



COLORADO
Department of Transportation



EXECUTIVE SUMMARY

Colorado Freight Plan

2024





Planning for the Future and Delivering for Colorado

The 2024 Colorado Freight Plan (CFP) builds on the 2019 Statewide Freight Plan, incorporating new federally mandated requirements and Colorado state priorities. The updated CFP guides improvements and investments on the freight systems and supports Colorado’s vision of a safe, efficient, coordinated, and reliable system for the movement of goods. The Colorado Department of Transportation (CDOT) is committed to working with partners in the private sector, as well as public agencies, and regional and local planning partners to advance investments, actions, and policies that will achieve this vision. Recognizing current funding constraints and future growth needs, this plan supports the Statewide Transportation Plan and serves as a guiding document for ongoing and coordinated planning efforts at CDOT addressing issues such as aviation, passenger rail, transportation system management and operations, transportation safety, and other freight specific studies and analyses. Ongoing freight planning and implementation efforts will be supported by the Colorado Freight Advisory Council (FAC) and public agency and private industry partners. The CFP positions Colorado to better understand and improve the complex freight systems that Colorado businesses and consumers rely upon.

Colorado’s Freight Plan Vision

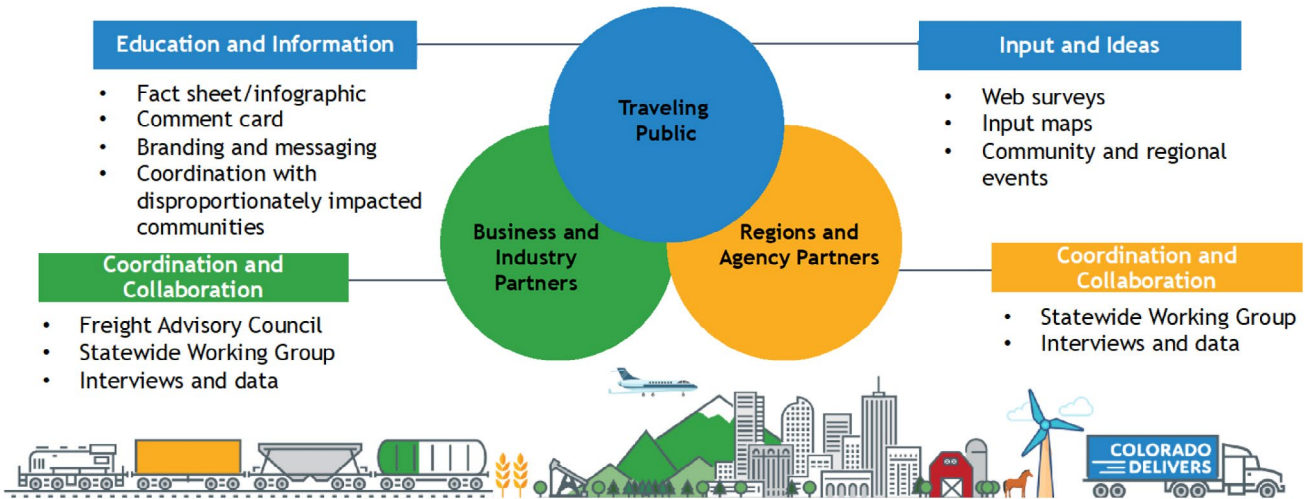
Colorado’s multimodal freight system will support the economic vitality of the state by providing for the safe, efficient, coordinated, and reliable movement of freight.



Engaging Stakeholders

CDOT is committed to fostering a collaborative freight planning process through partnerships with businesses, agencies and guidance from the FAC. The 2024 CFP collected conversations, concepts and feedback from freight planning partners ranging from the traveling public, advisory committees and industry personnel.

Figure 1. Engagement and Outreach Approach



The general themes of survey comments reflect commonly repeated responses and reinforce CDOT’s Wildly Important Goals.

