to the locations of freight-dependent shippers.
- Air-to-truck: The Boise Airport serves as the transfer center for air-to-truck movements. In general, cargo shipped by air is delivered by truck to its final destination. According to the Federal Aviation Administration, in 2016, the Boise Air Terminal/Gowen Field handled nearly 346 million pounds of cargo by landed weight, ranking 67th among all airports nationally.[9]
- Pipeline-to-truck: Refined oil is delivered via pipeline to fuel terminals at Franklin Road and Curtis Road. In addition, the region receives petroleum products via rail, including ethanol that is blended at the Boise fuel terminals.

Freight transfer centers and clusters are discussed further in *Working Paper 1-A: Regional Freight Clusters*.[10]

Industrial Land Use and Freight Rail

Union Pacific Railroad (UP) and Boise Valley Railroad (BVRR) provide freight rail service in Ada and Canyon Counties. UP operates the largest rail network in the United States and provides long-haul freight connectivity throughout the country. UP owns 95.1 track miles in Ada County and 139.2 track miles in Canyon County, representing nearly 28% of total UP track miles in Idaho. Figure 5 shows the current system of rail lines and spurs in Ada and Canyon Counties.

BVRR, a short-line railroad owned by WATCO, operates over UP trackage on 63 track miles in the region, including the Boise Cutoff (26 track miles) and the Wilder Branch (11 track miles). UP and BVRR serve local shippers and receivers, connecting the region with customers and suppliers across North America and globally through major maritime ports. Freight rail and related commodity and land use issues are discussed in more detail in *Working Paper 1-B: Inventory of Industrial Uses and Future Zoning on UPRR Spurs*.[11]

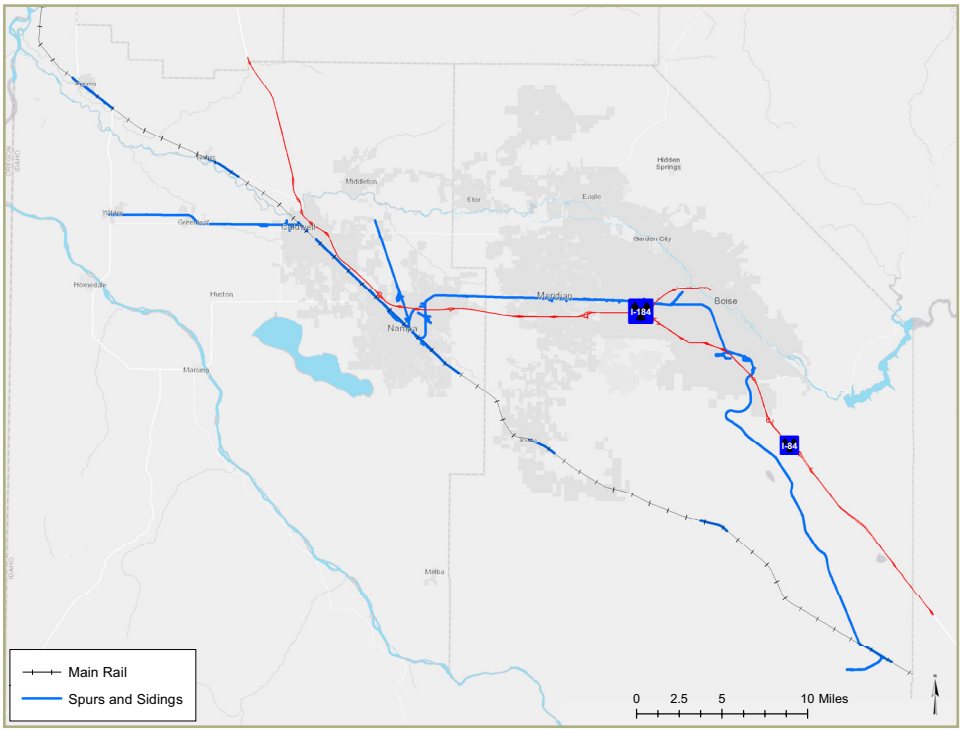

Figure 5. Rail lines and spurs

Industrial land in Ada and Canyon Counties is mainly concentrated in the Cities of Boise and Nampa, on county land along the western end of the Boise Cutoff, and along the two industrial leads, the Wilder Branch and the Amalgamated Sugar Industrial Lead in Canyon County. A majority of the existing industrial land is supported by current planning and zoning. Some existing industrial land is slated to be converted to other uses; however, even more non-industrial land exists that could be converted to industrial use. This would allow for growth of industrial land within the region into the future and should keep it designated as such even with development pressures.

