



COLORADO

Department of  
Transportation

# STATE HIGHWAY FREIGHT PLAN



July 8, 2015

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# CHAPTER I: INTRODUCTION

## CHAPTER I KEY POINTS

- Exports from Colorado contribute \$79 billion to the Gross Regional Product of the state's economy.
- Development of a State Highway Freight Plan is a two-phased process that is MAP-21 compliant and fosters Statewide Transportation Advisory Committee (STAC), Transit and Rail Advisory Committee (TRAC), and Freight Advisory Council (FAC) collaboration.
- Freight Corridors have been identified for Colorado with input from the freight industry, and other key stakeholders.

The reliable movement of goods affects our daily lives. Almost every item in our homes and every product on our store shelves have been transported as freight. Every commercial enterprise requires resources delivered as freight, whether it be raw materials, or finished products to serve its clientele. The necessities of the modern world, so readily available, are delivered through a complex system of sourcing, production, and transportation that spans states, countries, and the globe. Perhaps most importantly, every shipment of goods provides tangible economic benefits to Colorado's people, businesses, communities, and the broader state economy.

Freight movement is closely connected to the health of our economy and the transportation system in our state. The Colorado Freight System, which includes highways, rail lines, airports, and other intermodal facilities, delivers goods, creates jobs, and provides economic opportunities to people across the state. The transportation and warehousing sector in Colorado contributed \$5.9 billion to Colorado's Gross Regional Product (GRP) in 2012 (source: OEDIT 2013). GRP is a state level indicator that is similar to the Gross Domestic Product at the national level. Although representing only a small portion of the state's GRP, the transportation and warehousing sector is vital to the success of Colorado's economy because it provides a critical link to almost every other industry. A number of Colorado's key industries, including agriculture, energy development, and the aerospace industry, rely heavily on the movement of freight in order to produce and deliver their products to market in a timely and cost-effective manner. Businesses transport their products within the state and export goods to other states and countries. Exports from Colorado contribute approximately \$79 billion to Colorado's \$262 billion GRP each year (source: CDOT, Economic Valuation of the State Highway System, 2013).

Freight will continue to serve a vital need in the future. Colorado's population is projected to grow to over 7.8 million residents by 2040 (source: Colorado State Demographers Office, 2013), meaning that more freight movement will become necessary to meet the demand for goods and services. Given that a great majority of this growth is expected to occur within the I-25 and I-70 corridors, and that significant highway expansion is not likely, congestion will continue to be a challenge for freight movement in the future. When these projections are combined with economic growth in key industries, it is clear that Colorado's future economic vitality relies on the continuation of a well-functioning and integrated statewide freight system. In order to make this a reality, we need to start planning now.

## PHASED APPROACH

The Colorado Department of Transportation (CDOT) is developing its freight plan in two phases in order to:

- Collect and analyze data on highway freight and freight industry needs.
- More quickly position itself for the increased federal share for freight funding under MAP-21 (MAP-21 is described in more detail in Chapters II and III). The increased federal share reduces the local match requirement for eligible projects, but does not increase the total amount of federal funding received by the state.
- Provide additional opportunity to work with key stakeholders, industry, and planning partners (members of Metropolitan Planning Organizations [MPOs] and rural Transportation Planning Regions [TPRs]) to integrate highway freight, freight rail, and aviation modes, incorporate additional input, identify coordinated strategies, and develop an implementation plan.

Phases will occur as follows:

- Phase I (State Highway Freight Plan):
  - Collect and analyze data.
  - Engage freight industry to identify needs.
  - Develop the State Highway Freight Plan to meet MAP-21 requirements and submit to FHWA.

■ Phase II (Integrated Freight Plan):

- Develop approach to integrate highway freight planning with freight rail and aviation planning.
- Continue to work with key stakeholders and planning partners to incorporate additional input, strategies, and develop an integrated implementation plan.
- Re-establish industry engagement via the FAC and expand membership to other key stakeholders and planning partners, including the STAC and TRAC. See Chapter IV for more details on key stakeholders and planning partners.
- Develop freight strategies integrating highway freight, freight rail, and aviation.

## FREIGHT RAIL AND AVIATION

This State Highway Freight Plan, developed as part of Phase I, focuses on freight movement primarily along Colorado’s state highways. The other freight modes -- rail and aviation -- will be integrated further during Phase II of the freight planning process. Pipelines are another freight mode in Colorado and are regulated by the Public Utility Commission (PUC) and the Pipeline Hazardous Material Safety Administration (PHMSA). Currently, freight activities on non-highway modes are addressed in two other statewide plans -- the 2012 Colorado State Freight and Passenger Rail Plan and the 2011 Colorado Aviation System Plan. These two plans will serve as a resource when integrating rail and aviation into the Phase II plan.

## COLORADO’S STATE HIGHWAY SYSTEM

CDOT’s mission is to:

*To provide the best multimodal transportation system for Colorado that most effectively and safely moves people, goods, and information.*

Colorado’s State Highway System, depicted in Figure 1, includes 9,104 centerline miles and more than 23,000 total lane miles. CDOT is responsible for the construction, maintenance, and operations of this State Highway System, which also includes 3,454

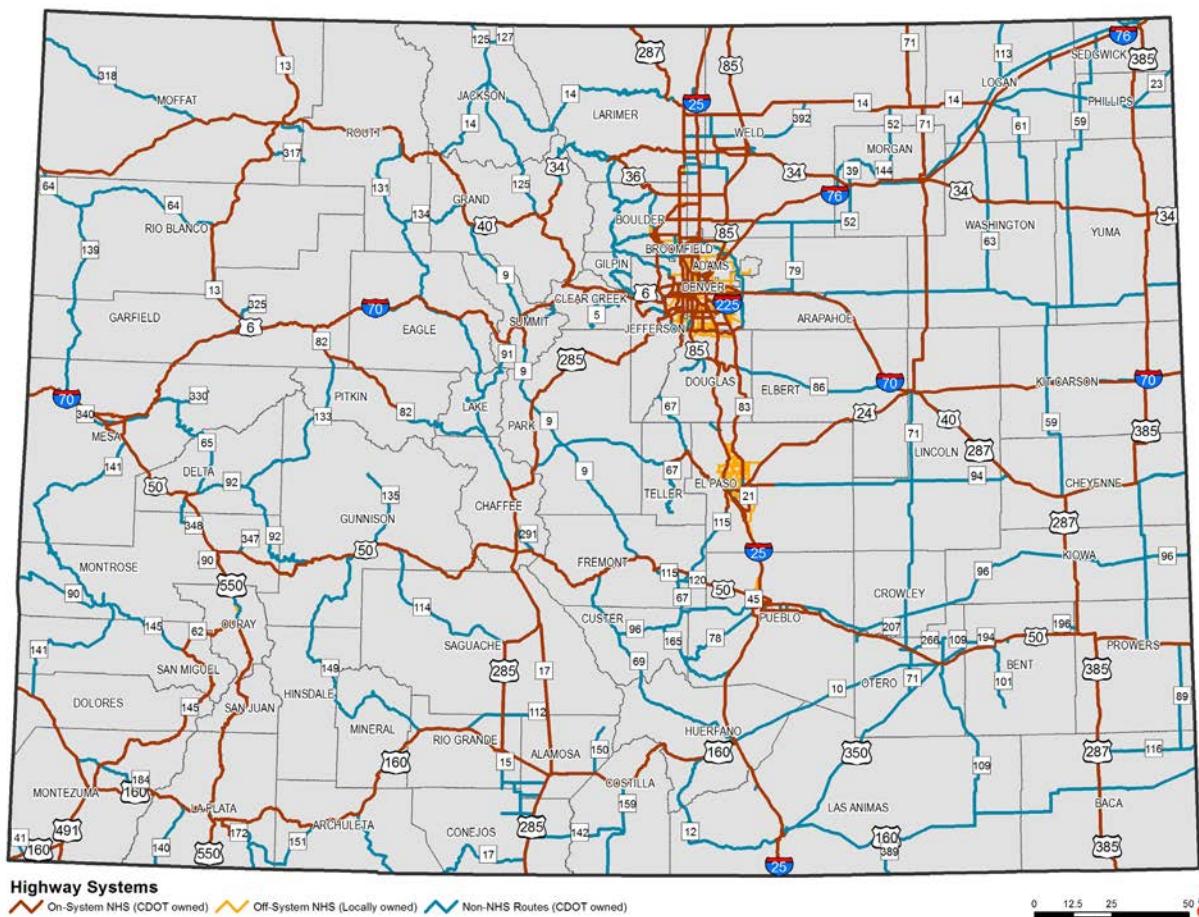


Figure 1: Colorado State Highway System

Source: CDOT, 2013

bridges, 21 tunnels, 6,064 culverts, and 35 year-round mountain passes. The entire system spans a wide variety of landscapes and elevations, and often experiences extremes of temperature and weather.

The State Highway System, as defined in this plan, includes all of the highways that CDOT owns, operates, and maintains. The State Highway System includes roadways in both rural and urban areas, many of which serve as main streets or key arterial roads in local communities. Colorado's State Highway System has approximately 9,104 centerline highway miles of which: 952 miles are interstates, 3,497 miles are US Highways, and 4,654 miles are State Routes.

A subset of the State Highway System includes a portion of the National Highway System (NHS). NHS facilities are routes designated as important to the nation's economy, defense, and mobility. NHS facilities can be either on-system (CDOT owned, operated, and maintained) or off-system (locally owned and maintained by cities and counties). The off-system NHS routes are not part of the State Highway System.

The State Highway System includes:

**NHS On-System routes**, which include all of the Interstates (e.g., I-70, I-25), various US Highways (e.g., US 40, US 50) and certain State Routes (e.g., SH 13, SH 71). Colorado NHS on-system routes total approximately 4,423 highway miles.

**Non-NHS routes**, which are US Highways and State Routes that are not designated on the NHS but are owned, operated, and maintained by CDOT. A few US Highways are not on the NHS; for example US 350 and a portion of US 160. State Routes, for example sections of SH 318, and SH 149 are additional highways not on the NHS that are owned, operated, and maintained by CDOT, and provide important state connections between cities, towns, and other highways. Colorado Non-NHS routes total approximately 4,680 highway miles.

## LOCAL ROADS

Local roads and NHS facilities not on the State Highway System include the remaining roads throughout the state that CDOT does not own, operate or maintain. Local roads are generally the responsibility of the local cities and counties. However, certain local roads are part of the NHS, and receive federal transportation funding for improvements. Some of these local roads are labeled Off-System NHS, because they are not part of the State Highway System as defined above. Local roads in Colorado total approximately 12,068 highway miles, including 485 miles of Off-System NHS routes. Many local roads are neighborhood streets with low traffic volumes.

## INTERMODAL CONNECTORS AND FACILITIES

Intermodal connectors are state highway and other off-system roadways that provide access to major intermodal freight facilities. FHWA has identified 15 such facilities in Colorado that include airports, truck/rail facilities, and truck/pipeline facilities. These facilities are presented and described in Figure 2 and Table 1.

The incorporation of intermodal facilities and other facilities (e.g., off-system NHS) that support the movement of freight, but are not part of the State Highway System will be a key topic covered during the development of the Integrated Freight Plan, Phase II of the freight planning process.

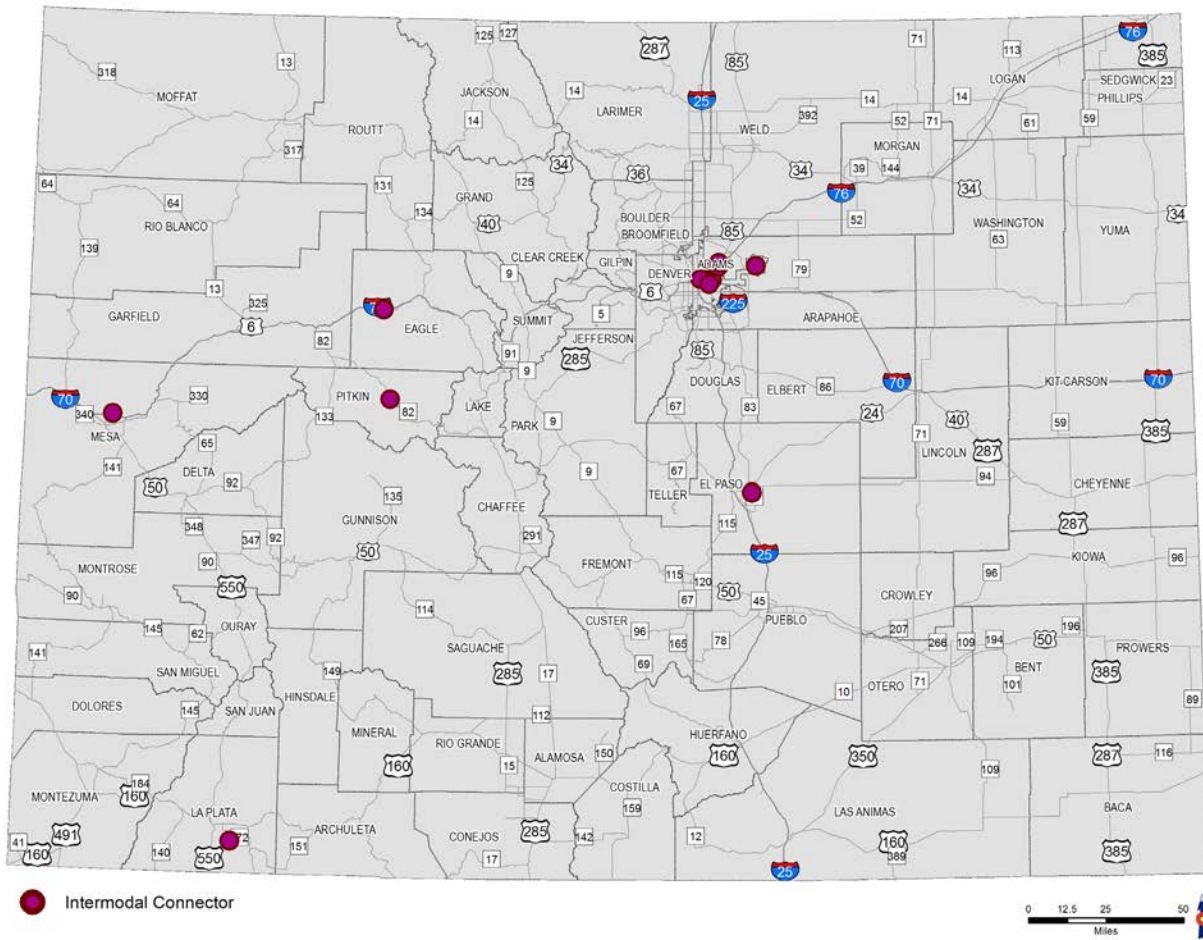


Figure 2: Colorado Intermodal Connectors

Source: CDOT, 2014

Table 1: Intermodal Connectors

FREIGHT FACILITIES SERVED BY INTERMODAL CONNECTORS	INTERMODAL TYPE
ASPEN-PITKIN COUNTY AIRPORT	AIRPORT
BURLINGTON NORTHERN RR AUTO TRANSFER	TRUCK/RAIL FACILITY
BURLINGTON NORTHERN RR TRANSFER FACILITY	TRUCK/RAIL FACILITY
COLORADO SPRINGS AIRPORT	AIRPORT
CONOCO PIPELINE TRANSFER	TRUCK/PIPELINE TERMINAL
DENVER INTERNATIONAL AIRPORT	AIRPORT
DURANGO-LA PLATA COUNTY AIRPORT	AIRPORT
EAGLE COUNTY REGIONAL AIRPORT	AIRPORT
KANEB PIPELINE TRANSFER	TRUCK/PIPELINE TERMINAL
PHILLIPS PIPELINE	TRUCK/PIPELINE TERMINAL
SOUTHERN PACIFIC RR TRANSFER FACILITY	TRUCK/RAIL FACILITY
TOTAL PETROLEUM PIPELINE TERMINAL	TRUCK/PIPELINE TERMINAL
UNION PACIFIC RR AUTO TRANSFER	TRUCK/RAIL FACILITY
UNION PACIFIC RR TRANSFER FACILITY	TRUCK/RAIL FACILITY
GRAND JUNCTION REGIONAL AIRPORT	AIRPORT

# FREIGHT CORRIDORS

Freight on Colorado’s State Highway System is key to Colorado’s economic prosperity because it represents the economy in motion. Efficient and reliable truck deliveries allow businesses, residents, and visitors to get the right products to the right people at the right time at a reasonable cost. If freight stops, the economy stops.

During Phase I, Freight Corridors on the State Highway System were identified using criteria based on:

- Annual Average Daily Truck Traffic (AADTT)
- Percentage of Trucks
- Truck Throughput
- Roadway Classification
- Urban or Rural Classification
- Network Connectivity
- Industry Stakeholders

Freight industry engagement via the FAC supported this identification effort. See Chapter V for more detailed information on the method used to identify Freight Corridors.

Colorado State Highway Freight Corridors, shown in Figure 3, include 4,156 centerline miles and 12,116 total lane miles. These roadways are considered critical for the interregional, intrastate, interstate, national, and international movement of freight, and they include the entirety of the state’s interstate highways (I-25, I-70, and I-76), roughly 87% of the state’s on-system NHS roadway, all four High Priority Corridors as defined by the Intermodal Surface Transportation Efficiency Act (ISTEA) (the 1991 federal authorization bill for transportation), and those primary and secondary roads providing access to the state’s 15 intermodal connectors. Elements of the Freight Corridor System: Federally Designated High Priority Corridors, intermodal connectors, and other attributes of the Freight Corridors are discussed in more detail in Chapter V. See Appendix A for information on facilities with national freight designations.

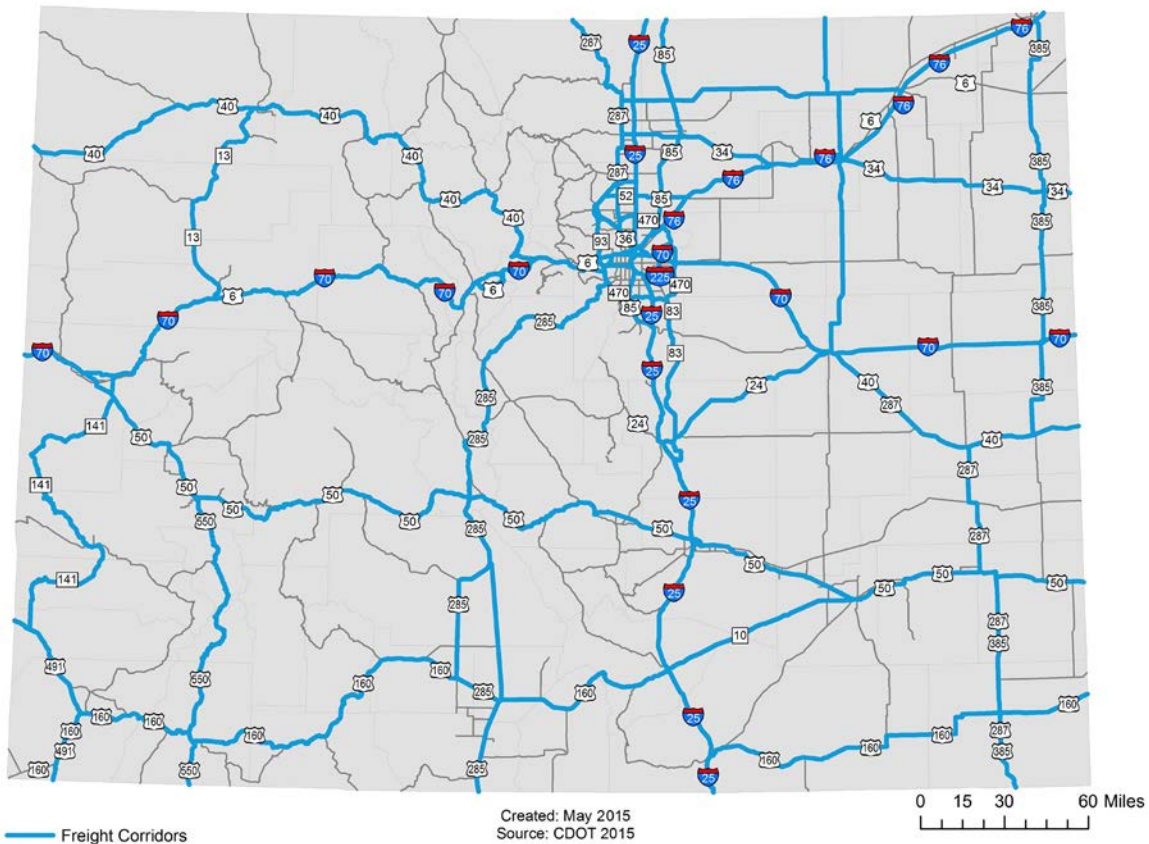


Figure 3: Colorado State Highway Freight Corridors

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# CHAPTER II: PURPOSE OF THE STATE HIGHWAY FREIGHT PLAN

## CHAPTER II KEY POINTS

- An increased federal share under Moving Ahead for Progress in the 21st Century (MAP-21) (82.79% up to 95%), permits freight projects to receive a higher percentage of the existing federal dollars states receive to go to projects that improve freight movement.
- A vision, goals and objectives for Colorado’s freight system are outlined in this Plan.
- Strategies have been identified to help CDOT meet the objectives of this Plan. An implementation framework and performance measures to track Plan progress have been developed.

This Plan is intended to guide improvement of the overall effectiveness of the Colorado Freight System and support the vision of a safe, efficient, coordinated, and reliable system for the movement of freight.

This State Highway Freight Plan complies with the most recent transportation legislation, MAP-21, and positions CDOT to become eligible for an increased federal share (from 82.79% up to 95%) for freight funding. The increased federal share reduces the local match requirement for eligible projects, but does not increase the total amount of federal funding received by the state. MAP-21 requires states to have a freight plan as a condition for applying for increased freight funding in the future. More details on MAP-21 and its requirements for a freight plan are provided in Chapter III.

The development of the Plan was also guided by state planning regulations, specifically the 2009 Funding Advancements for Surface Transportation and Economic Recovery (FASTER) Act. FASTER outlined seven key planning factors to be addressed by CDOT, one of which is “effective, efficient, and safe freight transport.” The seven FASTER planning factors are as follows:

- Preservation of the existing transportation system infrastructure
- Safety enhancement
- Strategic mobility and multimodal choice
- Support of urban or rural mass transit
- Environmental stewardship
- Effective, efficient, and safe freight transport
- Reduction of greenhouse gas emissions

In addition to these federal and state requirements, more specific objectives were developed through plan scoping meetings and discussions with freight industry stakeholders. The objectives provide a framework for how the Plan will be implemented and how it will be used in relation to other CDOT plans. Further refinement of implementation strategies will occur during development of the Integrated Freight Plan.