- 1. Advancing Transportation Safety:** Safety was a top concern for survey respondents. Participants want a Colorado transportation system that allows all travelers to arrive at their destinations safely.
- 2. Accountability and Transparency:** Many respondents greatly value freight priorities that ensure an efficient use of taxpayer funds that focus on construction project delivery.
- 3. Clean Transportation:** Survey participants clearly desired freight policies that work to reduce pollution.
- 4. Efficiency of Statewide Transit:** Traffic congestion connected to statewide transit systems and rail services was a significant theme among survey respondents.

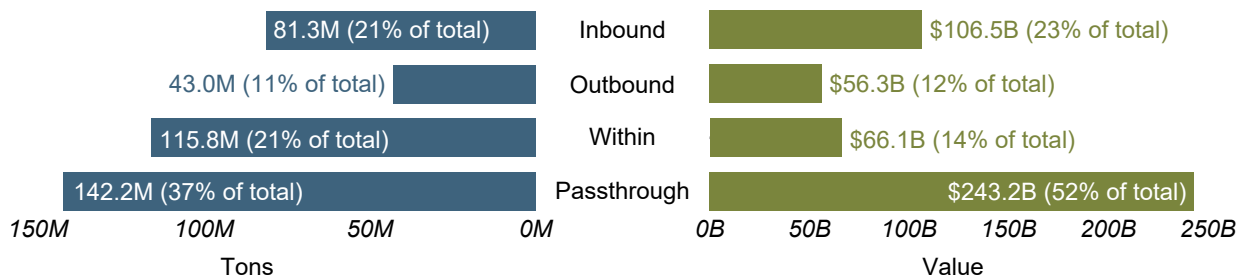
Concerns from the Freight Plan Working Group (FPWG) reinforced the vision, goals and strategies of the 2024 CFP. The ongoing dialogue suggested areas for investment and criteria to prioritize and assess freight program funding. Most participants answered that the availability of freight and access to multi-modal freight infrastructure were top priorities. Workforce readiness and financial constraints were also of concern. The greatest factor survey respondents identified as preventing businesses from improving operational efficiencies was congestion. On the other hand, many are optimistic about adopting new technology within the next 5-10 years.

- 1. Economic Partnerships:** A common theme for industry and business partners was to improve internal and external networks for growth.
- 2. Capacity & Bottlenecks:** Responses focused on barriers to growth included capacity limits and the presence of bottlenecks.
- 3. Modal Diversity:** Participants saw the state prioritizing highway freight often at the expense of other forms.
- 4. Safety and Environmental Concerns:** Often addressed simultaneously, participants often connected safety and innovation to environmental priorities.

Connecting the Economy

Colorado's freight network plays a pivotal role in the state's dynamic economy, serving as a critical backbone for the transportation of goods and commodities. Freight movements on Colorado infrastructure are substantial, with 382 million tons of freight worth nearly \$472 billion moved in 2021. About sixty-two percent of cargo originate, terminate, or move within Colorado, while the remaining thirty-seven percent of freight tonnage are passthrough and use the Colorado freight system to move to and from external origins and destinations (Figure 2). Inbound flows are nearly double that of outbound flows by tonnage and value, and thirty percent of freight by tonnage stays within the state, being both generated and consumed within Colorado. Freight movement in Colorado is expected to grow substantially by 2040 with the freight network projected to move an additional sixty-six million tons by 2040. The value of freight moved is expected to increase by over fifty percent during the same time period, for an increase of \$240 billion.