Current Freight Corridors

The study identified a truck corridor network for Ada and Canyon Counties, described which corridors are most important for the movement of trucks, and documented the present-day reality of how these corridors are used. The identification of a truck corridor network was NOT intended as a planning exercise (i.e., "where trucks *should be*"); instead, the study used a combination of truck GPS data and truck classification counts to identify where trucks *are today* (Figure 6). The innovative approach used in the study to determine truck volumes provided an estimate of truck volumes region-wide. Four categories describe a "hierarchy" of truck corridors. These range from the interstate and some state highways (regional corridors), which comprise the "trunk" of the freight network, to corridors that connect freight activity centers to the interstate (regional connectors), additional routes that provide local connectivity (supplemental connectors), and other more rural routes (other connectors). The methodology and the truck corridor network are discussed in more detail in *Working Paper 2-B: Regional Freight Corridors*.[12]

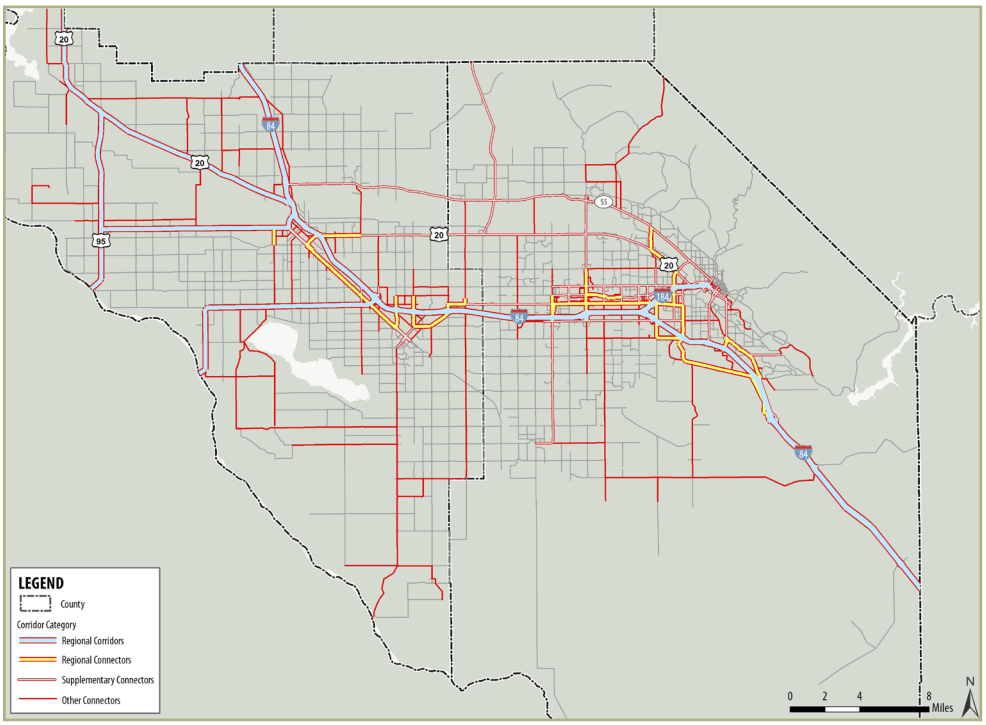

Figure 6. Truck corridor network

Freight Needs

Regional freight needs were identified based on analysis of the current truck corridor network as well as performance issues found through analysis of delay and safety data and consultations with dozens of industry practitioners. Safety data analysis looked at truck-involved crashes normalized by truck volume, and reviewed the most common contributing factors among truck-involved crashes: intersection/turning, lane change, and aggressive driving. The safety analysis is explained in *Working Paper 3-A: Freight Safety*.[13] Figure 7 illustrates delay and safety "hotspots," which are discussed further in *Working Paper 4-A: Freight Strategies and Costs*.[14]