### VISION

The Colorado Freight System will support the economic vitality of the state by providing for the safe, efficient, coordinated, and reliable movement of freight.

### GOALS

Improve the **SAFETY** of the Colorado Freight System.

Improve the **MOBILITY** of the Colorado Freight System.

Improve **ECONOMIC VITALITY** through freight investment, programs, and initiatives.

Improve **MAINTENANCE** of the Colorado Freight System.

Improve **SUSTAINABILITY** and reduce **ENVIRONMENTAL** impacts of freight movement.

Objectives of the State Highway Freight Plan by goal area are:

#### SAFETY:

- Reduce the number of fatalities and serious injuries on Freight Corridors.
- Reduce the number of truck crashes statewide.
- Reduce truck crashes on Freight Corridors and in commercial vehicle crash hot spots.
- Address highway geometric issues affecting freight safety and movement.

#### MOBILITY:

- Limit increases in congestion and increase travel reliability (as measured by Planning Time Index).
- Improve connectivity between freight facilities and destinations.
- Mitigate non-recurring congestion and improve travel time by reducing crashes on Freight Corridors and improving clearance time.
- Maintain mobility of the freight system during natural disasters and extreme weather events.

#### ECONOMIC VITALITY:

- Support freight decision-making through expanded analysis, dissemination, and use of data and industry trends in the planning process.
- Identify freight investments, programs, and initiatives that enhance the competitiveness of the Colorado Freight System.

#### MAINTENANCE:

- Improve bridge and pavement condition on Freight Corridors.
- Maintain auxiliary assets (lights, signage, tunnels, culverts, etc.) on Freight Corridors.

#### SUSTAINABILITY AND ENVIRONMENT:

- Improve the energy efficiency of freight movement and reduce the associated levels of greenhouse gas emissions.

## PLAN INTEGRATION

This Plan focuses on freight movement primarily on the State Highway System, connectivity between modes, and integration of key goals, objectives, and strategies from the 2040 Statewide Transportation Plan with those of CDOT's other modal and topical plans, including:

- Statewide Transit Plan
- Strategic Highway Safety Plan
- Statewide Transportation System Management and Operations Plan
- Freight and Passenger Rail Plan
- Bicycle and Pedestrian Plan
- Aviation Plan
- Risk-Based Asset Management Plan
- CDOT Action Plan

This Plan includes a vision for the Colorado Freight System and outlines issues and opportunities related to the safety, mobility, connectivity, economic vitality, system maintenance, and environmental aspects of the freight sector. It then proposes improvement and policy strategies to achieve the goals and objectives for each of these areas and provides an implementation framework and performance measures to track progress made. See more details on the strategies, and performance measures in Chapters VII and VIII. See more information regarding the implementation framework in Chapter IX.



# CHAPTER III: NATIONAL FREIGHT POLICY AND REQUIREMENTS

## CHAPTER III KEY POINTS

- MAP-21 Section 1116 established a national freight policy.
- Seven national freight policy goals and six plan content requirements are identified in the MAP-21 regulations.

MAP-21 Section 1116 established a national freight policy, creating a framework for the federal government and state transportation departments for future freight transportation planning, programs and decision-making. It states that:

*“It is the policy of the United States to improve the condition and performance of the national freight network to ensure that the national freight network provides the foundation for the United States to compete in the global economy and achieve each goal described in subsection (b)...” 23 U.S. Code § 167.*

The goals of the national freight policy (described in subsection (b) of 23 U.S. Code § 167) are:

- To invest in infrastructure improvements and to implement operational improvements that:
  - Strengthen the contribution of the national freight network to the economic competitiveness of the United States;
  - Reduce congestion;
  - Increase productivity, particularly for domestic industries and businesses that create high-value jobs;
- To improve the safety, security, and resilience of freight transportation;
- To improve the state of good repair of the national freight network;
- Use advanced technology to improve the safety and efficiency of the national freight network;



- To incorporate concepts of performance, innovation, competition, and accountability into the operation and maintenance of the national freight network;
- To improve the economic efficiency of the national freight network; and
- To reduce the environmental impacts of freight movement on the national freight network.

## FREIGHT PLAN REQUIREMENTS

MAP-21 further established freight plan requirements in alignment with the national freight policy. MAP-21 freight plan requirements include:

**Requirement 1:** An identification of significant freight system trends, needs, and issues with respect to the State.

**Requirement 2:** A description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the State. MAP-21 has identified two freight related performance measures which will be implemented when guidance is finalized by FHWA: Hours of Truck Delay and Truck Reliability Index.

**Requirement 3:** The Plan should improve the ability of the State to meet the national freight goals established under section 167 of title 23, U.S. Code.

**Requirement 4:** Evidence of consideration of innovative technologies and operational strategies, including intelligent transportation systems that improve the safety and efficiency of freight movement.

**Requirement 5:** In the case of routes on which travel by heavy vehicles (including mining, agricultural, energy cargo or equipment, and timber) is projected to substantially deteriorate the condition of roadways, a description of improvements that may be required to reduce or impede the deterioration.

**Requirement 6:** An inventory of facilities with freight mobility issues, such as truck bottlenecks, within the State, and a description of the strategies the State is employing to address those freight mobility issues.

While federal law does not require the states to have freight plans, the inclusion of projects for consideration in a State Freight Plan is an express statutory requirement to be eligible for increased federal share from the normal 82.79% to 95% for interstate projects that improve freight movement or 90% for any other projects that meet the requirements of the legislation. This State Highway Freight Plan will position CDOT for the increased federal share for freight projects. The increased federal share reduces the local match requirement for eligible projects, but does not increase the total amount of federal funding received by the state.

To be eligible for the increased federal share projects must demonstrate an improvement to the efficient movement of freight, including making progress toward meeting performance targets for freight to be established under MAP-21. States should describe how the project makes progress toward achieving the national goal for freight movement and economic vitality stipulated in regulations to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

The U.S. Department of Transportation (DOT) is required to establish measures for states to use to assess freight movement on the Interstate System, per MAP-21 §1203 and 23 USC 150(c). These freight performance measures are forthcoming. Once these performance measures are identified, each state will be required to set performance targets in relation to the federal measures, and integrate the targets within their planning processes. States will also be required to report periodically on their progress in relation to meeting targets, and on how they are addressing congestion at freight bottlenecks. [§1201, 1203; 23 USC 135(d)(2), 135(f)(7), 150(d)-(e)]. (Source: <http://www.fhwa.dot.gov/map21/factsheets/freight.cfm>).

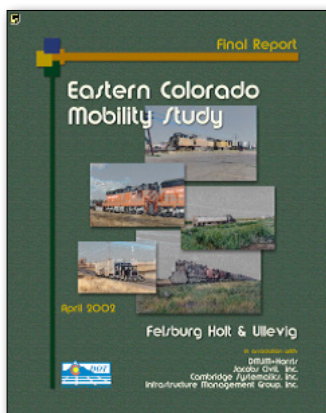
# CHAPTER IV: STAKEHOLDER ENGAGEMENT

## CHAPTER IV KEY POINTS

- Previous freight planning efforts served as the foundation for the current State Highway Freight Plan development process.
- Stakeholder input and comprehensive freight data were integral in the development of the State Highway Freight Plan.
- Stakeholders' top concerns centered on safety, maintenance, mobility, and support for economic vitality.
- Data analysis was performed to identify current and potential future conditions of the Colorado Freight Corridors.

## PRIOR FREIGHT PLANNING EFFORTS

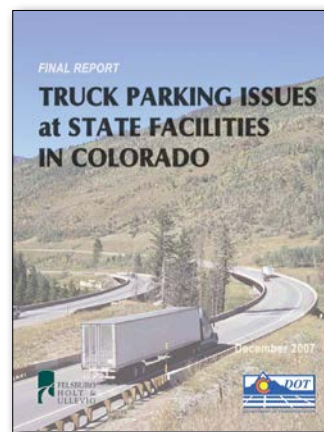
CDOT has performed a number of studies and activities in the past that were intended to help address freight issues faced by the state at the time of their publication. These documents served as a resource and foundation for the state's first State Highway Freight Plan, which seeks to build upon their findings and recommendations. The major freight studies and reports utilized during this plan's development process are discussed below.



### EASTERN COLORADO MOBILITY STUDY (2002)

The Eastern Colorado Mobility Study was conducted to evaluate the feasibility of improving existing and/or constructing future transportation corridors and intermodal facilities to enhance the mobility of freight services within and through eastern Colorado. One of the recommendations of this study was the establishment of a Freight Advisory Council (FAC)

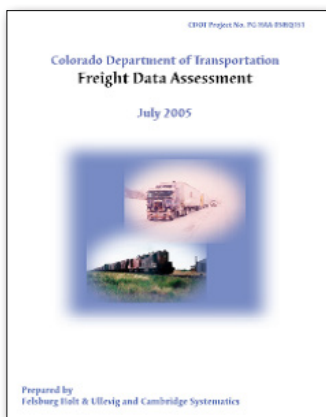
to support freight planning activities in Colorado, which has since been implemented. Another development related to the study is the recent redevelopment of the two lane US 287 Ports-to-Plains route to a "Super Two" configuration with wider shoulders and more frequent passing lanes.



### TRUCK PARKING ISSUES AT STATE FACILITIES IN COLORADO (2007)

The Truck Parking Issues at State Facilities in Colorado study was conducted to identify the deficiencies in truck parking throughout Colorado, identify potential public and private opportunities to expand available parking, and make recommendations on alternative policy approaches to the issue.

In 2012, CDOT Region 1 produced a Colorado Truck Parking Guide aimed at improving safety and convenience for truck operators on interstates in Colorado, and an update to this effort is one of the strategies recommended in Chapter VIII of this State Highway Freight Plan.



### FREIGHT DATA ASSESSMENT (2005)

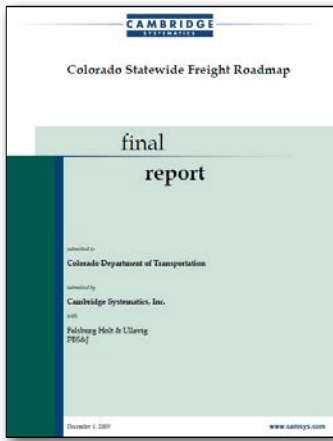
The Freight Data Assessment's primary objectives were to identify current and future freight data requirements, to assess the availability and the quality of such freight data, and to develop a framework plan to collect, maintain and make available needed freight data. This assessment report recommended the completion of a number of surveys and analyses related to freight flow,

economic significance, and origins and destinations of freight traffic. As a result of this study, a pilot Origin and Destination Study was completed in 2008 and is described on this page.



### FREIGHT ORIGIN AND DESTINATION PILOT STUDY (2008)

The Freight Origin and Destination Pilot Study was designed to lay out a framework for future data collection activities related to freight movement within Colorado. This pilot study is considered the first step in the implementation of the Freight Data Assessment that was published in 2005.



## COLORADO FREIGHT ROADMAP (2009)

The Colorado Freight Roadmap was developed to determine the current conditions of freight-related issues within the state, identify areas in need of improvement, gain consensus on a clear vision for a statewide freight program, and establish goals to realize that vision. It was meant to serve as a roadmap to guide CDOT in the future

development of the transportation system and navigate emerging trends with the potential to affect freight movement in Colorado moving forward.

A number of the tasks identified for implementation have been completed in the years since the Freight Roadmap was finalized. These include the development of the Statewide Freight and Passenger Rail Plan, the inclusion of freight issues in the CDOT NEPA manual, and a restructuring of the FAC. Other tasks included in the Freight Roadmap that are currently underway include the development of a Statewide Travel Demand Model, the investigation of the potential for truck stop electrification, and the development of Priority Freight Corridors.

## STAKEHOLDER ENGAGEMENT

Stakeholder outreach related to the development of this State Highway Freight Plan included engagement with the FAC and outreach that occurred during the development of the 2040 Statewide Transportation Plan. Stakeholders that provided input included: the FAC, CDOT staff, Federal Highway Administration staff, Metropolitan Planning Organizations (MPOs), Transportation Planning Regions (TPRs), and the public. The freight-specific goals of the stakeholder outreach were to:

- Identify potential projects that would be most effective in supporting freight movement and the economy, if additional funds were identified
- Solicit input on strategies to make businesses and communities more economically competitive, including the freight sector

## FREIGHT ADVISORY COUNCIL

A FAC was formed in 2013 to provide input on freight industry needs and collect data for Phase I of the freight planning process. The formation of the FAC provided a forum for a discussion of freight needs and issues with industry. The objectives of the FAC upon formation were to:

- Serve as a forum for discussion regarding freight movement and infrastructure in Colorado
- Educate freight interests regarding the local, regional, and statewide transportation planning processes
- Educate the public sector regarding the importance of freight infrastructure improvements throughout the state
- Improve statewide understanding of the importance of freight transportation to the state of Colorado
- Assist in the development of the State Highway Freight Plan

The membership of the FAC constituted a wide array of stakeholders with interest in freight. The following industries and groups were represented on the FAC:

- BNSF Railway
- Colorado Motor Carriers Association
- Colorado State Patrol
- Colorado Wyoming Petroleum Marketers Association
- Denver International Airport
- Colorado Office of Economic Development and International Trade
- OmniTrax
- Port-to-Plains Alliance
- Union Pacific Railroad
- University of Denver

The FAC worked with staff to identify a freight vision, and develop goals, objectives, and strategies to implement the Plan. The continued participation of industry through the FAC, and the participation of stakeholders from the TPRs and MPOs will be critical to implementation of the Plan.

## CONSISTENT FAC THEMES

Consistent themes which came from the discussions with the FAC included the need for:

- Improved intermodal connectivity.
- Resolution to last-mile (the last leg of the trip required for final delivery of goods) issues including but not limited to: limited parking opportunities especially in downtown areas, and safety concerns related to making deliveries in congested areas.
- Increased collaboration between the public and private sectors.

In Phase II, which includes the development of the Integrated Freight Plan, a FAC including freight industry representatives and a broader group of freight stakeholders, including CDOT's planning partners, will convene to guide the process of the integration of other freight modes, and identify implementation actions for the Integrated Freight Plan.

## TRANSPORTATION PLANNING REGIONS AND METROPOLITAN PLANNING ORGANIZATIONS

Stakeholders from Colorado's 10 Transportation Planning Regions (TPRs) and five Metropolitan Planning Organizations (MPOs) provided additional input during the development of the 2040 Statewide Transportation Plan. This coordination took the form of participation in periodic regional plan development meetings in communities statewide as well as presentations and discussion with the Statewide Transportation Advisory Committee (STAC), which is composed of representatives from each TPR and MPO. Colorado's 10 TPRs and five MPOs are as follows, and are depicted graphically in Figure 4.

- Central Front Range TPR
- Eastern TPR
- Gunnison Valley TPR
- Intermountain TPR
- Northwest TPR
- San Luis Valley TPR
- South Central TPR
- Southeast TPR
- Southwest TPR
- Upper Front Range TPR
- Denver Regional Council of Governments (DRCOG)
- Grand Valley MPO (GVMPO)
- North Front Range MPO (NFRMPO)
- Pikes Peak Area Council of Governments (PPACG)
- Pueblo Area Council of Governments (PACOG)

As part of this 2040 Statewide Transportation Plan development, CDOT and its TPR and MPO planning partners engaged in an extensive and multifaceted public outreach effort to better understand the needs and desires of the public at large, including those related to freight issues. Between 2013 and 2014, over 60,000 Coloradans participated in this outreach effort, which employed a variety of approaches discussed below.

- Press releases, newspapers, radio, public access TV announcements, and letters to the editor
- 2040 Statewide Transportation Plan website: [www.ColoradoTransportationMatters.com](http://www.ColoradoTransportationMatters.com)
- Public surveys - online and hard copy
- Online mini-polls
- Environmental webinars with transportation planning regions, state and federal agencies, and environmental advocacy groups
- 16 Telephone Town Halls - interactive public meetings conducted over the telephone and hosted by local officials and Colorado Transportation Commissioners
- Public meetings with the TPRs and MPOs

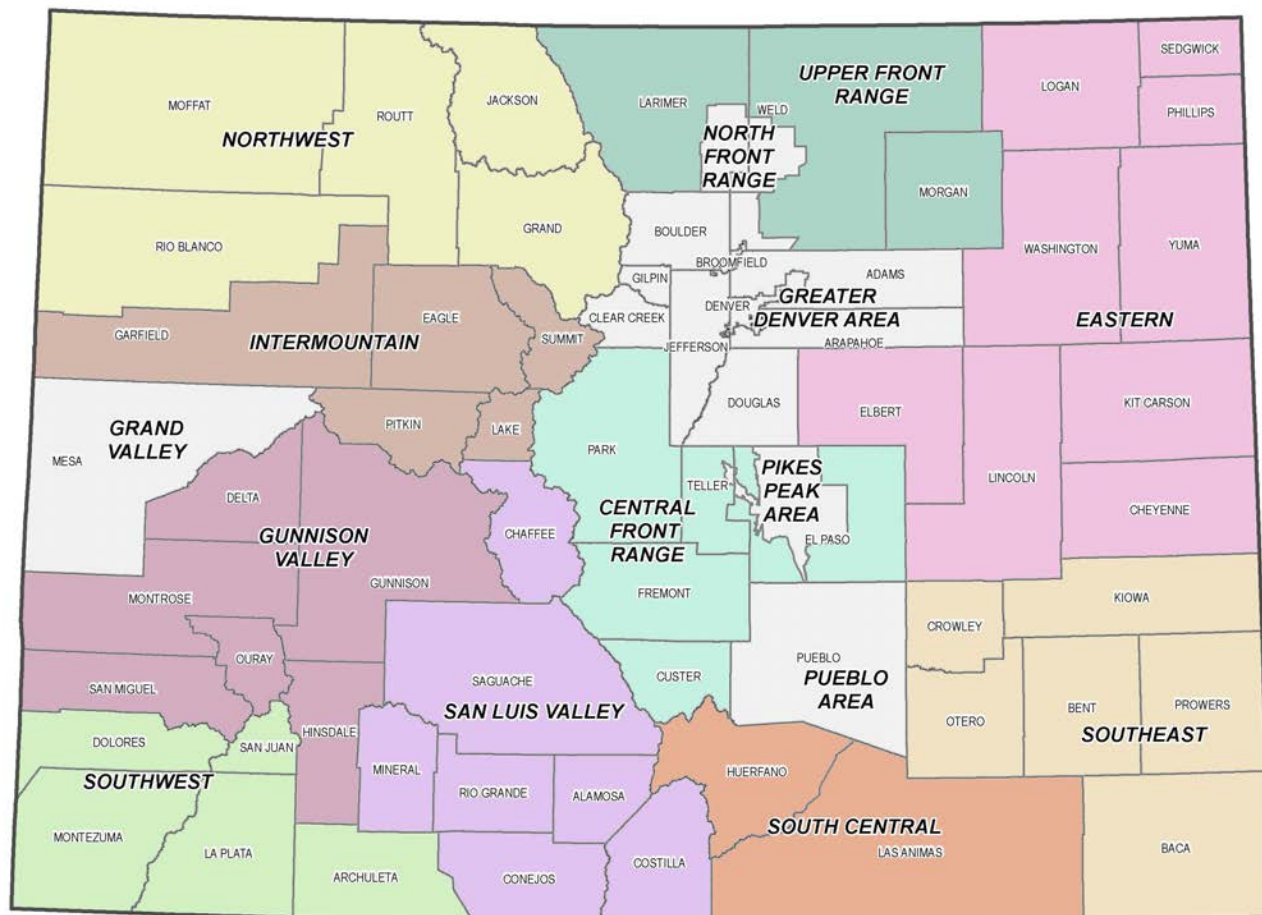


Figure 4: Colorado TPRs and MPOs



## CONSISTENT REGIONAL THEMES

Consistent freight-related themes which came from MPO and TPR Telephone Town Halls and TPR meetings included:

- More work is needed at the regional level to identify freight bottlenecks, factors hindering freight movement, and the importance of Freight Corridors to the entire state
- Multi-state Freight Corridors are important to the state and regional economies and should be prioritized for improvements
- Reliability of freight movement enables many regional businesses to compete in global markets
- Many planned highway improvements will benefit the movement of truck freight
- Air is vital to regional businesses to bring in shipments of important goods and enable client and employee travel
- TPRs and MPOs could facilitate the creation of more or improved freight intermodal transfer points (train/truck, truck/train, and truck/plane)
- Truck freight is very sensitive to consumer demand and economic activities
- Mitigation of impacts of freight movement on communities and highways is needed, particularly because freight movement is increasing and trucks are getting larger, and hauling heavier loads

## CONSISTENT STATEWIDE THEMES

Through these statewide planning outreach efforts, CDOT received public feedback on all aspects of transportation in Colorado. Much of this stakeholder input related, directly or indirectly, to the topic of freight. Some of the most common themes included:

- Coloradans see a clear connection between the transportation system and the economic vitality of their area and the state
- Freight movement was a common concern among participants in Telephone Town Halls and public surveys statewide
- A majority of public survey respondents consider “the safe movement of people and goods” as the most important goal of the transportation system
- Reducing congestion was an important priority highlighted by public surveys
- Coloradans’ top priorities in light of limited funding are maintaining the existing transportation system and improving highway pavement condition

## PURPOSE OF KEY STAKEHOLDER INPUT

The FAC provided input related specifically to freight industry issues. In addition, multiple public outreach activities occurred during the development of the 2040 Statewide Transportation Plan , and the 10 rural Regional Transportation Plans. These activities included collecting public sentiment on freight-related issues. Stakeholders provided input on:

- Regional Priority Corridors
- Statewide Priority Corridors
- Freight Vision, Goals, and Objectives
- Identification of Freight Corridors
- Identification of Potential Freight Project Areas
- Freight Implementation Strategies

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# CHAPTER V: COLORADO STATE HIGHWAY FREIGHT SYSTEM

## CHAPTER V KEY POINTS

- Four Federally Designated High Priority Corridors are: the Heartland Expressway from Denver/Limon to Rapid City, SD; Ports to Plains from Laredo, TX to Denver, CO; Camino Real from EL Paso, TX to the Canadian border; and the High Plains from Newton, KS to Pueblo, CO.
- The heaviest amount of truck vehicle miles traveled occurs on the interstates, I-25, I-70, and I-76.
- Sideswipes are the most frequent type of crashes for trucks.
- Colorado's top commodities are: by tonnage, gravel/sand, broken stone or riprap, and ready-mix concrete; by value, field crops, petroleum refining products, and missile or space vehicle parts.
- Trucks represent the highest mode share for moving freight for both imports and exports.