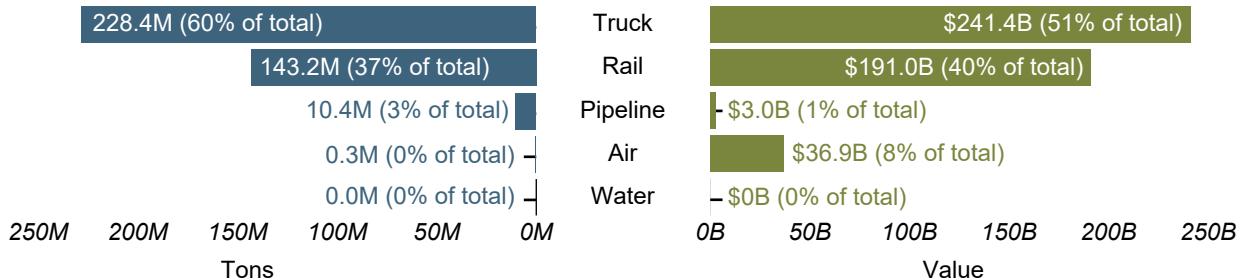
Figure 2. Freight Flows by Direction



Source: S&P TRANSEARCH with Confidential Waybill

In 2021, truck and rail flows constituted the majority of freight movements in the state (Figure 3). Truck traffic accounts for the majority of Colorado's freight traffic by tonnage and accounts for just over half of the total freight value moving in the state. Almost all types of commodities are moved by truck in or through Colorado. Rail flows comprise a variety of commodity moves (thirty-seven percent of total tonnage and forty percent of total value) and include significant coal shipments that are passing through Colorado from Wyoming to Texas, as well as terminating in Colorado. Air freight, which generally includes priority and time-sensitive items and high-value goods, accounts for 8 percent of freight moved by value (about \$37 billion) despite accounting for less than 0.1 percent of freight tonnage.

Figure 3. Freight Flows by Mode (Includes Pass-through)



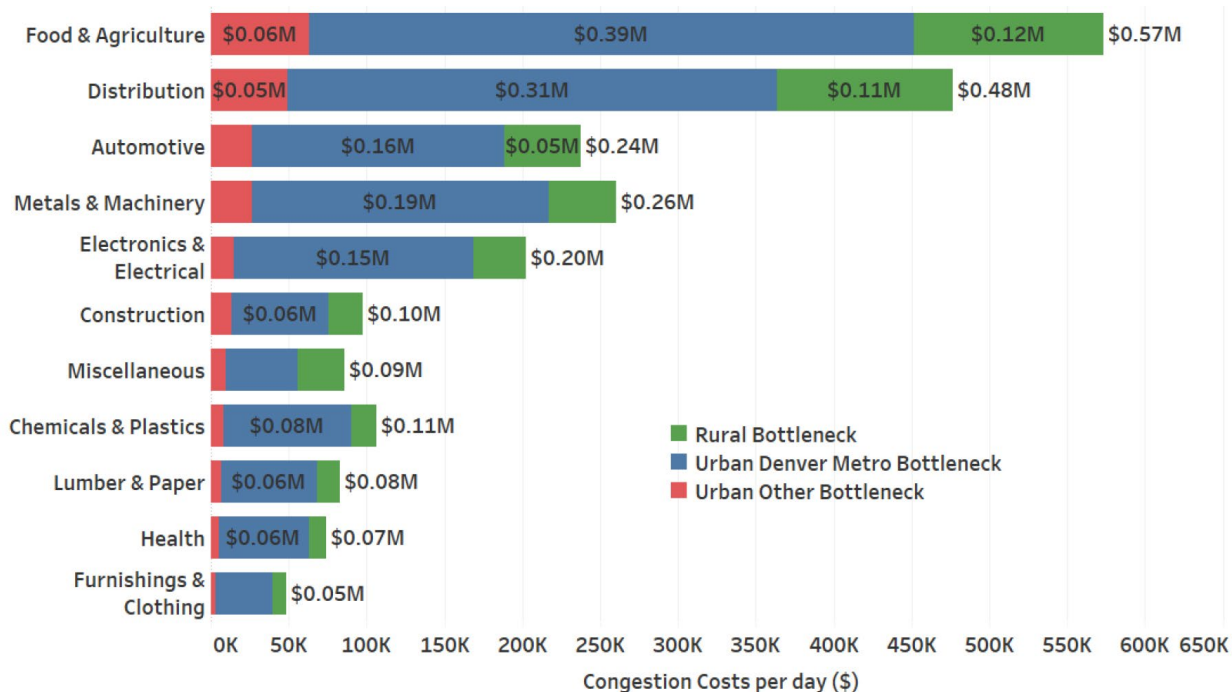
Source: S&P TRANSEARCH with Confidential Waybill