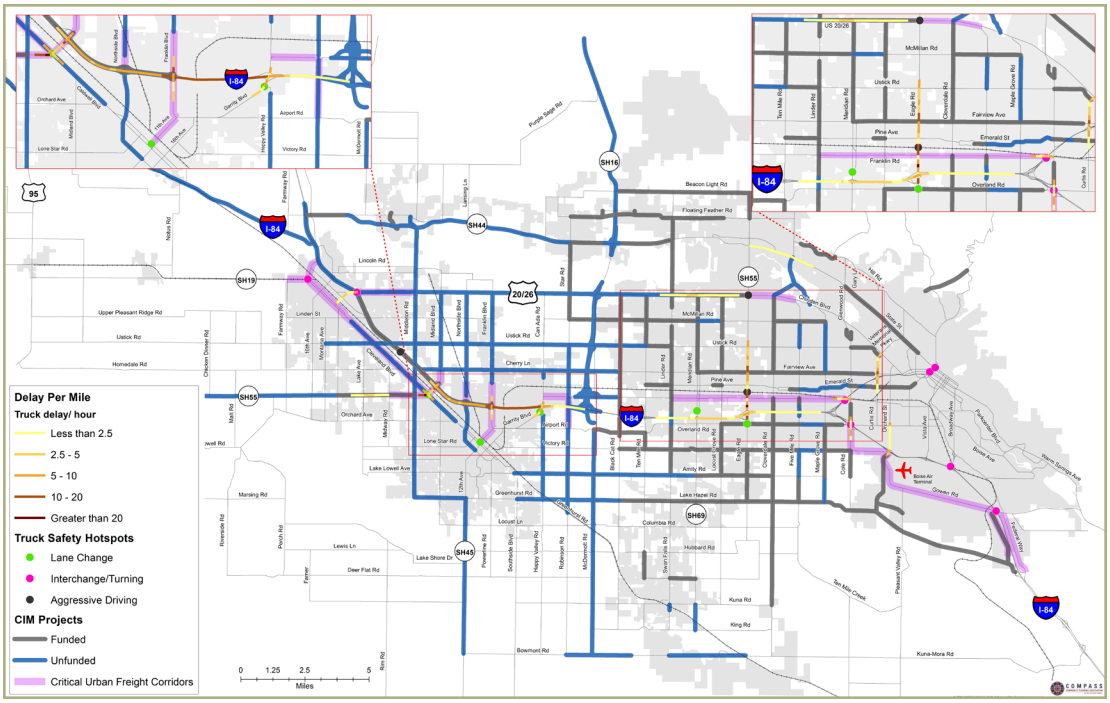

Figure 7. Freight delay and safety hotspots

Detailed analysis of the top freight needs and issues showed that most, if not all, of freight needs go beyond freight-specific issues to include passenger vehicle issues and other impacts (e.g., non-motorized users, urban planning impacts, etc.). For example, congestion on I-84 in Meridian and Boise impacts, and is caused by, passenger vehicles more than freight vehicles, even though this area of I-84 is one of the top freight bottlenecks. Solutions to this bottleneck could involve a range of solutions, such as

- mainline capacity expansion;
- expansion and upgrading of parallel routes (such as US 20/26);
- road pricing to shift more passenger traffic to off-peak times;
- investment in other modes of transportation that would shift commuters from automobiles; and
- other regional policies aimed at encouraging different regional employment patterns, telecommuting, and ride sharing.

Exploring such alternatives means looking at an integrated transportation system for solutions.

CRITICAL URBAN FREIGHT CORRIDORS

The 2015 Fixing America's Surface Transportation Act (FAST Act) established criteria[15] for designating critical urban freight corridors eligible for federal freight funding. The corridors must:

- be in an urbanized area;
- connect an intermodal facility to the primary highway freight system, the interstate system, and intermodal freight facility;
- be located within a corridor of a route on the primary highway freight system and provide an alternative highway option important to goods movement;
- serve a major freight generator, logistic center, or manufacturing and warehouse industrial land;

or

- be important to the movement of freight within the region, as determined by the state.

COMPASS worked with the Freight Advisory Workgroup to identify potential critical urban freight corridors in Ada and Canyon Counties to be included in ITD's *2017 Statewide Freight Strategic Plan*.[16] After additional input from other stakeholders, 16 corridors/segments in Ada and Canyon Counties were designated as critical urban freight corridors in the plan (Figure 8). These designations have allowed several projects in Canyon County to be prioritized for statewide federal freight funding over the next four years.