This chapter presents Colorado freight data collected and analyzed during Phase I of the freight planning process for the State Highway Freight Plan. Information described includes: Freight Corridor identification and infrastructure, infrastructure condition, system performance, regional differences, safety, and freight facilities that enhance safety and mobility.

## FREIGHT CORRIDOR IDENTIFICATION

Freight Corridors were identified based on several factors described below including input from the freight industry and other stakeholders.

### IDENTIFICATION OF POTENTIAL CORRIDORS

The following factors were used to identify potential candidates for further analysis and consideration as Freight Corridors.

- **Federally Designated High Priority Corridors:** Federally Designated High Priority Corridors were identified as part of the ISTEA in 1991 to promote collaborative planning along corridors. All Federally Designated High Priority Corridors were included on the Freight Corridor System. See Figure 5: Federally Designated High Priority Corridors. See Appendix B for information on studies completed on Federally Designated High Priority Corridors.
- **Interstate Highways:** All interstate highways were included on the Freight Corridor System. Because of the order of magnitude of freight movement carried along the interstates, these routes were not analyzed along with the other potential routes.
- **National Highway System (NHS):** All on-system NHS system facilities were considered. See Figure 6: NHS Facilities in Colorado.
- **Expressways and Principal Arterials:** Expressways in urbanized areas and principal arterials in rural areas were considered, as these classifications of roadway typically serve through traffic rather than local traffic.
- **Hazardous Materials Routes:** Hazardous materials routes were considered as they have been designated as routes to be used by a subset of commercial vehicles. See Figure 7: Hazardous Materials Routes in Colorado
- **Other On-System Routes:** Additional on-system routes were considered for connectivity to adjacent regions.

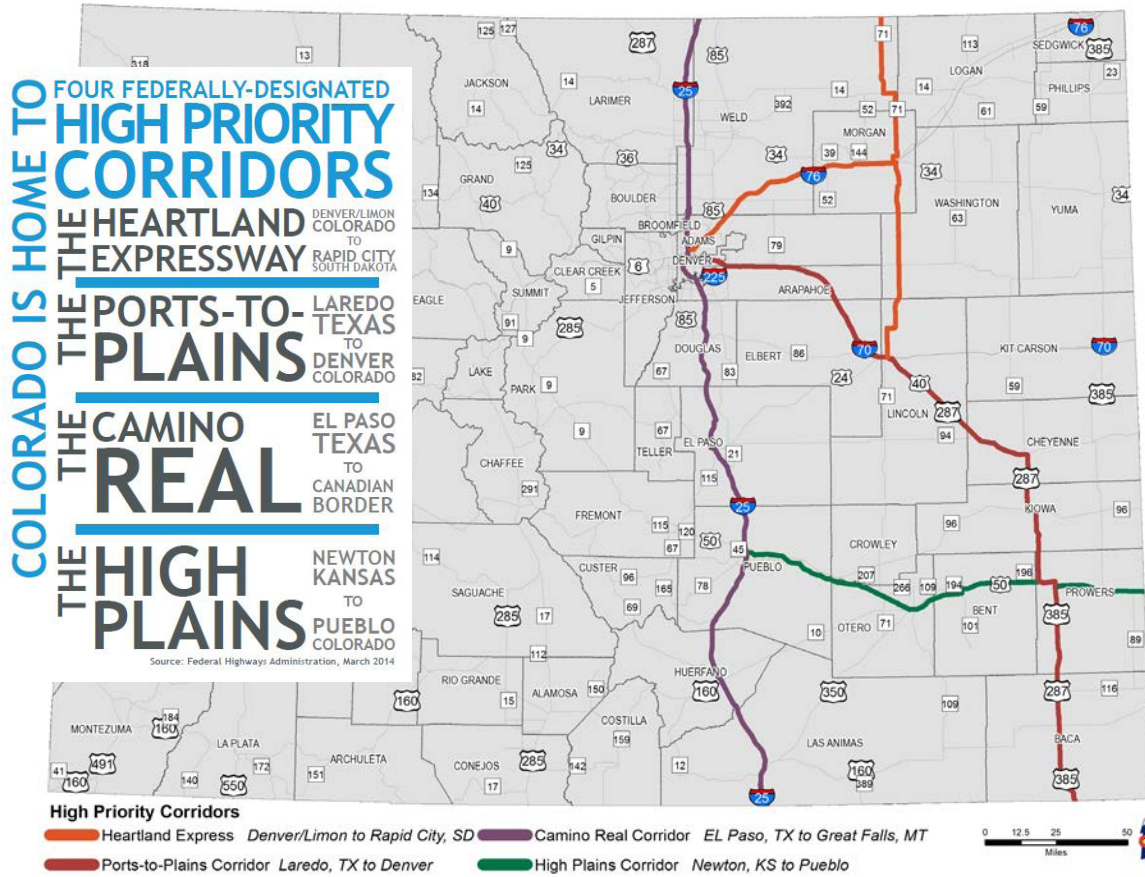


Figure 5: Federally Designated High Priority Corridors

Source: CDOT, 2014

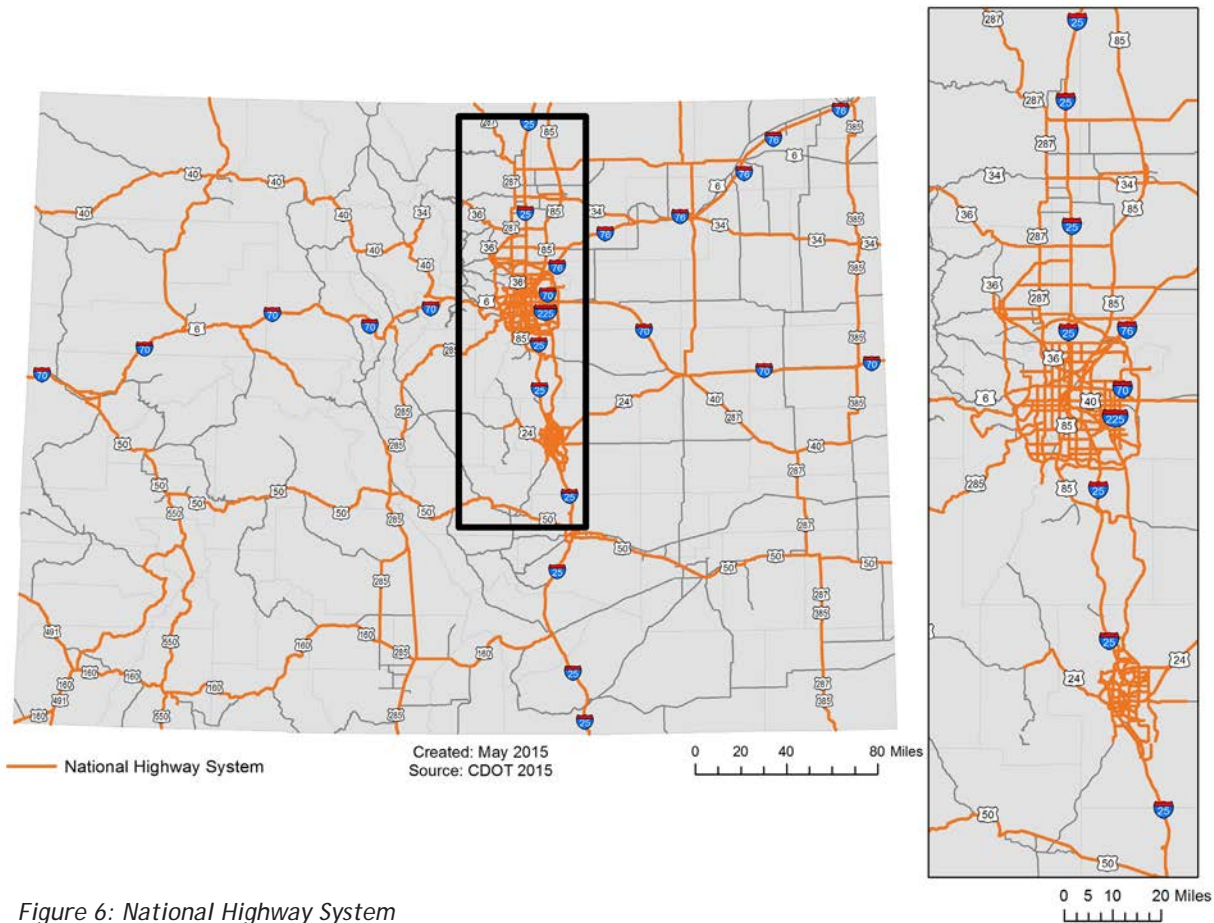


Figure 6: National Highway System

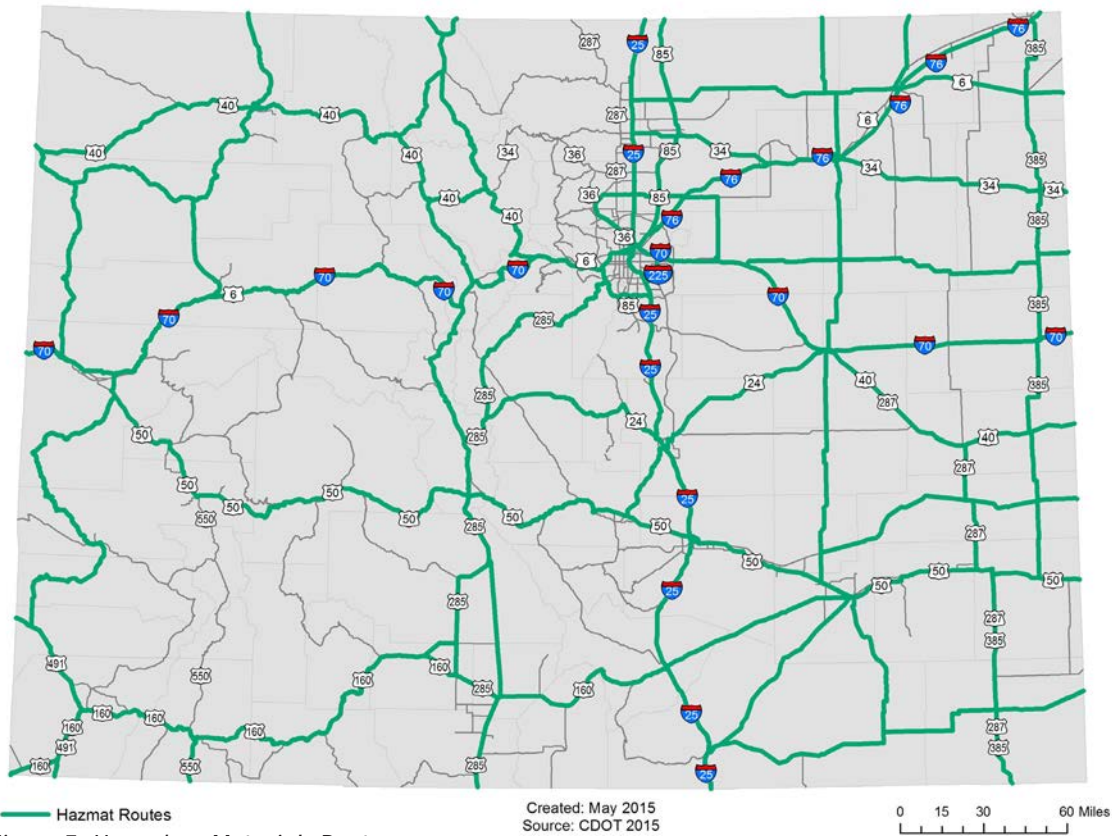


Figure 7: Hazardous Materials Routes

## ANALYSIS OF POTENTIAL CORRIDORS

Potential corridors were further analyzed on the basis of:

- Annual Average Daily truck Traffic (AADTT)
- Percent of truck traffic (Off-Peak) compared to all vehicles
- Throughput across regional boundaries.
- Connectivity
- Continuity

Truck traffic is measured as Annual Average Daily Truck Traffic (AADTT or Truck AADT). Truck AADT represents the average daily number of trucks on a given segment of roadway, calculated over a one year period. Figures 8 and 9 show levels of truck AADT and percent of truck traffic across Colorado. Figure 8 illustrates that the interstates, I-70, I-25 and I-76, are the highway corridors where the heaviest amount of truck travel occurs in Colorado.

In terms of truck percent of traffic, Figure 9 shows that areas with the highest percentage of truck traffic are found in the eastern portion of Colorado, in western Colorado, and in the south central portion of the state.

Within geographic areas (TRPs, MPOs, and CDOT Regions), routes were compared to each other (excluding interstates) using AADTT and percent truck traffic (for off-peak hours). Those routes with significantly higher numbers in either category were considered for further analysis, which included examining those routes for throughput across regional boundaries, connectivity, and continuity.

After the Freight Corridors were identified, CDOT identified characteristics and attributes of the Freight Corridors, and how Freight Corridor needs compared to the State Highway System in terms of condition, performance/congestion, and safety.

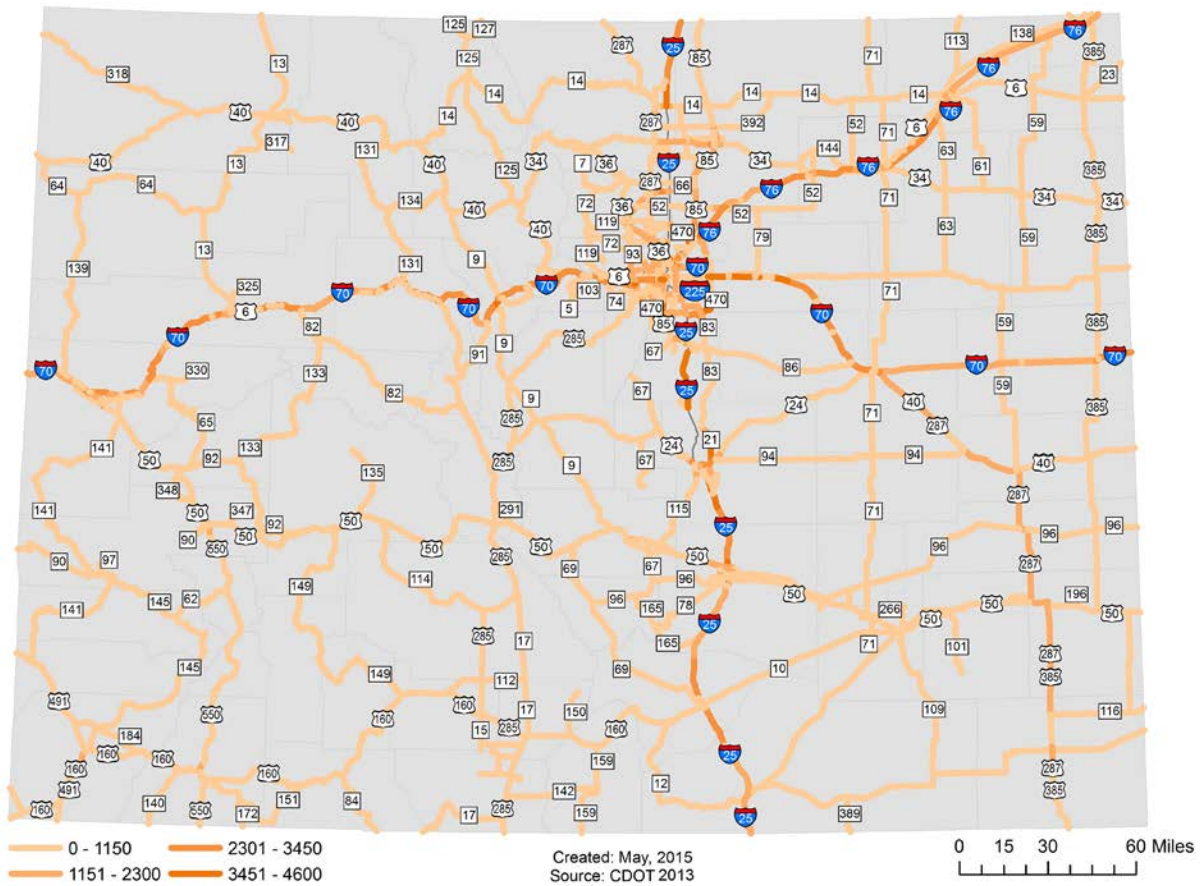


Figure 8: Colorado Truck AADT

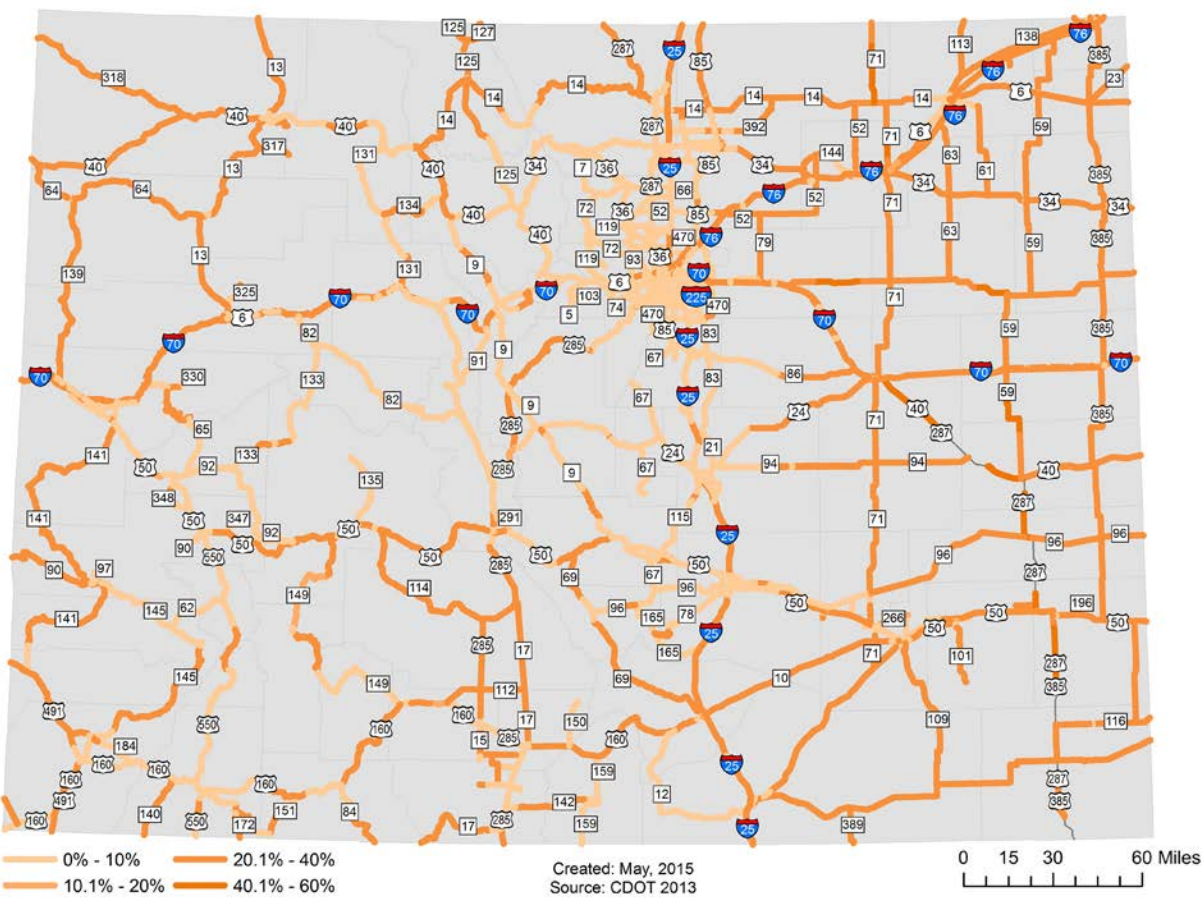


Figure 9: Off Peak Percent of Truck Traffic

## STAKEHOLDER INPUT

In addition, three significant modifications were made to the Freight Corridor System based on freight industry and regional input.

- US 34 from US 40 (Granby) to US 36 (Estes Park) was removed because it traverses Rocky Mountain National Park and is not generally used for freight movement.
- SH 10 was added to improve connectivity between the San Luis Valley and the Eastern Plains.
- SH 145/SH62 was removed and replaced with SH 141 on the basis of SH 141 providing a more direct north and south route on the western edge of the state, and SH 145's rougher terrain, and proximity to US 550 (east of SH 145).

The corridors identified through the process described above appear in Figure 10: Colorado Freight Corridors.

## FREIGHT CORRIDOR INFRASTRUCTURE

The Freight Corridors as depicted in Figure 10 include:

- 4,156 centerline miles; 12,116 total lane miles;
- Interstate highways (I-25, I-70, and I-76);
- 87% of on-system NHS roadways; and
- Approximately 2,200 Bridges.

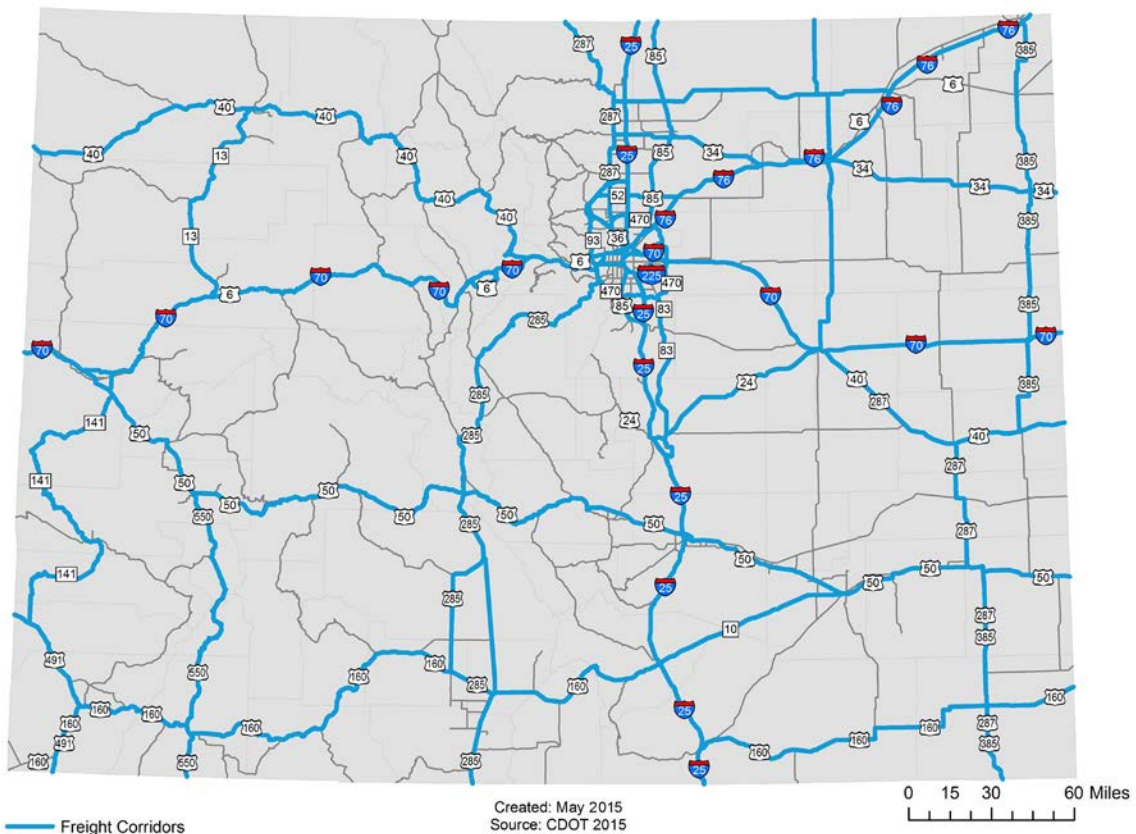


Figure 10: Colorado Freight Corridors

# INFRASTRUCTURE CONDITION

## PAVEMENT

The pavement condition of a highway has important impacts on the speed, comfort, and safety of the driver and their cargo. Drivability Life is a new method developed by CDOT to assess pavement condition and prioritize statewide treatments in light of limited funding. The Drivability Life system promotes more frequent surface treatment than its predecessor and results in the optimization of pavement investment. Under Drivability Life, prioritized roads will receive more minor treatments more frequently, and the entire system will receive more frequent treatment. This new method is anticipated to increase the number of treated highway miles by 64% between fiscal year (FY) 2012 and FY 2017. Pavement is designated as high, moderate or low condition based on how long in years before treatment is needed. Roadways rated with high Drivability Life should not require treatment for at least ten years. Roadways rated as moderate need treatment in 4-10 years, and low rated roadways in 3 years or less. As presented in Figure 11, approximately 84% of the Freight Corridors have high or moderate Drivability Life ratings, while 82% of all state highways have high to moderate ratings.