Congested Bottlenecks

Bottlenecks are a form of traffic congestion where vehicular flow is constricted within a localized area. Bottlenecks hinder the safe and efficient operation of vehicle and truck traffic. The thresholds used to identify bottlenecks were set at the top five percent of user costs per mile in each bottleneck type (Urban Denver Metro, Urban Other, and Rural). Different thresholds for the user cost metric were used to identify bottlenecks in rural areas versus urban areas. User costs refer to both expected costs of delay during periods of congestion that individuals and businesses account for in their travel planning as well as costs of unreliability (i.e., unexpected increases in travel time due to unforeseen events). There were 50 centerline miles of roadway in Urban Denver Metro with user costs higher than the threshold. In Urban Other, a total of 21 centerline miles of roadway were above the threshold, in Rural, 99 miles of 91 were above the threshold. In total, urban areas encompassed roughly forty-two percent of the bottleneck mileage compared to fifty-eight percent in rural areas.

On a typical weekday, congestion is estimated to cause \$20.7 million in costs to trucking companies and shippers (throughout the NHS in Colorado). Of this figure, delays valued at approximately \$3.7 million occur at specific bottlenecks identified in this analysis. These daily congestion costs were further broken out by supply chain by using commodity flow data from TRANSEARCH. The food and agriculture industry is most impacted by bottleneck hotspots, with congestion costs surpassing \$570,000 per day, followed by distribution, automotive, metals and machinery, and electronics and electrical goods (Figure 4). Bottlenecks in the Denver Metro region account for over two-thirds of statewide bottleneck costs accrued by each of the supply chains analyzed.

Figure 4. Bottleneck Congestion Costs per day (\$) by Supply Chain Groups



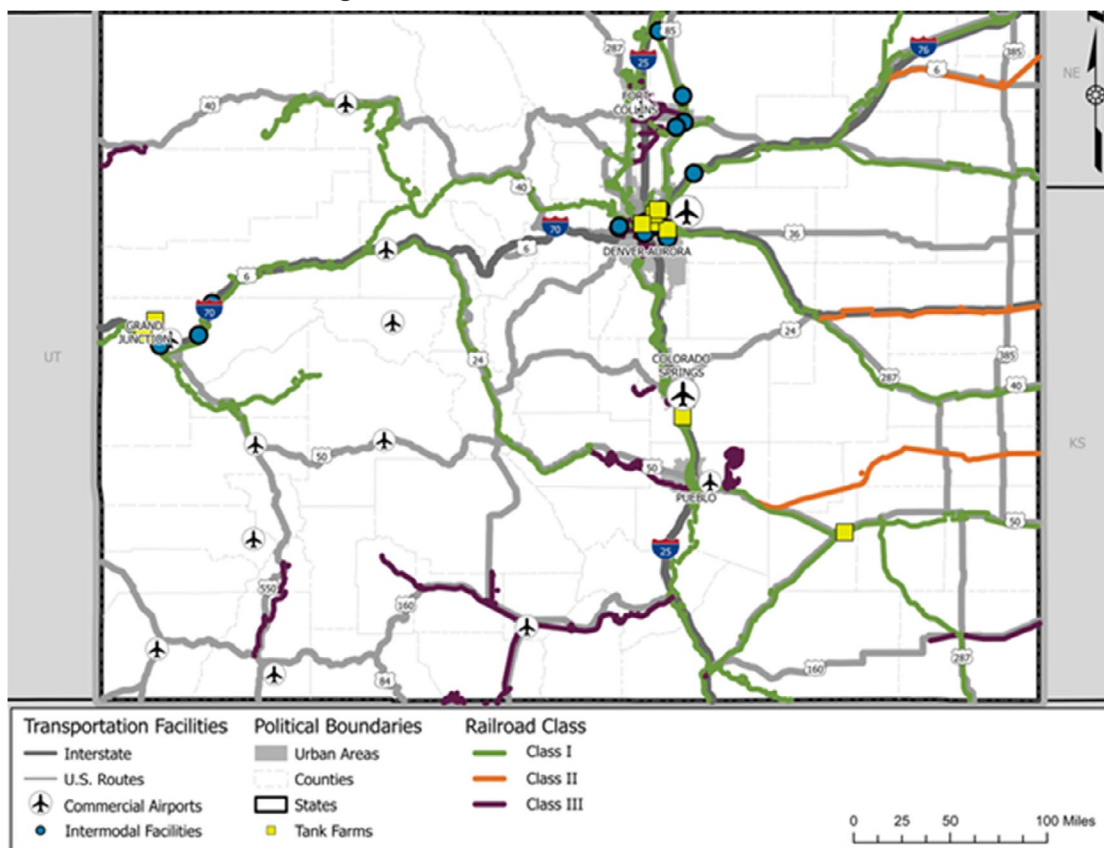
Source: WSP analysis of NPMRDS and TRANSEARCH data