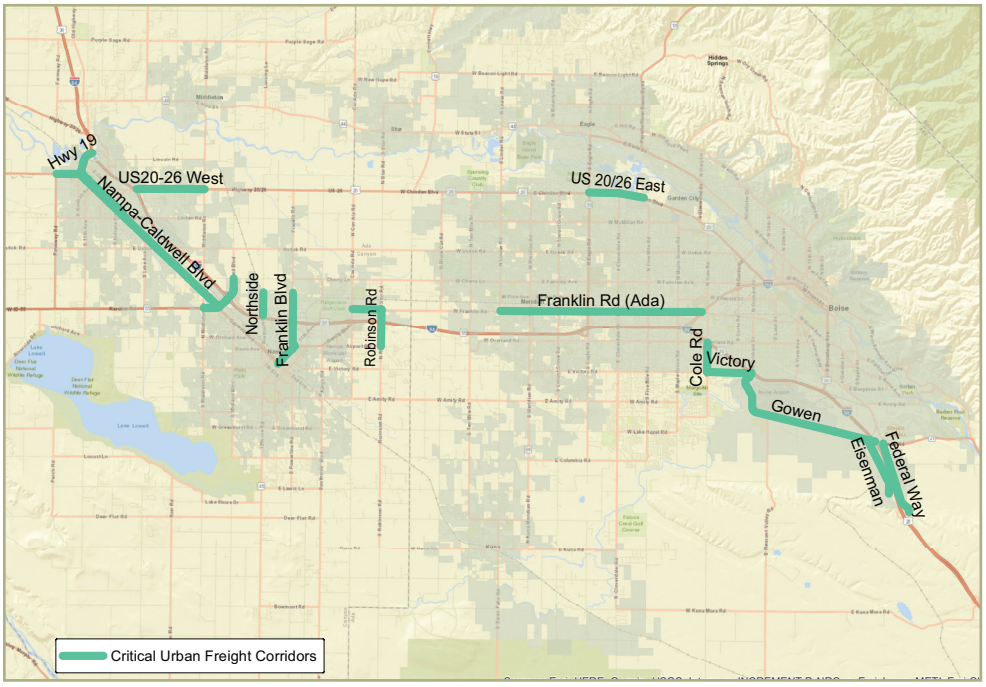

Figure 8. Critical urban freight corridors included in ITD's *2017 Statewide Freight Strategic Plan*

The critical urban freight corridor designations are reviewed as needed with ITD to determine whether or how the designations should change to make new segments available for freight funding.

INTEGRATING FREIGHT WITH OTHER COMPONENTS

As discussed above, freight needs go beyond narrow freight-specific issues and include other modes, planning issues, and policies. The prioritization of transportation needs for CIM 2040 2.0[17] integrated freight into a multi-criteria project evaluation matrix by indicating whether a needed project was located on the current truck corridor network. The matrix included similar information about public transportation corridors and bicycle and pedestrian infrastructure.

Opportunities for mode shift, such as truck to rail, can affect other transportation components or modes. For example, more freight rail customers may make rails-with-trails pathway development more challenging, while decreasing truck traffic on some roadways could make those routes safer and more convenient for pedestrians and bicyclists, especially along protected bike lanes (Figure 9). From a land-use perspective, considerations such as designing a site so that development is buffered from truck freight corridors and rail lines can impact how well freight integrates with other land uses (Figure 10).