Maintaining good pavement condition on Freight Corridors is critical to ensuring the safe and efficient movement of freight across the state. Freight Corridors, with a higher percentage of heavy truck traffic, require more frequent maintenance to keep up the same level of pavement condition on other roads with less heavy truck traffic. Trucks cause a higher degree of wear and tear on pavement due to the substantial size and weight difference compared to other vehicles.

In terms of low Drivability Life ratings, 16.3% of Freight Corridors are considered low compared to 18% statewide.

The ongoing maintenance of key Colorado Freight Corridor assets will be critical for the continued viability of the state's freight economy. CDOT has identified several strategies related to maintaining the state's freight transportation system, which are described in detail in Chapter VII and Chapter VII.

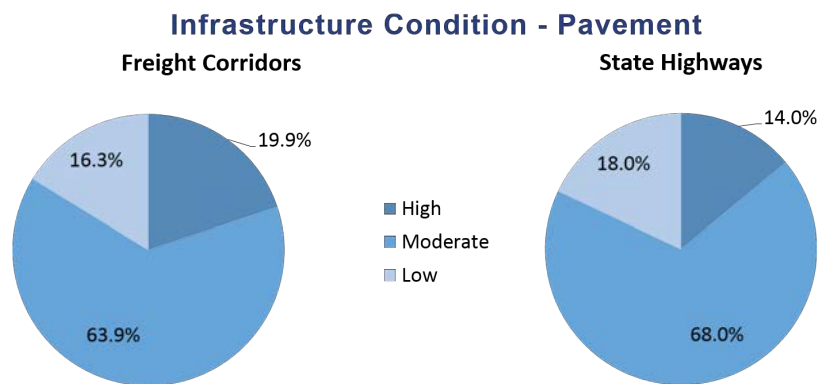


Figure 11: Infrastructure Condition - Pavement

Source: CDOT, 2013.

## BRIDGES

Bridges are an integral part of the statewide transportation system and their condition must be monitored to ensure continued safety and functionality. The State Highway System includes over 3,400 bridges, approximately 2,200 of which are located on Colorado Freight Corridors. Currently, 97.6% of bridges on the State Highway System are rated in good or fair condition, and about the same level, 97.4%, are rated good or fair on all of Colorado's state highways, as shown in Figure 12.

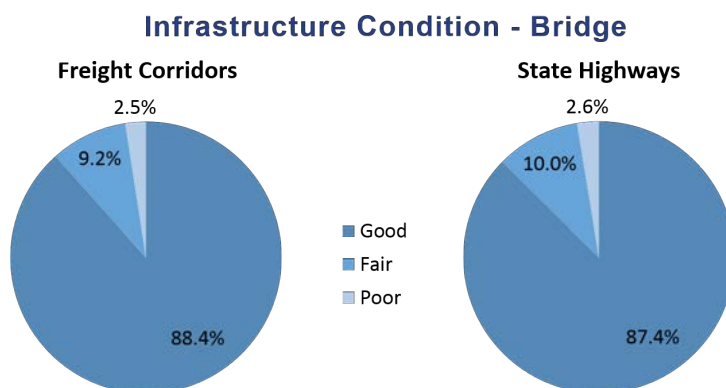


Figure 12: Infrastructure Condition - Bridge

Source: CDOT, 2014.

# SYSTEM PERFORMANCE

Highway congestion can be a major barrier to the smooth movement of traffic, particularly in urban centers with large populations. As the state’s population continues to outpace highway capacity in the decades ahead, the problem of congestion may worsen significantly if strategies are not employed to counteract the trend.

Trucks currently travel approximately 6.7 million vehicle miles daily on the State Highway System, representing roughly 9% of all vehicle miles traveled (VMT) on the State Highway System.

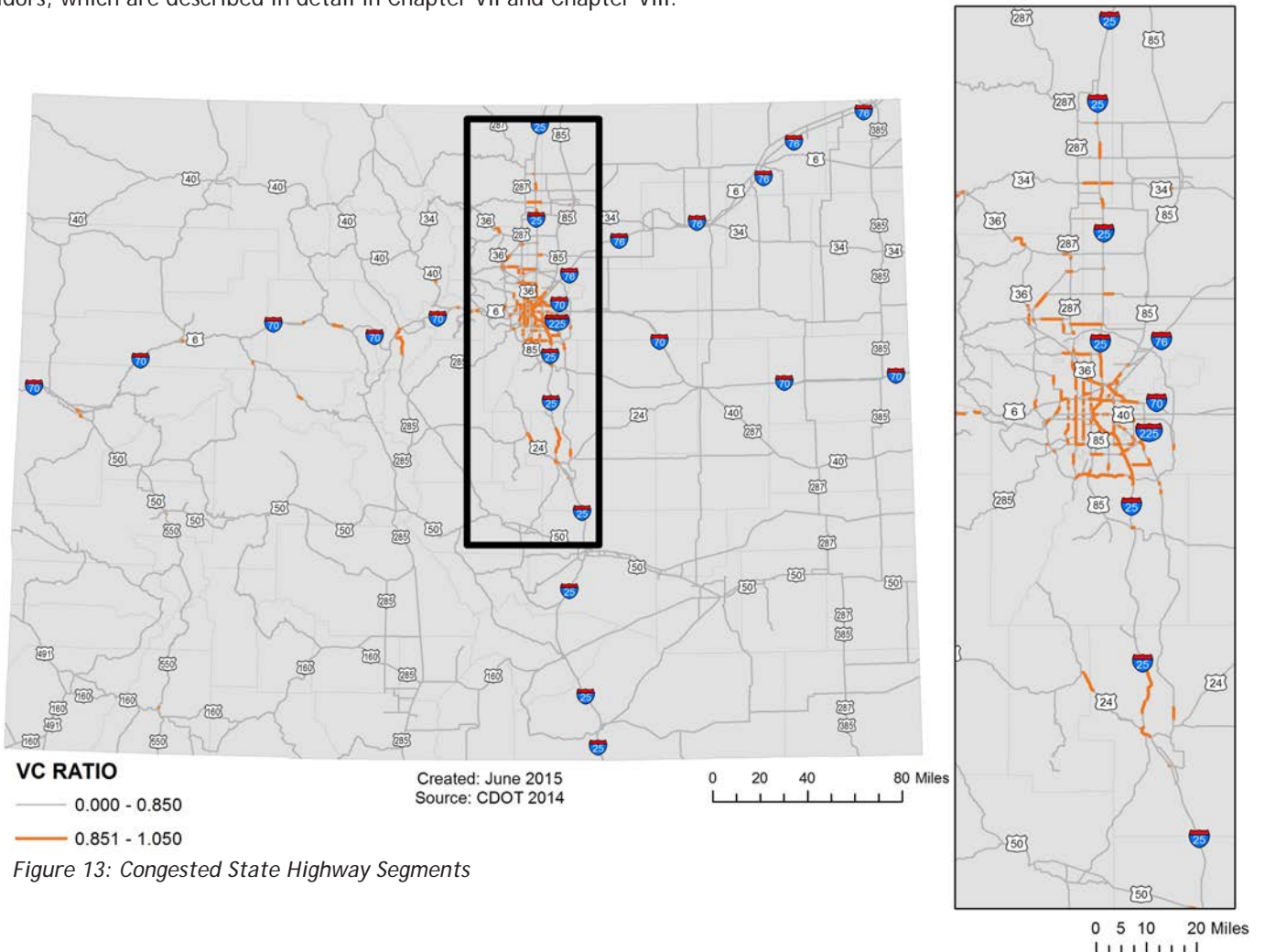
It is anticipated that by 2040 truck VMT will increase in response to changes in population and land use, and commodity movement. The volume of freight movement in tons in Colorado is projected to increase by 74% between 2010 and 2040. Total VMT is projected to increase by approximately 47% by 2040.

## CURRENT AND FUTURE CONGESTION

Highway congestion is defined as corridors having a volume to capacity ratio (V/C) of greater than 0.85. Figure 13 represents congested segments of state highways in Colorado. Freight Corridors represent 4,156 centerline miles of the state’s transportation system with roughly 4% or 166 centerline miles being congested. This is in comparison to 305 centerline miles, or roughly 3% of the State Highway System’s 9,104 centerline miles that are considered congested, as presented in Figure 14. ‘

Assuming that no significant additional roadway lane miles are added to the network within the next 10 years, CDOT’s trend analyses highlights that by 2025 the Freight Corridors are projected to have roughly 12% or 479 centerline miles being congested, compared to 8% or 687 centerline miles of congestion on the State Highway System. For 2040, the projections indicate 19% or 803 centerline miles of congestion on Freight Corridors, compared to roughly 12% or 1,133 centerline miles of congestion on the State Highway System. This correlates to percentage increases of three times between now and 2025, and almost five times by 2040, exacerbating existing freight mobility challenges.

CDOT has identified several improvements designed to mitigate the forecasted increase in congestion along the Colorado Freight Corridors, which are described in detail in Chapter VII and Chapter VIII.



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Figure 13: Congested State Highway Segments

## Congestion Comparison

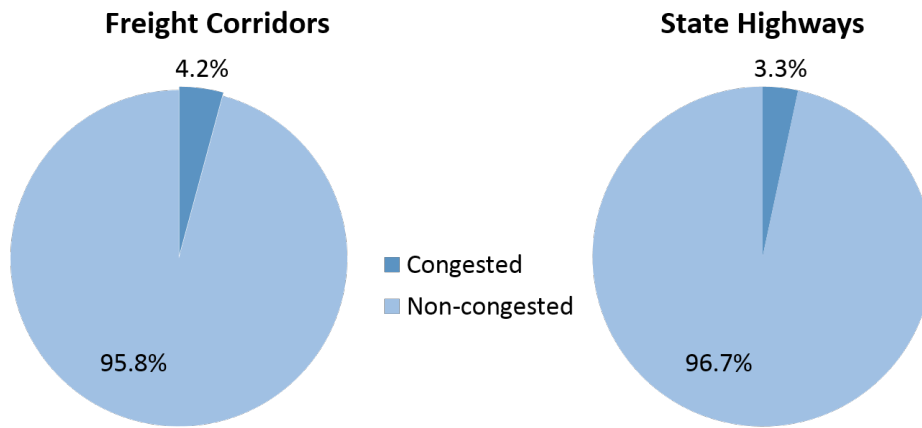


Figure 14: Percent of Congested Freight Corridors

Source: CDOT, 2013.

CDOT is currently in the process of considering a new metric for congestion, based on speed and travel time data.

## REGIONAL DIFFERENCES IN VMT AND CONGESTION

### SYSTEM PERFORMANCE

The characteristics of transportation system use in Colorado vary between rural and urban areas, and freight movement is no exception. As shown in Figure 15, there are important distinctions between Colorado's rural and urban areas related to population, lane miles of state highway, and vehicles miles traveled (VMT). While population and total VMT are more heavily weighted towards the urban areas, a significantly larger percentage of total roadway lane miles are located in the rural areas. As a result, congestion and travel delay issues tend to occur more frequently in urban areas than rural areas due to the combination of fewer lane miles and greater levels of travel demand.

One particular area of difference between rural and urban areas as it relates to freight is in terms of congestion. While traffic congestion and delay can occur on roadways of any size or geographic location, the causes vary significantly between urban and rural areas. Regardless of the cause, congestion negatively impacts freight movement, but knowing the roots of the problem in a given area is a necessary first step in devising strategies to mitigate or eliminate it. Figure 16 depicts where urban and rural roadways are located in Colorado.

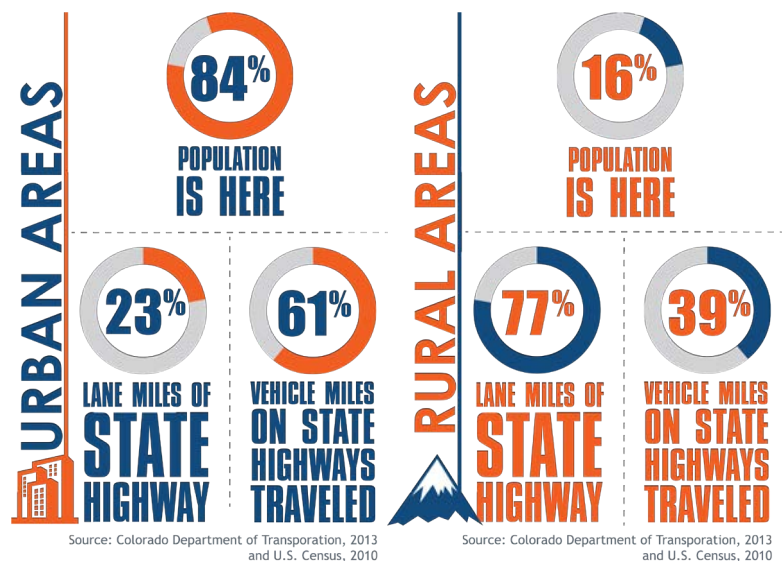


Figure 15: Urban and Rural Comparison

As indicated by Figure 17, the causes of roadway congestion can be classified as either recurring or non-recurring. Recurring causes are those, which are to a certain extent, predictable given the physical characteristics of the corridor, such as areas of insufficient capacity and signal timing. Non-recurring causes of congestion are less predictable and derived from non-design factors such as bad weather, special events, work zones, or crashes. While the negative effects of recurring and non-recurring congestion may be similar, the approaches required to resolve them are very different.

As Figure 17 shows, urban areas experience an approximately balanced split between recurring and non-recurring congestion nationally, largely due to the higher traffic volumes that they experience. Rural areas, on the other hand, see very little recurring congestion given lower traffic volumes except only at specific times or seasons based on recreational traffic. For the purposes of freight planning it is important to recognize the potential times and locations at which recurring congestion is likely to occur and may potentially be avoided, as well as develop strategies for dealing with more unpredictable non-recurring congestion in both rural and urban areas.



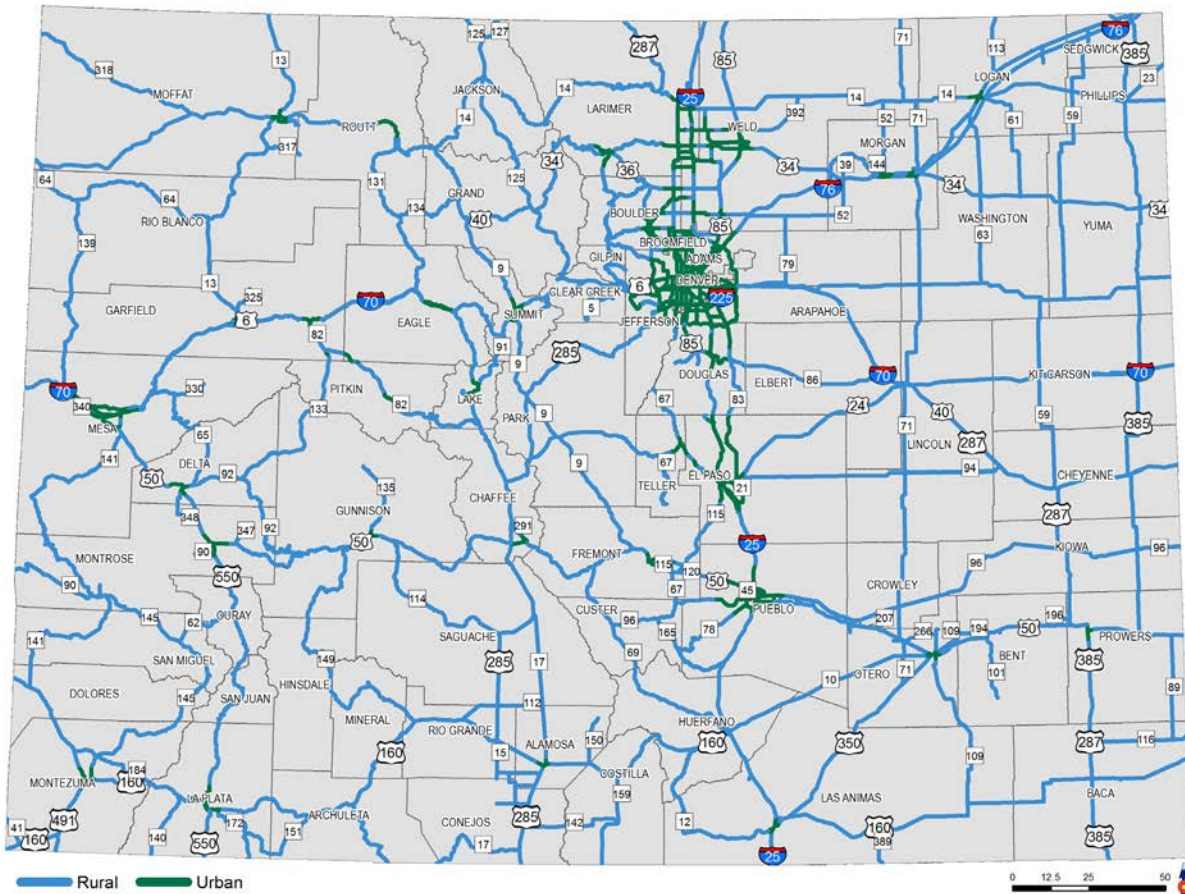


Figure 16: Urban and Rural Roadways in Colorado

Source: CDOT, 2013

## SAFETY

Safety is CDOT's top priority, and in recent decades Colorado has made substantial progress in reducing deaths and injuries on the State Highway System. Within the last 15 years, the total number of fatalities occurring on the entire statewide transportation system fell from 742 in 2002 to 472 in 2012, as shown in Figure 18. This decline occurred during a period in which the total number of vehicle miles traveled was increasing statewide.

In the recently completed Strategic Highway Safety Plan (SHSP), CDOT adopted a statewide goal of Moving Towards Zero Deaths. CDOT believes that the goal of zero traffic deaths is both realistic and attainable, particularly given the potential of new emerging technologies, ongoing educational campaigns, and targeted safety investments to dramatically improve roadway safety in the future. In order for this goal to become a reality, it will be necessary to coordinate efforts along all state highways, including the Colorado Freight Corridors.

While freight vehicles travel on the same roads as the general traveling public, the safety issues they confront are often different. In order to better understand safety on Colorado Freight Corridors, an analysis was completed to compare truck crash rates on Colorado Freight Corridors with total crash rates. Crash data of Freight Corridor segments was analyzed to compare crash rates (crashes per million vehicle miles traveled) of trucks to crash rates for all vehicle types for years 2008-2012.

## CAUSES OF CONGESTION

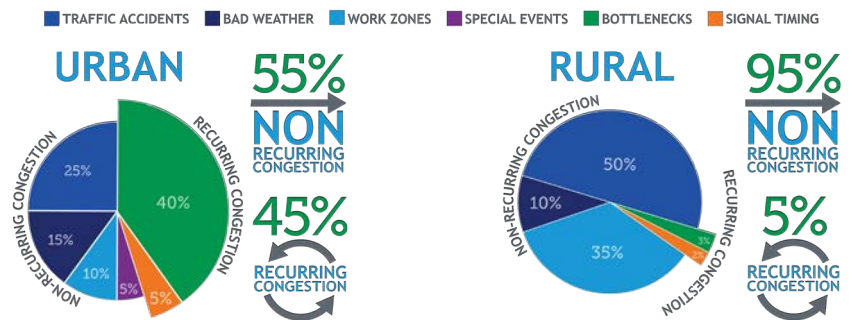


Figure 17: Causes of Congestion

Source: Colorado Department of Transportation, 2014

## Fatality and Serious Injury Decline 2002-2012

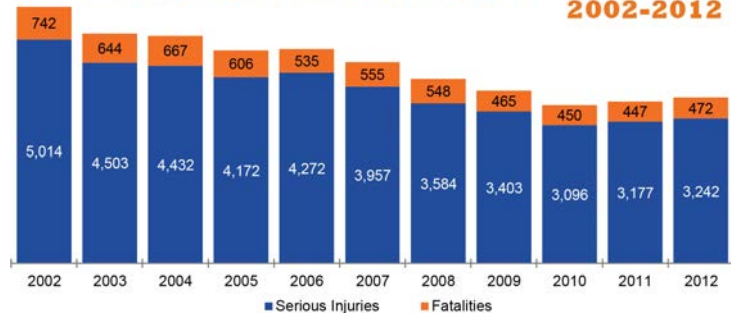


Figure 18: Fatality and Serious Injury Decline

Source: Colorado Department of Transportation, May 2014

The percent difference was calculated between the truck crash rate and the general crash rate. A negative percent difference that resulted from the analysis indicated that the truck crash rates were lower than the overall crash rate for a given Freight Corridor segment. The majority of these corridor segments' crash rates were negative numbers, indicating that truck crash rates are mostly lower than the overall crash rate for all vehicle types. This is likely due to the fact that truck drivers are generally well-trained professionals, who exhibit safe driving behavior. However, the analyses also identified certain segments of Freight Corridors where the truck crash rates were higher than the overall crash rate. CDOT will focus on these segments with relatively higher truck crash rates. CDOT is working to obtain additional data to assess the causes of these increased crash levels and determine potential mitigation strategies.