Colorado's Intermodal Freight Transportation Network

As an inland state without any navigable waterways, Colorado relies heavily on its air, rail, and highway infrastructure to support freight industries. Highways, in particular, are integral for to-market goods delivery in the state, as well as the vast majority of middle mile freight transportation. Colorado designates its own distinct freight network, weighing the truck utilization, industries, federal designations, and overall criticality to the movement of freight throughout the state. This network is largely consistent with the higher order corridors of the National Highway System (NHS), but identifies additional corridors primarily in the western and southeastern portion of the state. Routes such as U.S. 160 and SH 141 provide regionally significant connections to main thoroughfares that are notable for statewide freight planning.

Beyond the highway network, an intermodal transportation network integrates different modes of transportation, such as rail and air, to efficiently move goods from origin to destination. The goal of an intermodal network is to leverage the strengths of each mode, creating a seamless and integrated supply chain for the movement of freight or cargo. The combined locations of Colorado's intermodal facilities, including rail lines, airports, gasoline tank farms, and intermodal logistics parks are shown in Figure 5. While many of these facilities are concentrated in Denver, each type of facility can be found throughout the state. This allows for freight and logistics partners to have non-highway options when shipping goods in, out, and through Colorado.

Figure 5. Colorado's Intermodal Network



Source: Cambridge Systematics

Other Key Freight Assets and Conditions

Military Facilities

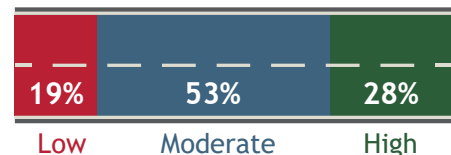
National military assets are critical components of threat recognition, personnel and equipment staging, and strategic response. Colorado is home to some of the Nation's most important military assets. The three main military assets in Colorado are military installations, the Strategic Highway Network (STRAHNET), and the Strategic Rail Corridor Network (STRACNET). Fort Carson, The Airforce Academy, Peterson Air Force Base (AFB), and Buckley AFB are among the 11 installations in the state. Fort Carson also serves as one of 18 national Power Projection Platforms (PPPs). These installations are connected by the STRAHNET (military critical highway routes) and the STRACNET (military critical rail corridors). In Colorado, there are 1,056 miles of STRAHNET and 1,067 of STRACNET.

Truck Parking

In 2019, CDOT conducted a Truck Parking Assessment (TPA) to identify statewide truck parking needs and network gaps on major freight corridors. Based on current usage ratings, most notably sections of I-70 and U.S. 40 in Clear Creek County, U.S. 160 in Costilla and Alamosa counties, and SH 71 in Washington County were identified as lacking available truck parking. Additionally, most highway segments in the Fort Collins and Denver-Aurora regions exhibited heavy truck parking usage. Most acute shortages are in major freight corridors and large metro areas. Extreme weather conditions, wildfires, and other unplanned events can close roads temporarily, creating a large demand for truck parking until the road re-opens.