Figure 9. Protected bike lane

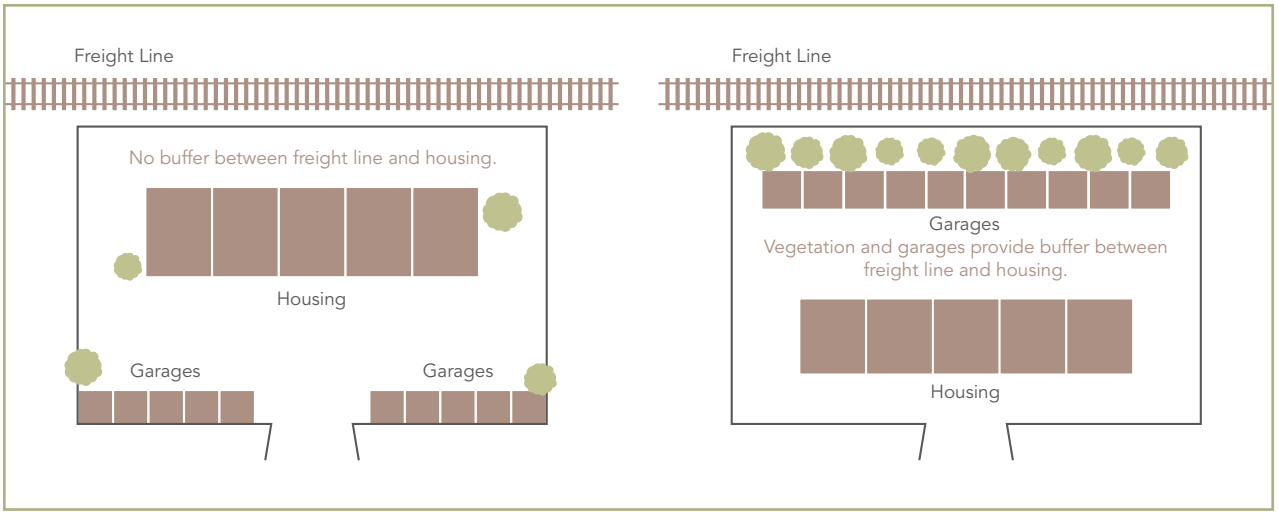

Figure 10. Example of site design to buffer development from freight corridor. *Source*: COMPASS freight study presentation, 2017.

CONCLUSION

The findings from these freight studies inform COMPASS's long-range transportation planning. COMPASS will continue to use the Freight Advisory Workgroup to convene public- and private-sector stakeholders to discuss and develop solutions to regional freight issues, and to further refine its project list in consultation with regional stakeholders. For example, one follow-up item to consider is how the current truck corridors match with local jurisdictions' land use plans and preferences.

In the long-range transportation plan, freight needs and deficiencies are converted into improvement projects that can be evaluated, prioritized, funded, and implemented as part of the overall transportation system. The identified solutions will also inform land use and development decisions adjacent to freight corridors and industrial areas.

On the horizon are also changes and innovations to transportation, manufacturing, materials, and communication technologies that already affecting how we produce, deliver, and receive goods. These innovations and changes, including some examples specific to freight, are discussed in *Emerging Technologies*.[18]

NOTES

1 "Treasure Valley Truck Freight Study," COMPASS, http://www.compassidaho.org/prodserv/specialprojects-tvtfs.htm

2 Freight Advisory Workgroup, COMPASS, http://www.compassidaho.org/people/workgroups.htm#fawg

3 "2015 Agricultural Freight Study," COMPASS, http://www.compassidaho.org/prodserv/CIM2040_2.0/freight.html#Ag

4 *How to drive through roundabouts: A guide for large trucks and oversize vehicles*, COMPASS, http://www.compassidaho.org/documents/prodserv/CIM2040/RoundaboutBrochure.pdf

5 "SHRP2 Implementation Assistance Grant," COMPASS, http://www.compassidaho.org/prodserv/SHRP2.html

6 *COMPASS Freight Study*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/COMPASS%20Freight%20Study%20Final%20Report_June%202018.pdf

7 Tonnage is more appropriate for understanding the needs and impacts of freight vehicles on roadways, while value is more relevant for understanding how freight facilitates regional economic prosperity.

8 *Working Paper 2A: Freight Commodities and Supply Chains*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightStudy2017_Commodities.pdf

9 *CY 2016 Final All-Cargo Landed Weights, Rank Order*, Federal Aviation Administration, https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy16-cargo-airports.pdf

10 *Working Paper 1-A: Regional Freight Clusters*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightStudy2017_Clusters.pdf

11 *Working Paper 1-B: Inventory of Industrial Uses and Future Zoning on UPRR Spurs*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightStudy2017_LandUse.pdf

12 *Working Paper 2-B: Regional Freight Corridors*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightStudy_RegionalFreightCorridors.pdf

13 *Working Paper 3-A: Freight Safety in the COMPASS Region*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/FreightWorkingPaper3ASafety.pdf

14 *Working Paper 4-A: Freight Strategies and Costs*, prepared for COMPASS by CPCS Transcom Inc., http://www.compassidaho.org/documents/prodserv/CIM2040_20/Working_Paper_4A_Freight_Needs.pdf

15 "National Highway Freight Program (NHFP), FAST Act Section 1116 Implementation Guidance," US Department of Transportation Federal Highway Administration, https://ops.fhwa.dot.gov/freight/pol_plng_finance/policy/fastact/s1116nhfpguidance/index.htm

16 *Idaho Transportation Department Statewide Freight Strategic Plan*, prepared for Idaho Transportation Department by Cambridge Systematics, Inc., with DKS Associates, https://apps.itd.idaho.gov/apps/freight/FreightPlan.pdf

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

18 *Emerging Technologies*, CIM 2040 2.0, http://www.compassidaho.org/documents/prodserv/CIM2040_20/TechDocs/EmergingTechnology.pdf