As with crash rates, freight vehicle crash types also differ from those of the general traveling public in Colorado. As Figure 19 indicates, trucks have twice the rate of involvement in sideswipe crashes as the total vehicle population, a rate of 21.5% as compared to 11.2%. They likewise show a greater chance of overturning, albeit with a smaller difference of 8.6% versus 5.4% for all vehicles. Overall, sideswipe and rear end crashes account for a combined 43% of truck crash types, indicating that these may be the key areas to focus on with various educational safety campaigns related to driver awareness.

As in the case of crash rates, additional data collection and analysis will be needed in order to devise proper strategies for improving safety performance in this area.

CDOT has identified a variety of strategies designed to improve the safety of freight transport in Colorado, which are described in Chapter VII and Chapter VIII.

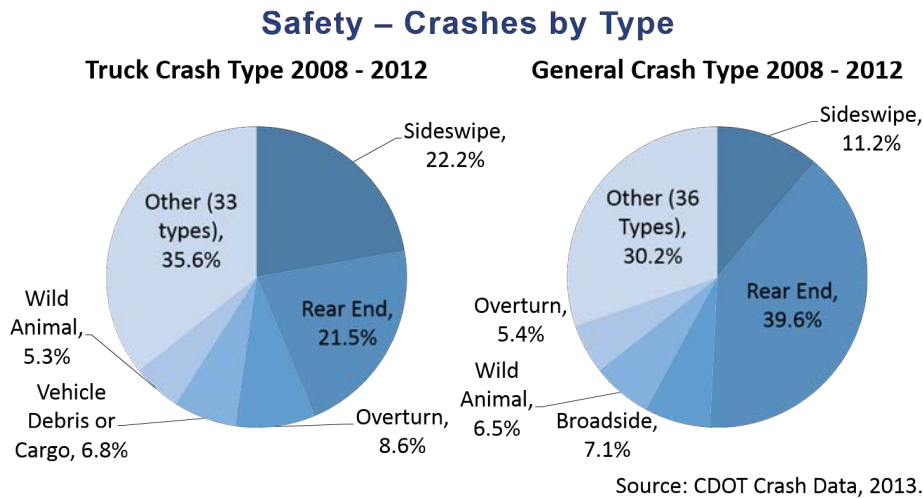
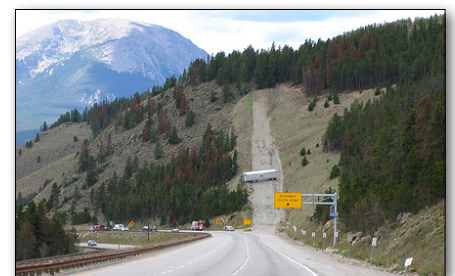


Figure 19: Crash Type Percentages, 2008-2012

## OTHER FACILITIES

Other facilities that support the movement of freight on the State Highway System include:

- Runaway Truck Ramps - Steep gravel ramps built along a highways of steep grade (over 6%) that provide refuge for trucks with insufficient downhill braking capacity.
- Chain Up Areas - Staging areas built along highways prone to snowy and icy conditions, for large trucks and other vehicles to temporarily stop (usually no more than 30 minutes) to install tire chains safely during inclement weather.
- Weigh Stations Located at Ports of Entry (these facilities are managed and owned by the Colorado State Patrol, for more information on these facilities see: <http://www.coopsareopen.com/colorado-weigh-stations.html>).
- Truck Parking Facilities
- Rest Areas



Runaway Truck Ramp

See Figure 20: Other Freight Supporting Facilities for the location of runaway truck ramps, chain up areas, and weigh stations in Colorado.

See Figure 21: Truck Parking Needs from the 2007 truck Parking Issues Study. Since that time a new *Truck Parking Guide: Long-Term Parking – Emerging Parking – Chain Stations* was produced in April 2012 that covers facilities along all Colorado interstates, I-70, I-25, and I-76.

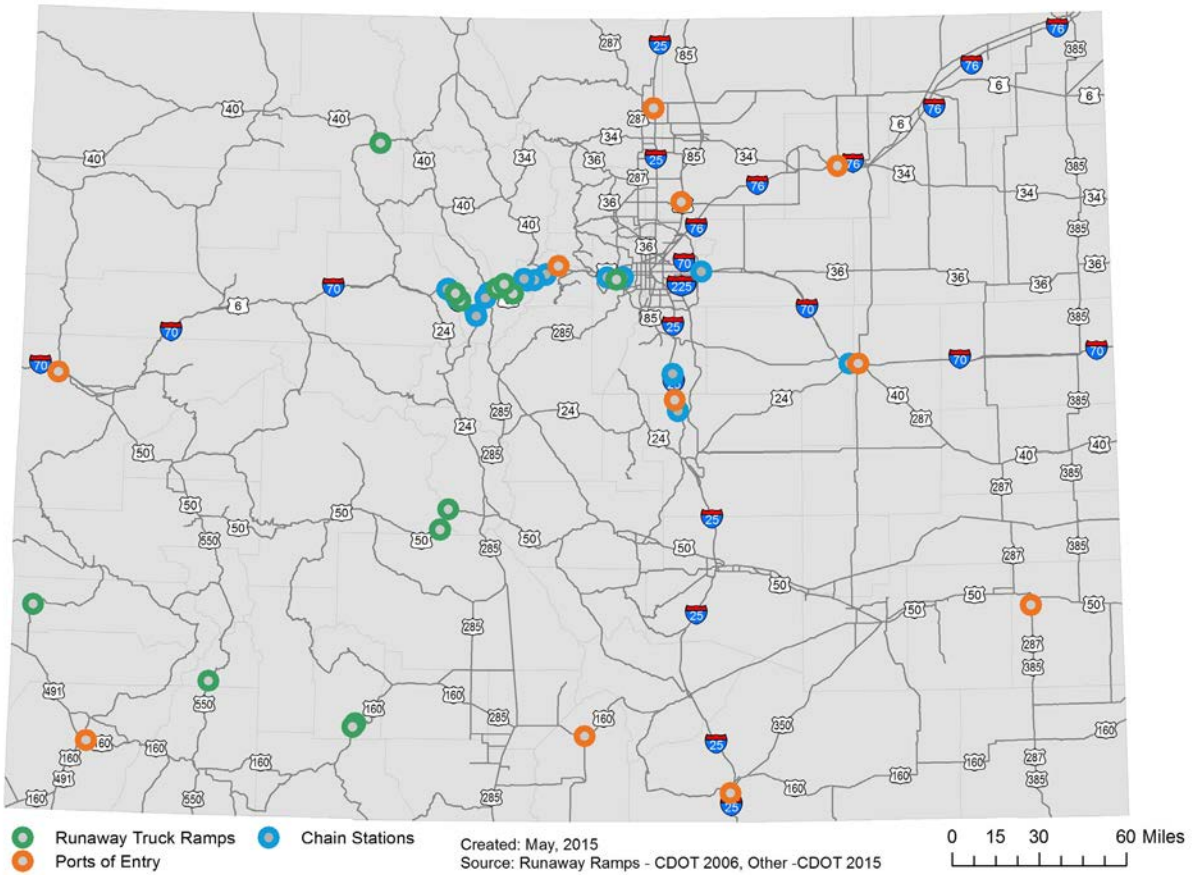


Figure 20: Other Freight Supporting Facilities

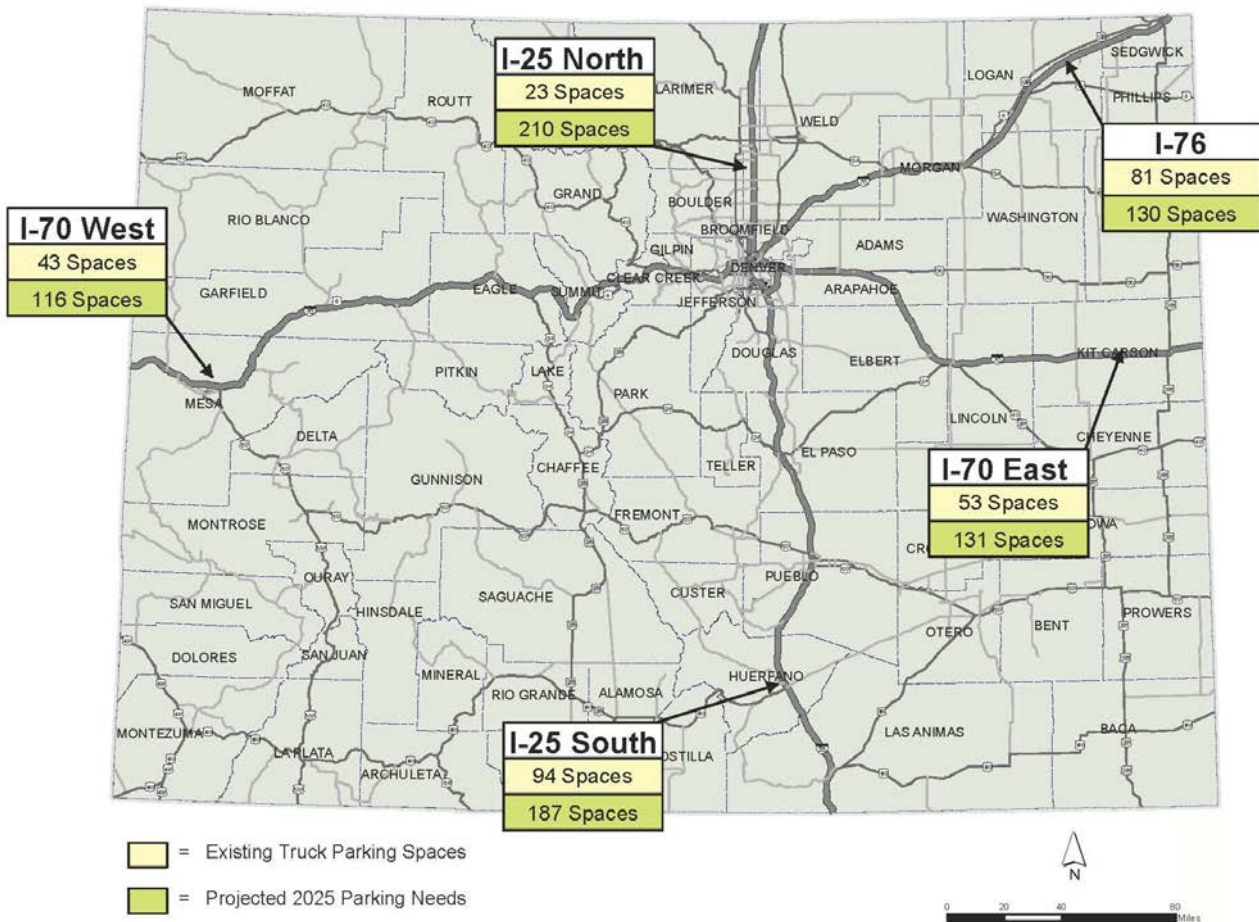


Figure 21: Truck Parking Needs

See Figure 22: Colorado Rest Areas for the location of rest areas in Colorado.

In addition, CDOT oversees permitting for oversized/overweight vehicles. CDOT recently conducted a LEAN process improvement for these permits. The oversized/overweight permitting process is now approximately 30% faster and 60% more accurate than it was previously (Source: CDOT 2014). This permitting process helps to ensure that oversized and overweight vehicles follow safety procedures, and that their travel routes can accommodate their size and weight.

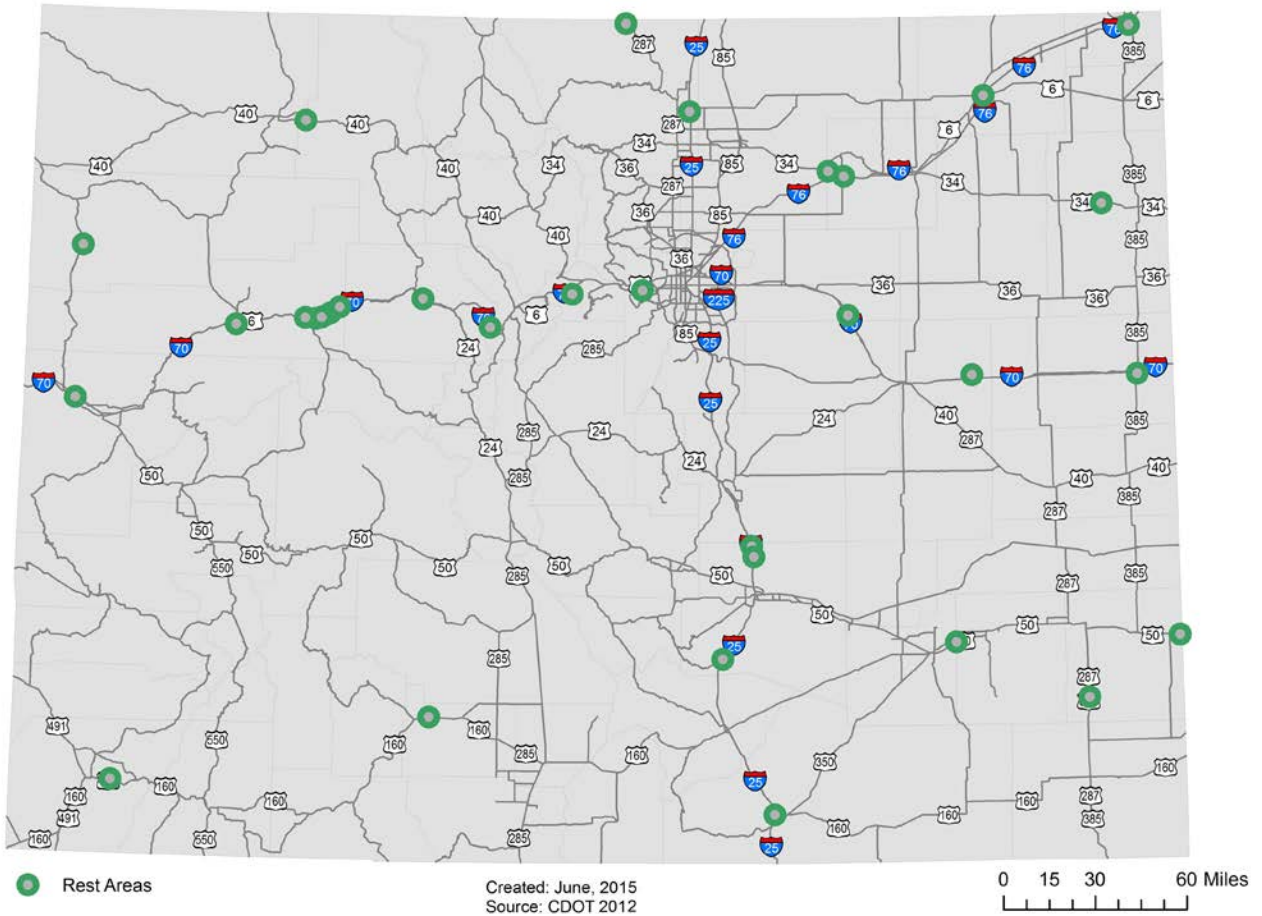


Figure 22: Colorado Rest Areas

# CHAPTER VI: THE ECONOMY AND THE FREIGHT INDUSTRY

## CHAPTER VI KEY POINTS

- Freight issues that are linked to the economy include congestion that increases costs and disrupts supply chains, and last mile of delivery connections.
- Key freight industries in Colorado based on top commodities include: construction, retail products, agriculture, aerospace, and oil and gas.
- The location of Colorado's lead trading partners by value and tonnage for exports and imports indicates the importance of I-25, I-70, I-76 and US 287 to the movement of freight.
- CDOT is taking steps to monitor and address emerging challenges and trends that impact freight movement.

Colorado's economy is heavily dependent on freight. Freight movement and the Colorado Freight Corridor System support the state's economy by:

- Allowing Colorado manufacturers to bring in raw materials and parts (for manufacturing) and transport products to and from other parts of the State and around the world.
- Allowing farmers and agricultural producers to get products to market and bring feed, seed, and equipment to their farms.
- Ensuring that the goods Colorado residents and employees need are available in local stores or can be delivered to their homes or place of work.

As the importance of trade and the demands of customers continue to evolve, Colorado companies often find freight to be an increasingly important factor in sustaining and enhancing their competitive position in the marketplace. They need reliable connections to customers and links to a multitude of markets to ensure timely deliveries of goods and services.

## KEY FREIGHT ISSUES RELATED TO THE ECONOMY

Key industry issues related to freight movement on the State Highway System include:

### CONGESTION

- Congestion can cause lost hours by drivers and equipment being stuck in congestion, this includes costs for hourly wages, wasted fuel, and idle equipment. These costs are then passed onto consumers.
- Congestion also disrupts industry supply chains and production schedules. Some industries measure in minutes the downtime costs due to lack of products and inputs - time matters
- Congestion creates costs due to lack of system reliability, which is the ability of shippers to accurately predict the length of time to ship and receive goods and inputs. All freight modes including trucks have reliability issues related to congestion. As a result additional inventory must be stored to address potential shortages and shippers must account for extra time in planning production and delivery schedules.

### LAST MILE CONNECTIONS

Often, the last mile of delivery of a product or service takes place on the local roadway network, normally maintained by cities, and counties. If these local connections aren't efficient due to lack of capacity, traffic conflicts, poor intersections, safety issues, or poor maintenance, then the last mile of a delivery will be delayed or fail to occur. Cities and counties play an important role in the movement of freight, by maintaining the condition and operation of the local transportation networks for the last mile. These local issues will be an area of focus during development of the Integrated Freight Plan, Phase II of the freight planning process.

# KEY FREIGHT INDUSTRIES

The key industries related to freight movement in Colorado include:

- Construction (Gravel, Sand, Broken Stone, Rip Rap, Ready Mix Concrete)
- Retail products industry (passing through Warehouse and Distribution Centers)
- Agriculture (Miscellaneous Field Crops)
- Aerospace (Missile or Space Vehicle Parts)
- Oil and Gas (Petroleum Refining Products)

## CONSTRUCTION

All roads in Colorado potentially lead to areas where construction occurs. Trips for these heavier commodities are usually shorter in trip length and more local in nature.

## RETAIL PRODUCTS THAT PASS THROUGH WAREHOUSE DISTRIBUTION CENTERS

Warehouse Distribution Centers in Colorado generally are located adjacent to interstates, highways, and/or intermodal facilities to capitalize on easy access for receiving and dispatching large shipments.

## AGRICULTURE

Agriculture is a key freight industry in Colorado. According to the Office of Economic Development and International Trade (OEDIT), Colorado's agriculture industry generates more than \$5 billion in economic output annually, and in 2011 Colorado agricultural exports grew by 20% to \$718 million (Source: OEDIT, 2014).

IHS Global Insight reports that every Colorado county produced some sort of agricultural product in 2010, and is projected to continue to produce similar products into the future. Agricultural production is the highest on the Eastern Plains and in the San Luis Valley as indicated on Figure 23. During times of harvest potentially every road in areas of high agricultural production serves as a mover of freight.

## AEROSPACE

Colorado's aerospace industry ranks 2nd in the nation for private sector aerospace employment.

With four military commands: Air Force Space Command, Army Space Command, NORAD and USNORTHCOMM and three space-related Air Force bases, Colorado is a strategic location for the space industry. Many of the nation's major aerospace contractors base important operations in Colorado, including Ball Aerospace, Boeing, ITT Exelis, Lockheed Martin, Northrop Grumman, Raytheon, Sierra Nevada Corporation, and United Launch Alliance. Key locations in the state include: Colorado Springs, Littleton, Aurora, and the Boulder area. (Source: OEDIT, see: <http://www.advancecolorado.com/key-industries/aerospace>). Freight needs on the State Highway System for this industry vary greatly due to the diversity of supplies in terms of size and value.

## OIL AND GAS

As natural resource development continues throughout the state, Colorado is faced with increasing infrastructure demands and corresponding higher costs. Due to technological advancements and favorable economic conditions, onshore oil and gas development has significantly increased across the country over the past five years and Colorado is one of several states to experience dramatic increases in industry activity. With this economic growth has come increased pressure on highway

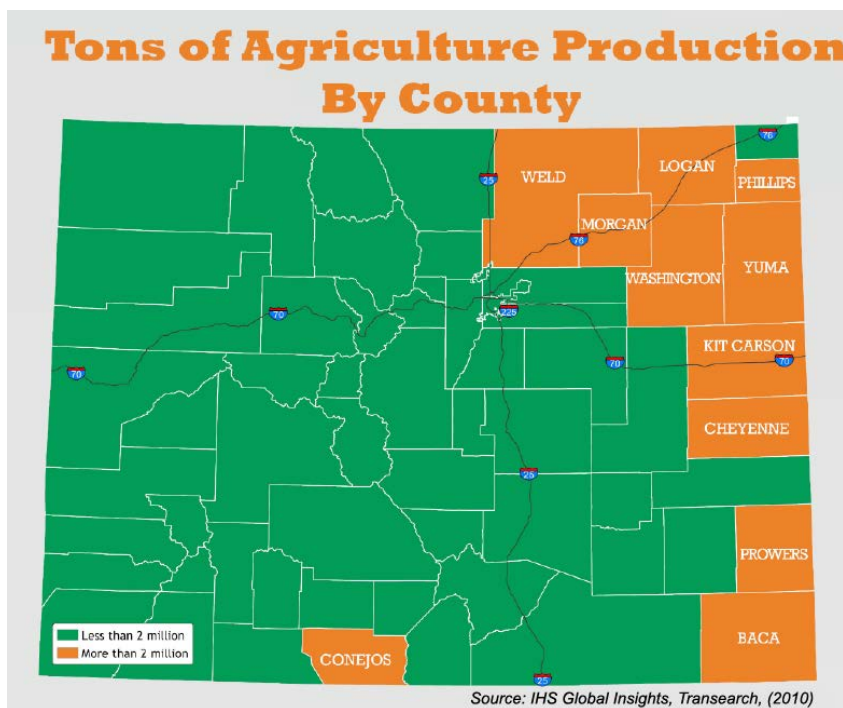


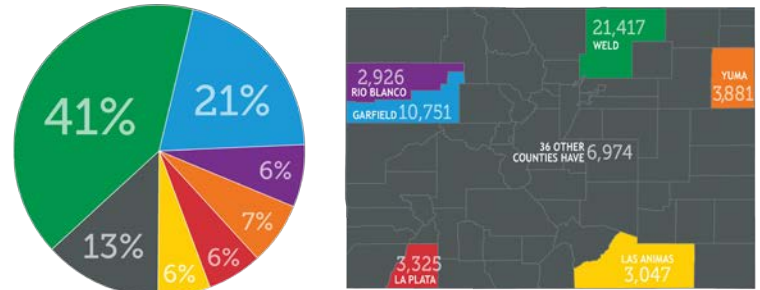
Figure 23: Tons of Agriculture Production by County

infrastructure in oil and gas development areas, that affects all transportation system users, including freight.