Pavement Condition

The condition of the roadway system has significant implications for the efficiency, safety, and overall cost-effectiveness of freight transportation. In 2013, CDOT developed the Drivability Life Index which assesses pavement's usable lifespan across the state's entire highway system. It classifies highway pavement conditions into three categories: low, moderate, and high, representing remaining lifespans of 0-3 years (19%), 4-10 years (53%), and more than 10 years (28%).



Bridge Condition

Bridge conditions and clearance restrictions limit freight mobility. For example, bridges with lower clearance allowance may limit load and route choices for trucks. Colorado follows the National Bridge Inventory (NBI) bridge condition rating system of good, fair, and poor. Bridge quality in Colorado is generally very good with only 3.7 percent of NHS bridges (or 109 bridges) with a poor rating, meeting the target of no more than 4 percent of bridges in poor condition. A total of 36.5 percent of bridges were in good condition, compared to Colorado's good condition target of thirty-six percent by 2025.¹ The state has worked to preserve and maintain structures in fair and good conditions, and the good-condition bridge proportion exceeds the expectation.

Truck Chain Stations

In 2011, CDOT initiated the chain law, which requires all commercial vehicles traveling on I-70 between Dotsero exit and Morrison exit to be equipped with sufficient chains from September 1st to May 31st.² The establishment of chain stations provides truck drivers a safe area to equip or remove chains from the vehicle during adverse weather conditions. There are fifty-three designated chain stations along Colorado's roadway network, and twenty-two of them are situated on I-70's mountain corridor as this segment is most likely to experience severe weather.

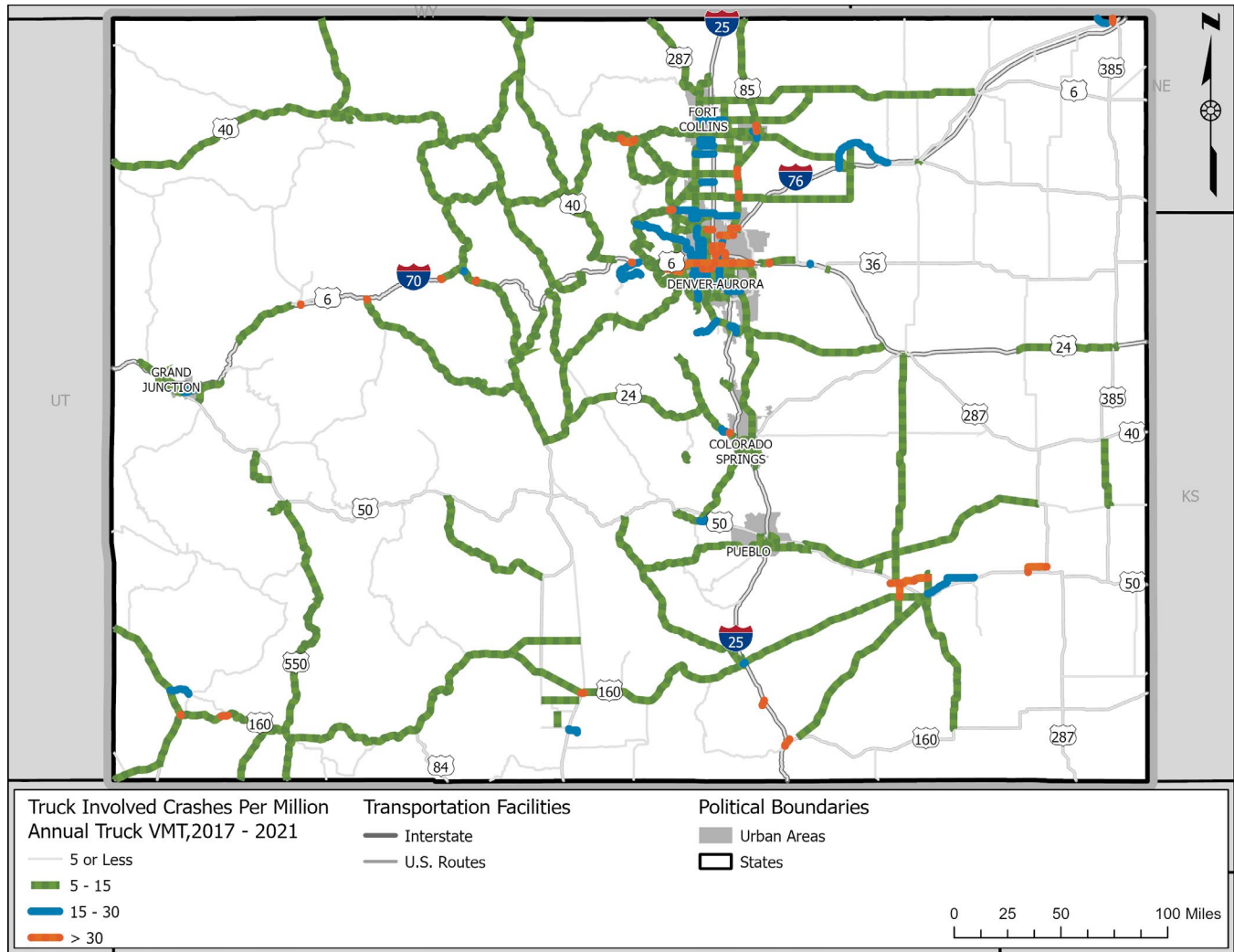
¹ <https://www.codot.gov/programs/tam/cdot-2022-transportation-asset-management-plan-remediated.pdf>

² <https://www.codot.gov/travel/colorado-chain-law>.

Freight Transportation Safety

Safe travel throughout the state ensures both the health and wellbeing of all network, as well as the efficient operation of the freight network. For highway movements, the number of truck-involved crashes has fluctuated, with a significant reduction in 2020 likely due to pandemic and quarantine measures reducing the number of cars on the road. Figure 6 shows a crash density analysis of truck-involved crashes to determine hot-spots. Approximately 63 percent of truck-involved crashes took place on interstates and state highways.

Figure 6. Truck-Involved Crashes Per Million Vehicle Miles Traveled (VMT), 2017-2021



Source: *Crash Data, Colorado Department of Transportation, 2017-2021,*
<https://www.codot.gov/safety/traffic-safety/data-analysis/crash-data>

At-grade rail crossings are places where a rail line intersects with the roadway at the same level, without the usage of bridges or tunnels. These locations can be dangerous for potential conflicts between rail cars and motor vehicles. Between 2012 and 2022, there were fifty-eight railway-truck crossing safety incidents involving trucks and truck-trailers. Most incidents are concentrated in grade crossings near U.S. 85 and I-70 in Denver and north along U.S. 85 towards Fort Collins. These incidents generally involve accidental crashes when trucks attempt to circumvent safety devices, when trucks stall on tracks, or when truck drivers fail to yield at grade crossings.

Aligning National and State Goals

Each fiscal year, CDOT produces a Performance Plan, as required under Colorado Revised Statute C.R.S. § 2-7-204, also known as the State Measurement for Accountable, Responsive and Transparent (SMART) Act. The Performance Plan is CDOT’s strategic roadmap that informs partners about the upcoming fiscal year’s WIGs. The WIGs are ambitious, short-term goals that align the Governor’s Key Priorities with CDOT’s strategic priorities. For fiscal year 2023-2024, the WIGs are:

- **Advancing Transportation Safety** - Advance the safety of Colorado’s transportation system so all travelers arrive at their destination safely.
- **Accountability & Transparency** - Ensure efficient use of taxpayer funds and efficient construction project delivery.
- **Clean Transportation** - Reduce pollution from the transportation sector.
- **Statewide Transit** - Relieve traffic congestion with connected statewide transit and rail services.³