Recent oil and gas activity in Colorado depicted in Figure 24 has been primarily concentrated in the Denver-Julesburg and Piceance Basins. The Denver-Julesburg Basin is located beneath Weld, Broomfield, Adams, and Denver Counties, although the vast majority of the formation underlies Weld County. The Piceance Basin lies on the western edge of the state, primarily in Garfield County.

As of July 2014, Colorado has about 52,000 active wells. Over the past five years, Colorado's active well count has increased by approximately 26%. Oil and gas activity is heavily concentrated in Weld County, which has nearly 21,500 active wells or roughly 40% of all active wells within the state.

# OIL & GAS ACTIVE WELLS BY COUNTY



Source: Colorado Oil & Gas Conservation Commission, July 2014

Figure 24: Oil and Gas Active Wells By County

The number of oil and gas truck trips and the types of trucks used are factors in determining the order of magnitude of industry impacts on the State Highway System. Oil and gas development requires the transport of heavy equipment to the well site to build access roads, construct a well pad, and transport a drilling rig. Heavy trucks are also needed to bring fresh water to the well site and often to transport produced water and extracted resources off site. Based on producing oil and gas wells and well permits provided by the Colorado Oil and Gas Conservation Commission (COGCC), CDOT has identified key energy corridors, presented in Figure 25, that receive significant amounts of oil and gas related truck trips.

CDOT is in the process of investigating potential approaches to mitigating the increased wear and tear on highways associated with oil and gas development and plans to publish its findings and recommendations in the forthcoming Oil and Gas Impacts on Transportation study, to be completed in 2015.

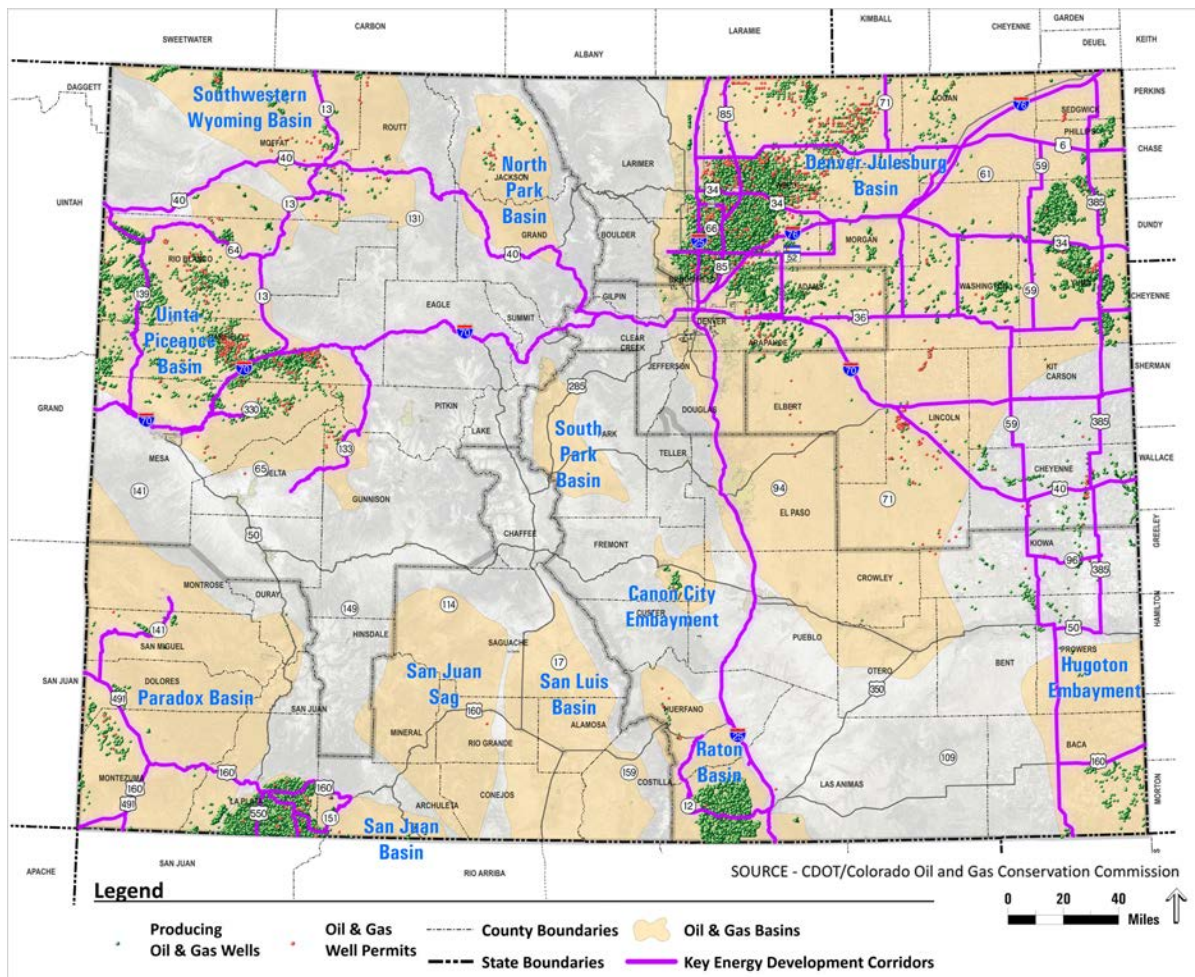


Figure 25: Colorado's Energy Corridors

# FREIGHT EXPORTS AND IMPORTS

Figures 26 and 27 below illustrate the percentage of freight (by weight) transported by truck, rail, air, and pipeline. Through trips (freight trips that pass through Colorado versus initiating or making final deliveries in Colorado) are not included. Regarding both exports and imports moving from and to Colorado, trucks represent, by a substantial degree, the largest freight transportation mode in Colorado.

The development of Integrated Freight Plan will include additional discussion on the other freight modes and how they integrate with Colorado's State Highway System.

## Freight Movement by Mode - Exports

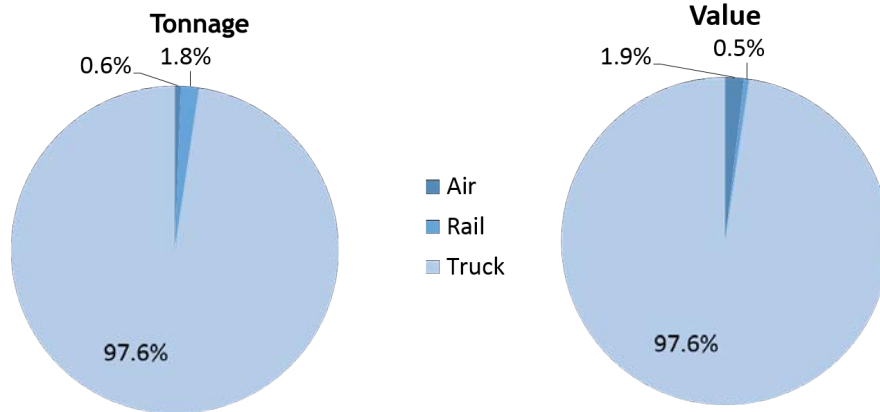


Figure 26: Freight Movement by Mode - Exports

Source: IHS Global Insight, 2010.

## Freight Movement by Mode - Imports

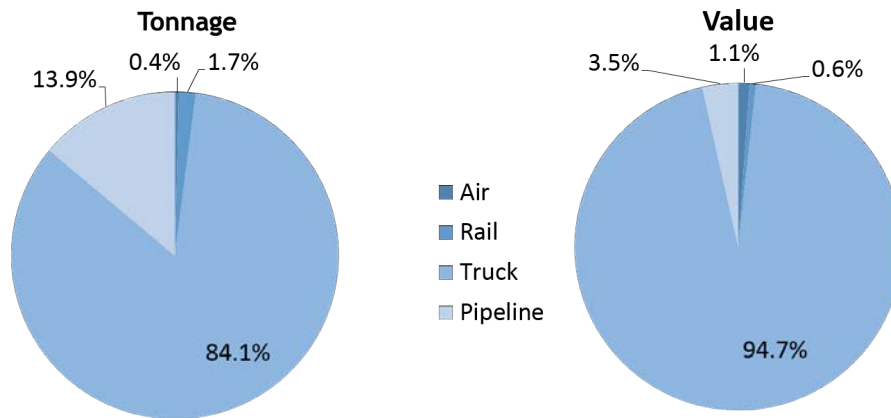


Figure 27: Freight Movement by Mode - Imports

Source: IHS Global Insight, 2010.

# TOP COMMODITIES IN COLORADO

Tables 3 and 4 present Colorado's top commodities categorized by Standard Transportation Commodity Code (STCC) and ranked by tonnage and value. A STCC does not represent any particular industry but rather a commodity. Several industries may use the same commodity; likewise a single industry may use several commodities. In compiling Tables 3 and 4 the top five commodities were initially selected for each of years 2010, 2025, and 2040. These tables show the results of this selection, and where these same commodities rank for the other years, including changes in tons and value.

Colorado's top commodities by tonnage, shown in Table 3, include gravel or sand, broken stone or riprap, and ready-mix concrete. These high weight/low value commodities are generally transported short distances and do not make up a large share of inter-regional movement. It is anticipated that these will remain the top commodities by tonnage in 2025 and 2040.



By value, the top commodities are field crops, petroleum refining products, and missile or space vehicle parts. By 2040, however, it is anticipated that these top three commodities will be supplanted by solid state semiconductors, drugs (medicine), and electronic data processing equipment. The percentage increase by weight, value, and unit between 2010, 2025, and 2040 for all Colorado highway freight movement are highlighted in Table 2. Increases by weight and unit are comparable, but by value the increase is more substantial, indicating Colorado is poised to produce higher value products.

Table 2: Percent Increase of All Freight Movement on Highways in Colorado from 2010 Baseline

MEASURE	2025	2040
<b>WEIGHT</b>	42%	74%
<b>VALUE</b>	70%	162%
<b>UNITS</b>	43%	75%

Source: Transearch 2010, IHS Global Insight

Tables 3 and 4 also depict three high value categories which are directly related to the logistics and transportation industries (shaded in gray). These categories represent a mixture of commodities which are combined, repurposed, or repackaged at a point along the supply chain. These mixed commodities include, but are not limited to, retail goods. As an example, products which enter a grocery distribution center, a dairy product and a cereal product, will be transported to the grocery store under the STCC “warehouse and distribution center”.

Table 3: Colorado’s Top Commodities Ranked by Tonnage

	2010		2025		2040	
	RANK	TONS	RANK	TONS	RANK	TONS
<b>GRAVEL OR SAND</b>	1	31,813,295	1	46,004,383	1	55,021,883
<b>BROKEN STONE OR RIPRAP</b>	2	22,243,359	2	33,758,537	2	40,083,957
<b>READY-MIX CONCRETE, WET</b>	3	12,763,536	3	22,278,068	3	26,909,522
<b>WAREHOUSE &amp; DISTRIBUTION CENTER*</b>		10,208,165		15,163,250		21,406,092
<b>MISC. FIELD CROPS</b>	4	9,979,941	4	10,534,427	6	10,285,700
<b>GRAIN</b>	5	7,682,931	5	9,215,708	4	10,682,437
<b>CONCRETE PRODUCTS</b>	7	4,685,274	6	8,340,373	5	10,505,382

Source: Transearch 2010, IHS Global Insight

Table 4: Colorado’s Top Commodities Ranked by Value

	2010		2025		2040	
	RANK	VALUE	RANK	VALUE	RANK	VALUE
<b>WAREHOUSE &amp; DISTRIBUTION CENTER*</b>		\$10,834,490,486		\$16,093,596,170		\$22,719,470,192
<b>RAIL INTERMODAL DRAYAGE FROM RAMP*<sup>T</sup></b>		\$7,833,901,736		\$13,819,376,356		\$20,119,830,222
<b>MISC. FIELD CROPS</b>	1	\$5,443,742,602	2	\$5,746,113,726	6	\$5,610,380,528
<b>PETROLEUM REFINING PRODUCTS</b>	2	\$4,990,433,478	3	\$5,419,395,797	7	\$4,595,539,274
<b>MISSILE OR SPACE VEHICLE PARTS</b>	3	\$2,576,025,326	5	\$4,760,574,303	4	\$6,699,138,508
<b>RAIL INTERMODAL DRAYAGE TO RAMP*<sup>T</sup></b>		\$2,498,435,029		\$4,546,396,491		\$6,826,658,532
<b>DRUGS (MEDICINE)</b>	4	\$2,255,147,456	6	\$4,449,321,950	2	\$8,431,827,245
<b>MALT LIQUORS</b>	5	\$2,221,370,378	8	\$2,727,814,610	9	\$3,062,615,449
<b>SOLID STATE SEMICONDUCTORS</b>	9	\$1,700,145,047	1	\$20,058,373,640	1	\$61,461,298,907
<b>ELECTRONIC DATA PROCESSING EQUIPMENT</b>	10	\$1,647,308,028	4	\$4,787,777,279	3	\$7,954,489,140
<b>ORTHOPEDIC OR PROSTHETIC SUPPLIES</b>	12	\$1,265,490,981	7	\$2,782,386,820	5	\$5,757,333,475

\*Warehouse & Distribution Center, Rail Intermodal Drayage from Ramp, and Rail Intermodal Drayage to Ramp (highlighted in gray) aren’t included in rankings because the identity of the commodity has been altered and is no longer identifiable.

<sup>T</sup>Commodity moved to or from rail.

Source: Transearch 2010, IHS Global Insight

# COLORADO'S LEADING TRADE PARTNERS

Colorado's leading freight trade partners are anticipated to change slightly over time. The following Figures 28 to 33 tell the story of how Colorado's leading trading partners, by Business Economic Area (BEA), will evolve between 2010, 2025, and 2040 for value and tonnage.

BEAs are regional markets, defined by the Bureau of Economic Analysis, that are geographic areas surrounding metropolitan statistical areas (core urban areas with populations of 50,000 or more) or micropolitan statistical areas (with urban core populations over 10,000 but less than 50,000).

Per Transearch 2010, IHS Global Insight data, in 2010 Colorado's leading trade partners by value include:

- Imports - Los Angeles, CA; Salt Lake City, UT; Edmonton, Canada (in Alberta Canada to the north), Wichita, KS; and Grand Island, NE
- Exports - Casper, WY; Albuquerque, NM; Dallas, TX; Salt Lake City, UT; and Wichita, KS

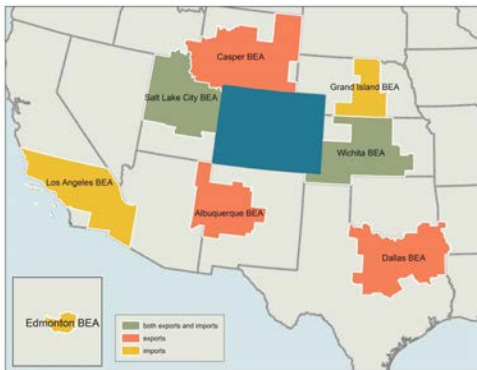


Figure 28: Leading Trading Partners by Value in 2010

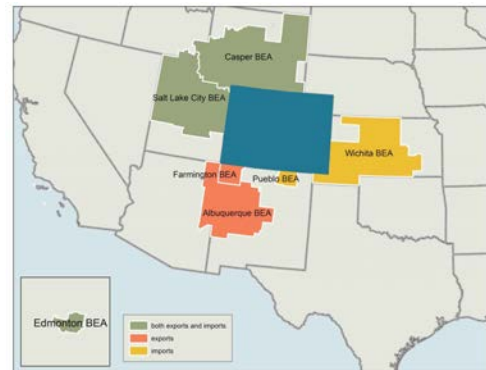


Figure 29: Leading Trading Partners by Weight in 2010

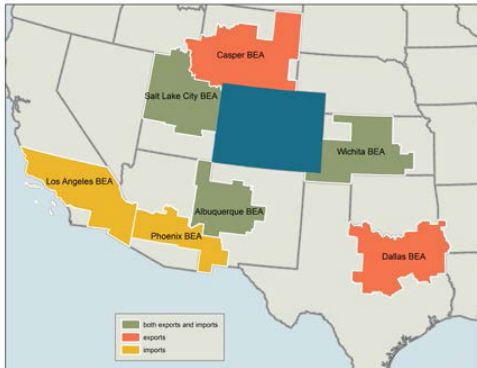


Figure 30: Leading Trading Partners by Value in 2025

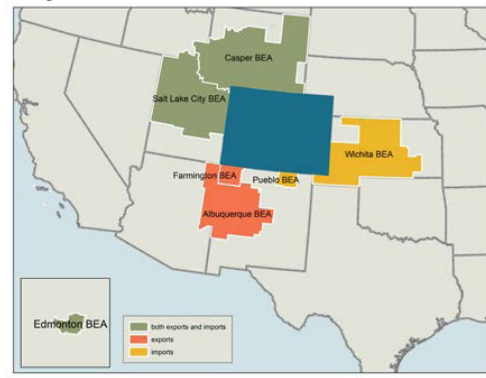


Figure 31: Leading Trading Partners by Weight in 2025

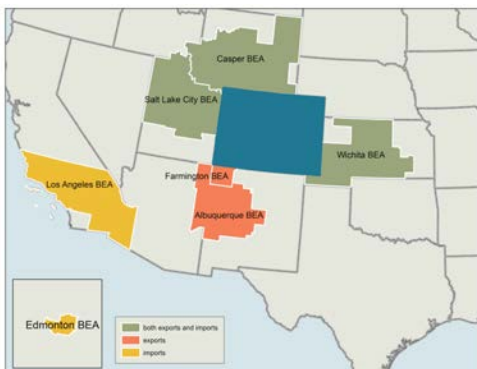


Figure 32: Leading Trading Partners by Value in 2040

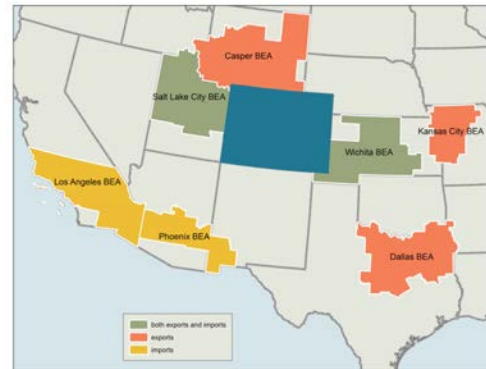


Figure 33: Leading Trading Partners by Weight in 2040

In addition, leading trade partners by tonnage in 2010 include:

- Imports - Casper, WY; Salt Lake City, UT; Edmonton, Canada; Wichita KS; and Pueblo, CO
- Exports - Casper, WY; Salt Lake City, UT; Edmonton, Canada; Albuquerque, NM; and Farmington, NM

Although some shift in trading partners is anticipated over time, in general Colorado’s leading trading partners in 2010 are expected to remain significant trading partners in the future. The locations of these trading partners indicate the importance of certain Freight Corridors to inter-state freight movement, including I-25, I-70, I-76, and US 287.

## EMERGING CHALLENGES AND TRENDS

In developing this State Highway Freight Plan, CDOT realized the importance of identifying emerging challenges and trends related to freight movement. Advances in technology are occurring rapidly, and socio-demographic changes will also influence travel demand on the State Highway System. Table 5 below highlights and summarizes key trends that will influence the movement of freight.

It is difficult to predict how fast these trends will evolve. Monitoring these trends is critical to successfully adapting. Some trends may prove to be counter measures to another, for example, the increase in congestion associated with increased population and travel demand may be mitigated by the many technological advances for transport and the operational improvements that are likely to occur.

Initial steps taken by CDOT to address emerging challenges and opportunities include:

- Creation of the Transportation Systems Management and Operations (TSMO) Division to explore operational efficiencies for the State Highway System in greater detail and give operations more department-wide prominence.
- Formation of the Office of Emergency Management, in response to Colorado’s extreme weather and natural hazard events (floods and wildfires).

The TSMO Division recently completed a Transportation Systems Management & Operation Plan, which was integrated into this State Highway Freight Plan. The Office of Emergency Management is currently developing an Emergency Management Plan.

Other examples of CDOT preparing for challenges and opportunities include: monitoring improvements on speed data to assist with informing travelers on state highways of congestion and traffic incidents as they occur; and a potential pilot study being conducted along I-70 to test connected vehicle technology that would be connected to highway infrastructure, known as vehicle to infrastructure (V2I) technology.