Colorado’s multimodal freight goals support national multimodal freight goals established by the FAST Act and revised by the 2021 Bipartisan Infrastructure Law (BIL). These national goals focus on investments in infrastructure and operational improvements that strengthen economic competitiveness, reduce the cost of transportation, improve reliability, and increase productivity. Safety, security, and resiliency are also emphasized, along with improving the state of good repair of the highway system. National goals also align with CDOT’s recent efforts to innovate and leverage advanced technology and support state flexibility to address freight connectivity. CDOT’s Policy Directive 14 (PD-14) provides performance targets to measure the success of the Department’s efforts to improve in the following key areas: safety, asset management, and mobility. The table below shows the alignment of Colorado’s PD-14 and WIGs with both the national freight goals and the goals of this Colorado Freight Plan.

Table 1. Linking Shared National and State Goals

COLORADO FREIGHT PLAN GOALS	Safety & Security	Mobility	Maintenance	Economic Vitality	Sustainability & Resiliency
NATIONAL FREIGHT GOALS	» Safety and security	» Congestion » Reliability » Goods Movement » Innovation and Technology	» State of Good Repair	» Economic Efficiency and Productivity » Multi-State Planning	» Resiliency » Environmental
COLORADO WILDLY IMPORTANT GOALS	Advancing Transportation Safety	Accountability and Transparency		Statewide Transit	Clean Transportation
PD-14	Safety	Mobility	Asset Management		

Strategies

Strategies for accomplishing the State Freight Plan goals include recommendations within the prior Colorado Highway Freight Plan, actions to address needs and issues raised through the plan development process, recommendations from stakeholders, and best practices from other state freight planning efforts. The strategies are aligned with the overall goals of the Colorado Freight Plan.

³ Performance Plan and Reports. Colorado Department of Transportation. <https://www.codot.gov/performance/performance-plan>

National Highway Freight Program

The NHFP is a formula-based funding program that supports investments in the NHFN. To be funded through the NHFP, potential projects must be incorporated within a state Freight Investment Plan (FIP) and contribute to efficient goods movement on the NHFN. Funding eligibility covers all planning, feasibility, preconstruction, mitigation, and construction activities for highway, bridge, and multimodal capacity, safety, and operational projects. Investments in technology, safety, operations, parking, security, and alternative fuels to improve system performance are also eligible. Strategic planning, analysis, and data collections efforts are also eligible through this program. Each fiscal year, up to thirty percent of NHFP funds may be used for intermodal or freight rail projects, including improvements located within private facilities. Colorado’s FIP provides a framework to leverage and direct NHFP funding toward targeted programmatic investment areas.

Colorado Freight Investment Plan

Colorado’s multimodal freight system investment needs significantly exceed dedicated freight funding available through the NHFP. To balance needs against available funding, while improving Colorado’s multimodal freight network, CDOT employs a performance-based process to guide allocation of NHFP funding.

To be considered for funding under Colorado’s multimodal FIP, projects should clearly:

- Support NHFP and CFP multimodal freight goals and performance targets;
- Emphasize safety, mobility, or condition improvements on Colorado Freight Corridors that benefit trade and transport on a broader regional or interstate level;
- Demonstrate a clear freight nexus that directly impact freight-reliant industries or where goods movement is the primary rationale and direct beneficiary of the improvement;
- Indicate how funds will address immediate freight issues and advance projects toward construction and implementation; and,
- Address high-priority focus areas of truck safety, freight operations and clean transportation.

The FIP directs future freight-related investments towards initiatives that directly support national and state performance goals. CDOT works with local agencies and regional planning partners to identify key needs and potential investments that align with the CFP system-wide goals of safety, mobility, economic vitality, maintenance, and sustainability. Performance measures, project evaluation criteria, and project prioritization principles are also developed with partners to guide project selection. Projects are evaluated in cooperation with the FAC and Engineering Regions and prioritization results are used as input into final programming decisions. By prioritizing freight projects and considering state, system, and stakeholder investment priorities, CDOT’s process maximizes investments and delivers a more effective freight program.