Table 5: Emerging Issues and Trends

POTENTIAL FUTURE TREND	POSSIBLE IMPACTS ON FREIGHT SYSTEM
<b>TECHNOLOGICAL ADVANCES</b> in <b>COMMUNICATION TOOLS</b>	<p>More informed trip planning:</p> <ul style="list-style-type: none"> <li>■ Road Weather Information System (RWIS) that uses environmental sensor stations to report weather in real-time and improve predictive capabilities</li> <li>■ Improved information on traffic conditions</li> <li>■ Enhanced infrastructure condition and location information on: wifi access, runway truck ramps, chain up areas, staging areas, truck parking, etc.</li> </ul>
<b>TECHNOLOGICAL ADVANCES</b> in <b>GOODS DELIVERY</b>	<ul style="list-style-type: none"> <li>■ Unmanned Aerial Vehicles mean fewer trucks on the road.</li> <li>■ Weigh-in-motion translates to more efficient truck travel on the State Highway System</li> </ul>
Advances in <b>INTELLIGENT TRANSPORTATION SYSTEMS (ITS)</b> and <b>TRAFFIC MONITORING</b>	<p>Increased safety and efficiency in travel on the State Highway System due to improvements such as, but not limited to:</p> <ul style="list-style-type: none"> <li>■ Variable Speed Limit (VSL) advisory Signs</li> <li>■ Radios, fiber optic cable, and cameras</li> <li>■ Friction sensors</li> <li>■ Managed Lanes</li> <li>■ Live detour and emergency planning</li> <li>■ Digital Camera Receiving Stations (DCRS)</li> </ul>
Potential widespread usage of <b>3D PRINTING TECHNIQUES</b>	<ul style="list-style-type: none"> <li>■ Altered traffic patterns due to changes in need for long-distance delivery of goods</li> </ul>

POTENTIAL FUTURE TREND	POSSIBLE IMPACTS ON FREIGHT SYSTEM
Increase in "BUY LOCAL" trends	<ul style="list-style-type: none"> <li>■ Altered traffic patterns due to changes in need for long-distance delivery of goods</li> </ul>
Growth in GLOBAL E-COMMERCE	<ul style="list-style-type: none"> <li>■ Altered traffic patterns due to changing demand for product delivery</li> </ul>
POPULATION GROWTH	<ul style="list-style-type: none"> <li>■ Increased congestion based on need for freight transportation to supply growing population and increased vehicle miles traveled</li> </ul>
AGING STATE and NATIONAL POPULATION	<ul style="list-style-type: none"> <li>■ Increased congestion based on greater home delivery need to aging residents</li> </ul>
INCREASED URBANIZATION	<ul style="list-style-type: none"> <li>■ Altered traffic patterns due to dense settlement patterns</li> </ul>
Widespread adoption of CONNECTED VEHICLES	<ul style="list-style-type: none"> <li>■ Significant safety improvement across the entire transportation system</li> <li>■ Improved operational efficiencies related to travel times and getting more capacity out of the highway system</li> </ul>
Widespread adoption of AUTONOMOUS VEHICLES	<ul style="list-style-type: none"> <li>■ Platooning of trucks making freight movement more efficient on State Highways by getting more capacity out of the highway system; thereby reducing congestion and improving travel times</li> </ul>
Changes in ENERGY EXTRACTION and PRODUCTION TECHNIQUES	<ul style="list-style-type: none"> <li>■ Increased asset management costs resulting from heavy vehicle traffic on key energy corridors</li> </ul>
Increased use of ALTERNATIVE TRANSPORTATION FUELS	<ul style="list-style-type: none"> <li>■ Decreased environmental impact of freight transportation, i.e., CNG vehicles</li> </ul>

Source: CDOT, 2015

# CHAPTER VII: FREIGHT CORRIDOR PROJECT AREAS AND IMPROVEMENT STRATEGIES

## CHAPTER VII KEY POINTS

- MAP -21 requires that areas for potential freight projects be identified in a statewide freight plan.
- The methodology used to identify Freight Corridor project areas was data-driven and aligns with the 2040 Statewide Transportation Plan.
- This chapter identifies potential Freight Corridor project areas, needs/issues, and potential improvement strategies that correlate to MAP-21 National Goals.

MAP-21 requires that areas for potential freight corridor projects be identified in a Statewide Freight Plan, in order to be eligible for the increased federal share of freight funding. The increased federal share reduces the local match requirement for eligible projects, but does not increase the total amount of federal funding received by the state.

## PURPOSE AND INTENT

The purpose of this analysis was to identify areas along Colorado's Freight Corridors with freight mobility needs/issues along with potential improvement strategies to address them. This is in compliance with MAP-21 Freight Plan guidance to include "an inventory of facilities with freight mobility issues, such as truck bottle necks, within the state, and a description of the strategies the State is employing to address those freight mobility issues."

Freight facilities with mobility needs/issues were identified including bottlenecks, congestion and safety issues based on a data driven process that links the 2040 Statewide Transportation Plan Goals, Colorado State Highway Freight Plan Goals and the National Freight Goals. The identification of these Freight Corridor Project Areas and Potential Improvement Strategies will ensure flexibility in planning and serve as a starting point for future stakeholder discussions and collaboration in identifying specific freight projects.

## METHODOLOGY

The methodology used to identify the potential Freight Corridor Project Areas was data-driven and aligns with the 2040 Statewide Transportation Plan and this Plan's vision, goals, objectives and strategies.

The following key steps were used to identify the Freight Corridor Project Areas and Potential Improvement Strategies:

1. **Conducted Data Driven Analysis of Freight Corridor Needs/Issues.** Freight Corridors were analyzed and areas were identified (Freight Corridor Project Areas) with the following needs/issues.
  - **Freight Corridor Safety Hotspots:** Areas in which the truck crash rate (crashes per 100 million vehicle miles traveled) is higher than the general crash rate
  - **Freight Corridor Bottlenecks:** Areas in which geometric conditions lead to reduced mobility; including areas with lane drops and/or intersection/interchange deficiencies. Bottlenecks were identified using established FHWA methodologies.
  - **Congested Highway Segments:** Highway segments experiencing congestion as indicated by a Volume/Capacity (V/C) ratio of 0.85 or greater.
  - **Low Vertical Clearance Structures:** Bridges with low vertical clearance with documented bridge strike incidents.
2. **Compared Freight Corridors with needs/issues identified in the 2040 Statewide Transportation Plan Highway Expansion Needs Analysis.** A Highway Expansion Needs Analysis was completed as part of the 2040 Statewide Transportation Plan using safety data, travel time data, and speed data as well as input from planning partners. The Freight Corridor System was compared to areas with identified needs/issues from Highway Expansion Needs Analysis to identify additional Freight Corridor Project Areas. For more information on the Highway Expansion Needs Analysis, see the Needs and Gap Technical Memorandum on the [www.ColoradoTransportationMatters.com](http://www.ColoradoTransportationMatters.com) website.

3. **Identified and eliminated Freight Corridors from further analysis that do not have identified Freight Corridor Project Areas.** Corridors where no needs or issues were identified were removed from further analysis. The Freight Corridors removed from the analysis remain designated Freight Corridors, but do not have specific identified needs/issues necessitating improvement strategies at this time.
4. **Developed a list of Potential Improvement Strategies.** The results of the 2040 Statewide Transportation Plan Highway Expansion Needs Analysis were used to identify preliminary strategies (based on need) to address the Freight Corridor Project Areas. The Potential Improvement Strategies that were identified include:

**SAFETY**

- Auxiliary Lanes
- Climbing Lane
- Communication
- Education
- Maintenance
- Operations/ITS
- Passing Lanes
- Railroad Grade Crossing Improvements
- Runaway Truck Ramps
- Shoulder Improvements
- Truck Parking

**MOBILITY/CONGESTION**

- Climbing Lanes
- Communication
- Education
- Interchange Reconstruction
- Maintenance
- Managed Lanes
- New Interchange
- Operations/ITS
- Passing Lanes
- Shoulders
- Widening

**GEOMETRICS**

- Bridge Replacement
- Interchange Improvements
- Managed Lanes
- Ramp Improvements
- Runaway Truck Ramps
- Shoulders
- Widening

5. **Developed a Freight Corridor Project Areas with Identified Needs/Issues Matrix and a Potential Improvement Strategies with Goals Matrix.** The information is communicated in two separate tables. The first identifies the Freight Corridor Project Areas and the Needs/Issues (see Table 6). The second identifies the Potential Improvement Strategies and the connection to State Highway Freight Plan Goals and the MAP-21 National Freight Policy Goals (see Table 7).

CDOT will use the results of this analysis for future freight project planning and decision-making. At a minimum, Table 6 will be updated annually to reflect the latest information and data analysis. As a result, Freight Corridor Project Areas may be added or removed from this list.

*Table 6: Freight Corridor Project Areas and Needs/Issues*

FREIGHT CORRIDOR PROJECT AREA	NEEDS/ISSUES
US 6: SH 9 junction at I-70 in Dillon to I-70 E of Keystone	Intersection Bottleneck, Lane Drop Bottleneck
US 6: I-25 to I-70	Intersection Bottleneck, Lane Drop Bottleneck, Speed Drop, Bridge Clearance
US 6: SH 58 to I-70	Intersection Bottleneck
US 6: in Sterling between I-76 and SH 44	Safety Hot Spot
SH 13: Wyoming SL to Rifle	Speed Drop, Capacity, Level of Safety Service
SH 14: Logan County Line to US 138	Capacity, Level of Safety Service
SH 14: US 287 to I-25	Speed Drop, Capacity
SH 14: I-25 to Logan County Line	Lane Drop Bottleneck, Level of Safety Service, Safety Hot Spot
SH 17: US 160 to US 285	Level of Safety Service
SH 21: SH 86 to US 24	Intersection Bottleneck, Lane Drop Bottleneck
US 24: US 285 to US 285/US 24 split	Level of Safety Service
US 24: I-70 to US 24	Speed Drop, Level of Safety Service
US 24: US 24 to SH 21	Intersection Bottleneck, Speed Drop, Level of Safety Service
US 24: SH 21 in Limon to I-25	Intersection Bottleneck, Lane Drop Bottleneck, Level of Safety Service
I-25: I-70 to Broadway in Denver	Speed Drop, Capacity, Intersection Bottleneck, Lane Drop Bottleneck, Bridge Clearance, Safety Hot Spot
I-25: Broadway in Denver to C-470	Intersection Bottleneck, Lane Drop Bottleneck
I-25: C-470 to El Paso County Line	Intersection Bottleneck, Lane Drop Bottleneck, Capacity

FREIGHT CORRIDOR PROJECT AREA	NEEDS/ISSUES
I-25: Stem Beach to New Mexico State Line	Speed Drop, Level of Safety Service
I-25: SH 14 in Ft Collins to I-70 in Denver	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service
I-25: Purcell Blvd to Stem Beach	Speed Drop, Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service, Capacity
I-25: Douglas County Line to S Powers	Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service, Capacity
US 34: US 85 to I-76	Intersection Bottleneck, Lane Drop Bottleneck
US 34: US 287 to US 85	Intersection Bottleneck, Lane Drop Bottleneck, Level of Safety Service, Capacity
US 34: I-76 to SH 71	Speed Drop, Level of Safety Service
US 34: SH 71 to the Nebraska State Line	Speed Drop, Level of Safety Service, Safety Hot Spot
US 36: Iris Ave to Baseline Rd	Lane Drop Bottleneck
US 6: Baseline Rd to I-25	Intersection Bottleneck, Lane Drop Bottleneck, Capacity, Safety Hot Spot
US 36: SH 9 to the US 36/US 385 split	Level of Safety Service
US 40: Utah State Line to SH 13	Level of Safety Service
US 40: SH 13 to I-70	Speed Drop, Capacity, Intersection Bottleneck, Level of Safety Service, Safety Hot Spot
US 40: US 287 to Kansas State Line	Speed Drop
US 40: I-70 to US 287	Speed Drop, Level of Safety Service
SH 47: I-25 to US 50B	Level of Safety Service
US 50: Sargents to SH 115	Speed Drop, Level of Safety Service
US 50: Canon City to McCulloch Blvd	Speed Drop
US 50: Montrose to Sargents	Speed Drop, Level of Safety Service, Safety Hot Spot
US 50: McCulloch Blvd to I-25	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck
US 50: SH 141 to Grand Junction	Level of Safety Service
US 50: Pueblo County Line to Kansas State Line	Speed Drop, Level of Safety Service, Safety Hot Spot, Capacity
US 50: I-25 to Pueblo County Line	Intersection Bottleneck, Lane Drop Bottleneck, Capacity
US 50 Business: MP 367 E of Rocky Ford to MP 370 E of Rocky Ford	Capacity
SH 52: SH 119 to I-76	Speed Drop, Capacity
I-70 Business: in Grand Junction between I-70 and SH 50	Safety Hot Spot
I-70: C-470 to I-25	Speed Drop, Capacity, Intersection Bottleneck, Level of Safety Service
I-70: US 6 to Parachute	Level of Safety Service
I-70: Glenwood Springs to Vail Pass	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service, Bridge Clearance, Safety Hot Spot
I-70: I-25 to E-470	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service, Bridge Clearance, Safety Hot Spot
I-70: E-470 to Kansas State Line	Level of Safety Service
I-70: Parachute to Glenwood Springs	Speed Drop
I-70: Utah State Line to SH 139	Level of Safety Service
I-70: SH 139 to US 6	Speed Drop, Level of Safety Service, Safety Hot Spot
SH 71: US 34 to I-70	Speed Drop, Level of Safety Service
SH 71: SH 14 to US 34	Speed Drop, Level of Safety Service
SH 71: Nebraska State Line to SH 14	Level of Safety Service
I-76: Weld County Line to Nebraska State Line	Bridge Clearance, Safety Hot Spot
I-76: I-70 to Weld County Line	Lane Drop Bottleneck, Intersection Bottleneck

FREIGHT CORRIDOR PROJECT AREA	NEEDS/ISSUES
SH 83: C-470 to SH 86	Lane Drop Bottleneck, Capacity
SH 83: SH 86 to SH 21	Capacity, Level of Safety Service
US 85: I-25 at MP 208 to I-25 at MP 184	Lane Drop Bottleneck, Intersection Bottleneck, Capacity
US 85: US 34 to I-76	Speed Drop, Lane Drop Bottleneck, Intersection Bottleneck, Level of Safety Service
US 85: Wyoming State Line to US 34	Speed Drop, Intersection Bottleneck, Level of Safety Service, Safety Hot Spot
SH 93: SH 72 to SH 58	Lane Drop Bottleneck, Intersection Bottleneck, Capacity
SH 119: US 36 to SH 157	Intersection Bottleneck
SH 119: US 287 to E 3rd Ave	Lane Drop Bottleneck
SH 119: SH 157 to US 287	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck
SH 119: E 3rd Ave to I-25	Speed Drop, Intersection Bottleneck
SH 121: US 287 to US 36	Lane Drop Bottleneck
SH 141: US 50 to Grand Junction	Capacity
SH 141 East of Grand Junction between US 50 and US 6	Safety Hot Spot
SH 141: Grand Junction to I-70 Business	Capacity
SH 157: SH 119 to US 36	Lane Drop Bottleneck, Intersection Bottleneck
US 160: E of Monte Vista to E of Alamosa	Safety Hot Spot
US 160: UPRR in Walsenburg to US 160 Business Loop	Speed Drop, Level of Safety Service
US 160: E of La Veta Pass to UPRR in Walsenburg	Level of Safety Service
US 160: W of South Fork to E of Monte Vista	Level of Safety Service
US 160: Archuleta County Line to W of South Fork	Level of Safety Service
US 160: Four Corners to the Archuleta County Line	Speed Drop, Intersection Bottleneck, Lane Drop Bottleneck, Safety Hot Spot
I-225: I-25 to I-70	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck
I-270: I-76 to I-70	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck
I-270: I-25 to I-76	Capacity, Lane Drop Bottleneck, Intersection Bottleneck
US 285: US 160 to US 50	Level of Safety Service
US 285: US 24 to US 50	Speed Drop
US 285: C-470 to Park County Line	Intersection Bottleneck, Capacity
US 285: SH 9 in Fairplay to US 24	Level of Safety Service
US 285: MP 222 to SH 9 in Fairplay	Speed Drop, Level of Safety Service
US 285: Park County Line to MP 222	Level of Safety Service
US 287: US 40 to US 50	Level of Safety Service
US 287: SH 14 to Larimer County Line	Speed Drop, Safety Hot Spot, Capacity
US 287: Wyoming State Line to SH 14	Level of Safety Service
US 287: Larimer County Line to US 36	Lane Drop Bottleneck, Safety Hot Spot
US 385: US 36 to US 40	Speed Drop, Level of Safety Service
US 385: I-76 to US 36	Speed Drop, Level of Safety Service
C-470: I-70 to I-25	Speed Drop, Capacity, Lane Drop Bottleneck, Intersection Bottleneck
US 550: New Mexico State Line to Durango	Intersection Bottleneck, Capacity
US 550: Durango to Montrose	Speed Drop, Intersection Bottleneck, Lane Drop Bottleneck, Level of Safety Service, Capacity



## NEEDS/ISSUES DEFINITIONS

- **Intersection Bottleneck:** Congested area where an intersection or interchange have some influence or impact on congestion (location with a volume to capacity [V/C] ratio greater than 0.85). (Source: CDOT 2012.)
- **Lane Drop Bottleneck:** Congested area (location with a volume to capacity [V/C] ratio greater than 0.85) with a reduction in the number of lanes that has influence or impact on congestion prior to and/or after the lane drop. (Source: CDOT 2012.)
- **Speed Drop:** Corridor Project Area has locations where the travel speed in Needs Database are shown as below 45 MPH on Interstate or below 30 MPH on other (arterial) highways. (Source: FHWA National Performance Research Data Set (NPMRDS), sample Tuesday-Thursday periods in September and October 2013 and March 2014.)
- **Bridge Clearance:** Bridge location identified with low vertical clearance issues. (Source: CDOT 2014.)
- **Capacity:** Corridor Project Area has locations with volume to capacity (V/C) ratio greater than 0.85 in the Needs Database. (Source: CDOT 2013 - 2014.)
- **Level of Safety Service:** Corridor Project Area has locations with a Level of Safety Service 4 in Needs Database (segments of highway with a higher frequency of total crashes than on a similar situated highway elsewhere within the state). (Source: CDOT 2014.)
- **Safety Hot Spot:** Area where the truck crash rate is higher than the general crash rate. (Source: CDOT 2008-2012.)

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Table 7: Potential Improvement Strategies and the Connection to Goals

POTENTIAL IMPROVEMENT STRATEGIES	NEEDS/ISSUES							STATE HIGHWAY FREIGHT PLAN GOAL AREAS					MAP-21 NATIONAL FREIGHT POLICY GOALS									
	SPEED DROP	CAPACITY (V/C)	LANE DROP BOTTLENECK	INTERSECTION BOTTLENECK	LEVEL OF SAFETY SERVICE	BRIDGE CLEARANCE	SAFETY HOT SPOTS	SAFETY	MOBILITY	ECONOMIC VITALITY	ENVIRONMENTAL STEWARDSHIP*	MAINTAINING THE SYSTEM	INFRASTRUCTURE AND OPERATIONAL IMPROVEMENTS	ECONOMIC COMPETITIVENESS AND EFFICIENCY OF THE NFN**	CONGESTION	PRODUCTIVITY***	SAFETY, SECURITY, AND RESILIENCE	STATE OF GOOD REPAIR	USE OF ADVANCED TECHNOLOGY	PERFORMANCE, INNOVATION, COMPETITION, AND ACCOUNTABILITY OF THE NFN**	REDUCE ENVIRONMENTAL IMPACTS*	
<b>Safety</b>																						
Auxiliary Lanes	◆	◆	◆	◆	◆		◆	◆	◆			◆	◆					◆				
Climbing Lanes	◆	◆	◆		◆		◆	◆	◆			◆	◆					◆				
Communication	◆	◆	◆	◆	◆	◆	◆	◆	◆				◆					◆	◆			
Education	◆	◆	◆	◆	◆	◆	◆	◆	◆				◆					◆	◆			
Maintenance	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆						◆	◆			
Operations/ITS	◆	◆	◆	◆	◆	◆	◆	◆	◆				◆					◆	◆			
Passing Lanes	◆	◆			◆		◆	◆	◆			◆	◆					◆				
Railroad Grade Crossing Improvements	◆	◆	◆		◆		◆	◆	◆			◆	◆					◆				
Runaway Truck Ramps					◆		◆	◆				◆	◆					◆				
Shoulders	◆	◆			◆		◆	◆	◆			◆	◆					◆				
Truck Parking	◆	◆			◆		◆	◆	◆			◆	◆					◆	◆			
<b>Mobility/Congestion</b>																						
Climbing Lanes	◆	◆	◆		◆		◆	◆	◆	◆		◆	◆		◆			◆				
Communication	◆	◆	◆	◆	◆	◆	◆	◆	◆				◆		◆			◆	◆			
Education	◆	◆	◆	◆	◆	◆	◆	◆	◆				◆		◆			◆	◆			
Interchange Reconstruction	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		◆			◆				
Maintenance	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		◆			◆				
Managed Lanes	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	◆		◆			◆	◆			
New Interchange	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	◆		◆			◆				
Operations/ITS	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆		◆		◆		◆			
Passing Lanes	◆	◆	◆		◆		◆	◆	◆	◆		◆	◆		◆			◆				
Shoulders	◆	◆	◆		◆		◆	◆	◆	◆		◆	◆		◆			◆				
Widening	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	◆		◆			◆				
<b>Geometrics</b>																						
Bridge Replacement	◆	◆			◆	◆	◆	◆		◆		◆	◆				◆	◆				
Interchange Improvements	◆	◆		◆	◆		◆	◆		◆		◆	◆					◆				
Managed Lanes	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	◆		◆			◆	◆			
Ramp Improvements		◆		◆	◆		◆	◆		◆		◆	◆					◆				
Runaway Truck Ramps					◆		◆	◆				◆	◆					◆	◆			
Shoulders	◆	◆	◆		◆		◆	◆	◆	◆		◆	◆		◆			◆				
Widening	◆	◆	◆	◆	◆		◆	◆	◆	◆		◆	◆		◆			◆				

\* Environmental Issues will be addressed on all proposed projects. In general projects that address congestion or mobility issues would have a positive impact on air quality.

\*\* The National Freight Network (NFN) has not been identified by FHWA at the time of publication.

\*\*\* This requires a local economic analysis to be conducted during proposed project development.

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# CHAPTER VIII: VISION, GOALS, OBJECTIVES, AND POLICY STRATEGIES

## CHAPTER VIII KEY POINTS

- Vision, goals, objectives and policy strategies for the Colorado Freight System have been developed that support the national freight policy and are in alignment with MAP-21.
- Policy strategies were identified to make progress towards achieving objectives.

## VISION

In recognition that Colorado’s transportation system constitutes a valuable resource and a major public investment that directly affects the economic vitality of the state, the following vision was developed for the Colorado Freight System:

*The Colorado Freight System will support the economic vitality of the state by providing for the safe, efficient, coordinated, and reliable movement of freight.*

## DEVELOPMENT OF GOALS, OBJECTIVES, AND POLICY STRATEGIES

### THE STATEWIDE PLANNING PROCESS AND PLAN INTEGRATION

The vision, goals, and policy strategies identified in this Plan were developed in alignment with various CDOT plans:

- 2040 Statewide Transportation Plan
- Statewide Transit Plan
- Strategic Highway Safety Plan
- Statewide Transportation System Management and Operations Plan
- Freight and Passenger Rail Plan
- Bicycle and Pedestrian Plan
- Aviation Plan
- Risk-Based Asset Management Plan
- CDOT Action Plan

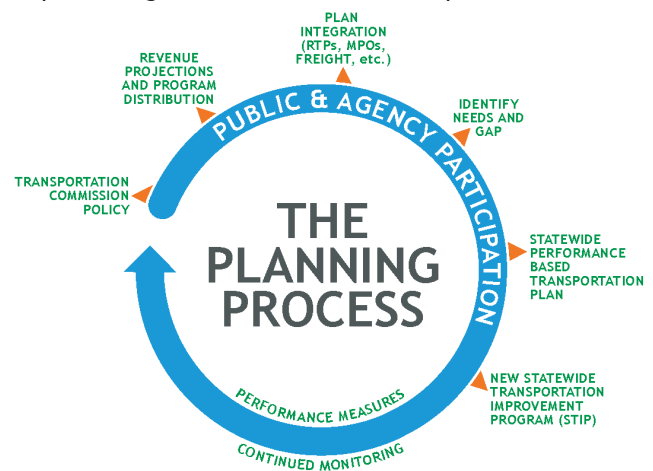


Figure 34: Statewide Planning Process

The 2040 Statewide Transportation Plan incorporated goals, and identified strategic actions derived from other CDOT plans (both existing and some still under development). The 2040 Statewide Transportation Plan is updated approximately every five years, includes an extensive public involvement process, and incorporates available information from all areas within CDOT that have relevant information related to statewide planning. CDOT then links the 2040 Statewide Transportation Plan’s goals to the project programming process through the development of the four-year Statewide Transportation Improvement Program (STIP), which CDOT uses to directly program dollars to projects.

A depiction of the statewide planning process that includes freight plan development is presented in Figure 34.

Several plans are first time plans, such as the Statewide Transportation Systems Management and Operations Plan, the Statewide Transit Plan, and the Action Plan. Other plans are required or are strongly encouraged to be developed by MAP-21, including this State Highway Freight Plan. Several plans have been developed on an on-going basis for many years, due to state and federal requirements, such as: the State Highway Safety Plan, and the Regional Transportation Plans.

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## FREIGHT GOALS, POLICY STRATEGIES, AND LINK TO NATIONAL GOALS

Table 8 shows a summary of the connections between the goals, objectives, and policy strategies of the State Highway Freight Plan, both with one another and with MAP-21 and 2040 Statewide Transportation Plan goals. Table 8 conveys how the State Highway Freight Plan goals and policy strategies align with MAP-21 National Freight Policy Goals.

Table 8: Goals, Objectives, and Policy Strategies

STATEWIDE PLAN GOAL AREAS & STRATEGIC POLICY ACTIONS	STRATEGIC HIGHWAY FREIGHT PLAN GOALS	STATE HIGHWAY FREIGHT PLAN OBJECTIVES	STATE HIGHWAY FREIGHT PLAN POLICY STRATEGIES	MAP-21 NATIONAL FREIGHT POLICY GOALS									
				INFRASTRUCTURE AND OPERATIONAL IMPROVEMENTS	ECONOMIC COMPETITIVENESS AND EFFICIENCY OF THE NFN*	CONGESTION	PRODUCTIVITY	SAFETY, SECURITY, AND RESILIENCE	STATE OF GOOD REPAIR	USE OF ADVANCED TECHNOLOGY	PERFORMANCE, INNOVATION, COMPETITION, AND ACCOUNTABILITY OF THE NFN*	REDUCE ENVIRONMENTAL IMPACTS	
<b>SAFETY:</b> Move Colorado toward zero deaths by reducing traffic-related deaths and serious injuries.	Improve the safety of the Colorado Freight System.	Reduce the number of fatalities and serious injuries on Freight Corridors.	<b>Data-Driven Planning</b> - Identify and prioritize road safety problems using data-driven processes to support implementation of the most effective improvements to reduce roadway crashes.	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
		Reduce the number of truck crashes statewide.	<b>Highway Truck Crash Reduction</b> - Identify corridors and hot spots with truck crash rates higher than the overall crash rate and prioritize improvements for investment.	◆	◆	◆	◆	◆			◆	◆	
		Reduce truck crashes on Freight Corridors and in commercial vehicle crash hot spots.	<b>Bridge Strike Reduction</b> - Identify causes and trends of bridge strike incidents and actions to reduce future bridge strikes.	◆	◆	◆	◆	◆	◆		◆	◆	
		Address highway geometric issues affecting freight safety and movement.	<b>Targeted Crash Type Mitigation</b> - Analyze data to identify trends in truck crash types and identify solutions including public outreach to educate drivers concerning factors relating to the most common truck crash types.	◆	◆	◆	◆	◆			◆	◆	
			<b>Improved Access to Safe Truck Parking Facilities</b> - Update truck parking facility study and develop action plan for addressing current and future truck parking needs.	◆	◆		◆	◆	◆	◆		◆	
<b>MOBILITY:</b> Improve mobility and connectivity with a focus on operations and transportation choice.	Improve the mobility of the Colorado Freight System.	Limit increases in congestion and increase travel reliability (as measured by Planning Time Index).	<b>Geometric Improvements</b> - Identify segments on Freight Corridors with deficient geometric conditions.	◆	◆	◆	◆	◆	◆			◆	
			<b>Bottleneck Assessments</b> - Identify and monitor freight bottlenecks and develop proposed solutions.	◆	◆	◆	◆	◆		◆	◆		
			<b>Travel Time Reliability on Freight Corridors</b> - Further develop the travel time program to include specific freight and commercial vehicle measures and objectives.	◆	◆	◆	◆	◆		◆	◆		
			<b>Intelligent Transportation Systems</b> - Explore use of all types of ITS enhancements, and develop “push” notifications for in-cab systems and improve the accuracy and timeliness of personalized traveler information based on individual preferences.	◆	◆	◆	◆	◆		◆	◆		
			<b>Monitor Local Freight Ordinances</b> - Monitor and disseminate information on local freight ordinances to assist industry compliance with local ordinances.	◆	◆		◆				◆		
			<b>Corridor Studies</b> - Conduct Freight Corridor studies as deemed appropriate to determine phased approach to implementation of needed freight improvements.	◆	◆	◆	◆	◆		◆	◆	◆	
		Improve connectivity between freight facilities and destinations.	<b>Identify Connectivity Gaps</b> - Identify gaps in the connectivity of freight infrastructure.	◆	◆		◆			◆			
			<b>Freight Trip Planning Resource</b> - Compile freight trip planning information in one convenient on-line location.	◆	◆	◆	◆	◆		◆	◆	◆	
		Mitigate non-recurring congestion and improve travel time by reducing crashes on Freight Corridors and improving clearance times.	<b>Enhanced Incident Management</b> - Enhance traffic incident management and response using real-time road information.	◆	◆	◆	◆	◆		◆	◆	◆	
			<b>Heavy Tow</b> - Continue to implement Heavy Tow program for commercial vehicles on I-70 corridor and consider options for expansion to I-25.	◆	◆	◆	◆	◆		◆	◆	◆	
Maintain mobility of the freight system during of natural disasters and extreme weather events.	<b>Risk and Resiliency Planning</b> - Develop a Risk and Resiliency Framework for the State Highway System to better prepare for the structural and economic impacts of future natural or man-made disasters.	◆	◆	◆	◆	◆	◆	◆	◆	◆			

\* The National Freight Network (NFN) has not been identified by FHWA at the time of publication.

STATEWIDE PLAN GOAL AREAS & STRATEGIC POLICY ACTIONS	STRATEGIC HIGHWAY FREIGHT PLAN GOALS	STATE HIGHWAY FREIGHT PLAN OBJECTIVES	STATE HIGHWAY FREIGHT PLAN POLICY STRATEGIES	MAP-21 NATIONAL FREIGHT POLICY GOALS								
				INFRASTRUCTURE AND OPERATIONAL IMPROVEMENTS	ECONOMIC COMPETITIVENESS AND EFFICIENCY OF THE NFN*	CONGESTION	PRODUCTIVITY	SAFETY, SECURITY, AND RESILIENCE	STATE OF GOOD REPAIR	USE OF ADVANCED TECHNOLOGY	PERFORMANCE, INNOVATION, COMPETITION, AND ACCOUNTABILITY OF THE NFN*	REDUCE ENVIRONMENTAL IMPACTS
<b>ECONOMIC VITALITY:</b> Improve the competitiveness of the state economy through strategic transportation investments.	Improve economic vitality through freight investments, programs, and initiatives.	Support freight decision-making through expanded analysis, dissemination, and use of data and industry trends in the planning process.	<b>Monitor Freight Trends</b> - Monitor freight trends to better support freight decision-making.	◆	◆	◆	◆	◆		◆	◆	
		Identify freight investments, programs, and initiatives that enhance the competitiveness of the Colorado Freight System	<b>Stakeholder Communication</b> - Enhance communication and coordination with freight stakeholders and federal, state, and local agencies while seeking out opportunities to support local economies.	◆	◆	◆	◆	◆	◆	◆	◆	◆
<b>MAINTAINING THE SYSTEM:</b> Preserve and maintain the existing transportation system.	Improve maintenance of the Colorado Freight System.	Maintain bridge and pavement condition on Freight Corridors.	<b>Prioritize Infrastructure Improvements</b> - Identify pavement and bridge projects on Freight Corridors where the current condition of infrastructure or geometric deficiencies have a significant limiting effect on freight movement.	◆	◆	◆	◆	◆	◆	◆	◆	◆
		Maintain auxiliary assets (lights, signage, tunnels, culverts, etc.) on Freight Corridors.	<b>Freight Project Criteria</b> - Develop and implement criteria for freight projects in selection and prioritization of asset management projects.	◆	◆	◆	◆	◆	◆	◆		
<b>SUSTAINABILITY AND THE ENVIRONMENT:</b> Continue to implement CDOT's Sustainability Plan and other environmental initiatives.	Improve sustainability and reduce environmental impacts of freight movement.	Improve the energy efficiency of freight movement and reduce associated levels of greenhouse gas emissions.	<b>Truck Electrified Parking</b> - Explore opportunities to implement TEP at rest areas and other locations.	◆	◆		◆	◆		◆		◆
			<b>Promote Vehicle Efficiency</b> - Promote and disseminate information on policy strategies and programs to improve freight vehicle efficiency.	◆	◆		◆	◆		◆	◆	◆

\* The National Freight Network (NFN) has not been identified by FHWA at the time of publication.



# FREIGHT GOALS

## IMPROVE THE SAFETY OF THE COLORADO FREIGHT SYSTEM

CDOT's 2040 Statewide Transportation Plan includes a safety goal intended to "move Colorado toward zero deaths by reducing traffic-related deaths and serious injuries." CDOT believes that this is an achievable goal, and the policy strategies needed to make it a reality are laid out in detail in the Strategic Highway Safety Plan, available on the 2040 Statewide Transportation Plan website: [www.ColoradoTransportationMatters.com](http://www.ColoradoTransportationMatters.com).

While freight related crashes occur at a lower rate than those of the general traveling public, some corridors experience higher instances and require safety improvements to advance this goal. Freight vehicle crashes also show a higher elevation of certain crash types in comparison to the general population, indicating specific vulnerabilities to be addressed.

The State Highway Freight Plan establishes four objectives in support of the safety improvement goal:

- Reduce the number of fatalities and serious injuries on Freight Corridors
- Reduce the number of truck crashes statewide
- Reduce truck crashes on Freight Corridors and in commercial vehicle crash hot spot
- Address highway geometric issues affecting freight safety and movement

## IMPROVE MOBILITY OF THE COLORADO FREIGHT SYSTEM

The 2040 Statewide Transportation Plan includes the goal to "improve mobility and connectivity with a focus on operations and transportation choice." The Statewide Transportation System Management and Operations (TSMO) Plan operational strategies to address system performance and mobility issues, and is available on the 2040 Statewide Transportation Plan website.

While congestion is a problem for all users of the State Highway System, the effects of congestion on the efficient movement of freight are of particular concern due to the economic impacts of delayed freight arrival and other inefficiencies.

The State Highway Freight Plan establishes four objectives in support of the mobility goal:

- Limit increases in congestion and increase travel reliability (as measured by Planning Time Index)
- Improve connectivity between freight facilities and destinations
- Mitigate non-recurring congestion and improve travel time by reducing crashes on Freight Corridors and improving clearance times

- Maintain mobility of the freight system during natural disasters and extreme weather events

## IMPROVE ECONOMIC VITALITY THROUGH FREIGHT INVESTMENTS, PROGRAMS, AND INITIATIVES

The 2040 Statewide Transportation Plan identifies economic vitality as a goal to "improve the competitiveness of the state economy through strategic transportation investments." CDOT is currently working to develop the tools and policies needed to effectively incorporate economic benefit considerations into the planning process.

Apart from the freight industry's role in transporting necessary goods, it also encourages national and international trade by Colorado's businesses and allows for key industries like agriculture and energy development to sell their products. In recent years the critical importance of the transportation system to the state economy has become more widely recognized, and a greater emphasis is being placed on the economic benefits of transportation investments.

The State Highway Freight Plan establishes two objectives in support of the economic vitality goal:

- Support freight decision-making through expanded analysis, dissemination, and use of data and industry trends in the planning process
- Identify freight investments, programs, and initiatives that enhance the competitiveness of the Colorado Freight System

## IMPROVE MAINTENANCE OF THE COLORADO FREIGHT SYSTEM

A key goal of the 2040 Statewide Transportation Plan is to "preserve and maintain the existing transportation system." CDOT's guide for maintaining the existing system is the Risk-Based Asset Management Plan (RB-AMP), available on the 2040 Statewide Transportation Plan website.

The good condition of pavement and bridges is critical to a safe and efficient freight system, as are bridge and highway geometrics that adequately accommodate freight traffic. Highways and bridges in poor condition or not meeting geometric standards can limit freight movement and create safety issues.

The State Highway Freight Plan establishes two objectives in support of the infrastructure improvement goal:

- Maintain bridge and pavement condition on Freight Corridors
- Maintain auxiliary assets (lights, signage, tunnels, culverts, etc.) on Freight Corridors

## IMPROVE SUSTAINABILITY AND REDUCE ENVIRONMENTAL IMPACTS OF FREIGHT MOVEMENT

CDOT's 2040 Statewide Transportation Plan includes Sustainability and the Environment as a strategic policy action to "continue to implement CDOT's Sustainability Plan and other environmental initiatives" and "ensure all projects undergo timely and proper environmental review and compliance." More information can be found on the CDOT Environmental Programs webpage at <http://www.codot.gov/programs/environmental>.

The transportation system provides the backbone of a vibrant economy by connecting people with jobs and providing for the movement of goods, but it is also the source of substantial environmental impacts. Transportation is the 2nd highest producer of greenhouse gas emissions in the U.S., while on-road vehicles account for 84% of transportation emissions, and medium and heavy duty account for a little more than a quarter of on-road vehicle emissions. Freight activities can also produce other forms of pollution, such as excessive noise.

The State Highway Freight Plan established one objective to support the Sustainability and Environment goal:

- Improve the energy efficiency of freight movement and reduce the associated levels of greenhouse gas emissions.

## FREIGHT POLICY STRATEGIES

The following freight policy strategies are presented by their primary goal areas of: Safety, Mobility, Economic Vitality, Maintenance, and Sustainability and Environment. Plans for implementing these freight policy strategies will be determined during the development of the Integrated Freight Plan.

### SAFETY

#### DATA DRIVEN PLANNING

- **Primary Goal Area:** Safety
- **Summary:** Identify and prioritize road safety problems using data-driven processes to support implementation of the most effective improvements to reduce roadway crashes.

Data-driven planning helps to more objectively spotlight emerging or ongoing data issues and assess the best means of addressing them. It also removes potential political or geographic biases from the equation in order to target funds where they are needed most. Additionally, data-driven planning as described in the Colorado Strategic Highway Safety Plan, allows for better performance measurement and assessment following an investment.

CDOT is continuing to work on incorporating data at all levels of planning, including efforts related to safety and freight.

## HIGHWAY TRUCK CRASH REDUCTION

- **Primary Goal Area:** Safety
- **Summary:** Identify corridors and hot spots with truck crash rates higher than the overall crash rate and prioritize improvements for investment.

Freight Corridors with a truck crash rate higher than the total crash rate will be identified and prioritized for safety improvements, in keeping with the Colorado Strategic Highway Safety Plan's overall vision to reach zero deaths from traffic crashes and the 2040 Statewide Transportation Plan safety goal to move the state toward zero deaths by reducing traffic-related deaths and serious injuries. A hot spot analysis will also be completed in order to identify specific locations on Freight Corridors with safety issues. This information will be used by CDOT staff when considering where to make safety investments and post-improvement monitoring will occur in order to identify the most effective methods for addressing common safety issues.

## BRIDGE STRIKE REDUCTION

- **Primary Goal Area:** Safety
- **Secondary Goal Area:** Maintenance
- **Summary:** Identify causes and trends of bridge strike incidents and actions to reduce future bridge strikes.

A comprehensive list of "low clearance" structures has been developed in an effort to prevent infrequent but often damaging bridge strike crashes. An analysis of the elements of bridge strikes will be conducted to determine factors such as location, truck/equipment type, or driver habits which contribute to bridge strike incidents, and policy strategies will be identified to prevent future bridge strikes. Findings will be made available in an annual report on bridge strike incidents.

## TARGETED CRASH TYPE MITIGATION

- **Primary Goal Area:** Safety
- **Summary:** Analyze data to identify trends in truck crash types and identify solutions including public outreach to educate drivers concerning factors relating to the most common truck crash types.

Crash data will continue to be analyzed to identify crash types and trends, better understand the causes of specific crash types, and develop programs to inform all drivers (commercial vehicles and others) of ways to avoid the most common types of truck crashes, such as sideswipes and rear-end collisions. Reducing truck crashes is in keeping with the Colorado Strategic Highway Safety Plan's overall vision to reach zero deaths from traffic crashes and the 2040 Statewide Transportation Plan goal to move the state toward zero deaths by reducing traffic-related deaths and serious injuries.

## IMPROVED ACCESS TO SAFE TRUCK PARKING FACILITIES

- **Primary Goal Area:** Safety
- **Secondary Goal Area:** Mobility
- **Summary:** Update truck parking facility study and develop action plan for addressing current and future truck parking needs.

In 2007, CDOT published Truck Parking Issues at State Facilities in Colorado, which identified deficiencies in truck parking across the state. The report found 774 additional truck parking spaces were needed to meet statewide demand. Existing truck parking and projected needs can be found in Chapter V.

The truck parking facility study will be updated to identify current and future truck parking needs on the State Highway System and include an action plan for addressing them, including the potential for funding through the National Highway Performance Program (NHPP), Surface Transportation Program (STP), and Highway Safety Improvement Program (HSIP) under MAP-21.

## GEOMETRIC IMPROVEMENTS

- **Primary Goal Area:** Safety
- **Secondary Goal Area:** Mobility
- **Summary:** Identify segments on Freight Corridors with deficient geometric conditions.

The American Association of State Highway and Transportation Officials (AASHTO) recommends minimum geometric designs for the safe and efficient movement of freight, including elements such as lane and shoulder width, grade, and climbing lane requirements.

Freight corridor segments with deficient geometric conditions will be identified and prioritized for improvement as a means of improving the safety and operational efficiency of the statewide freight system.

## MOBILITY

### BOTTLENECK ASSESSMENTS

- **Primary Goal Area:** Mobility
- **Summary:** Identify and monitor freight bottlenecks, and develop proposed solutions.

Bottlenecks are areas in which the volume of traffic is constricted to the point that it affects flow into other segments of roadways. This may be due to inadequate roadway capacity, major intersections and interchanges, lane drops, or highways with severe grades. Bottlenecks are one of the sources of congestion targeted for operational policy strategies in the Statewide Transportation System Management and Operations Plan.

CDOT is currently able to identify bottlenecks at intersections, interchanges, and lane drops but data is insufficient for identifying those caused by severe grades. CDOT will continue

to work to establish a more comprehensive inventory of bottlenecks on the State Highway System including those on Freight Corridors, and to identify associated improvements.

## TRAVEL TIME RELIABILITY ON FREIGHT CORRIDORS

- **Primary Goal Area:** Mobility
- **Summary:** Further develop the travel time program to include specific freight and commercial vehicle measures and objectives.

Travel time is used to measure the performance of a roadway by comparing expected travel times to observed travel times. Currently CDOT and other state departments of transportation do not have truck Planning Time Index (PTI) and travel time delay data for commercial vehicles separate from general traffic data. The field of study is rapidly changing with emerging technologies having the potential to make such information available in the future.

CDOT will continue to develop the travel time program including the development of PTI measures and objectives for individual Freight Corridors and, as the data becomes available, PTI measures and objectives specific to commercial vehicle traffic. Once developed, freight-specific travel time information will be made available to industry stakeholders in order to improve the predictability of travel times.

## INTELLIGENT TRANSPORTATION SYSTEMS

- **Primary Goal Area:** Mobility
- **Summary:** Explore use of all types of ITS enhancements, and develop “push” notifications for in-cab systems and improve the accuracy and timeliness of personalized traveler information based on individual preferences.

The Colorado Transportation Management Center currently uses a variety of tools and technologies to actively address real-time traffic movement on certain segments of the State Highway System. Information is provided to the traveling public through the [www.CoTrip.org](http://www.CoTrip.org) website, variable message signs along the highways, and other means of communication.

To address freight-specific needs, CDOT will explore all types of potential ITS enhancements including but not limited to:

- Roadway Weather Information System (RWIS)
- Variable messaging signs (VMS)
- Radios and cameras
- Friction Sensors
- Managed Lanes
- Live detour and emergency planning

In addition, the development of a system to send “push” notifications to in-cab systems advising drivers of current weather and traffic conditions or other pertinent information will be investigated. CDOT will also explore using its existing personalized traveler information tools and identify

opportunities to use these systems to target commercial drivers and their unique needs.

## ENHANCED INCIDENT MANAGEMENT

- **Primary Goal Area:** Mobility
- **Secondary Goal Area:** Safety
- **Summary:** Enhance traffic incident management and response using real-time road information.

Traffic Incident Management is the systematic, planned, and coordinated use of staff, institutional, and technical resources to reduce the duration and impact of non-recurring roadway incidents such as crashes. The goal is to improve the safety of motorists, crash victims, and responders as well as limit the operational effects on the broader transportation system, such as secondary crashes or congestion on adjacent segments. The enhancement of incident management therefore produces both system performance and safety benefits for the movement of freight, as well as for the general traveling public. Reducing the amount of time it takes to clear crashes is one of the goals of the Statewide Transportation System Management and Operations Plan.

CDOT will continue to employ its Traffic Incident Management Plans already in place for key corridors while enhancing its ability to use technology to better monitor incidents in real-time. The Colorado Transportation Management Center will transition in its role from primarily providing information to the traveling public into one of more actively managing operations and incident response on a statewide level.

## HEAVY TOW

- **Primary Goal Area:** Mobility
- **Summary:** Continue to implement Heavy Tow program for commercial vehicles on I-70 corridor and consider options for expansion to I-25.

Heavy Tow is a service provided by CDOT to assist commercial vehicle drivers stranded along the State Highway System due to mechanical or operational issues. By providing this service, CDOT helps to ensure that commercial truck drivers can continue their journeys as quickly and as safely as possible, while also minimizing the delay for other vehicles.

Currently this service is only available for commercial vehicles on the I-70 West corridor. CDOT will continue the Heavy Tow program along this corridor and examine options for extending the service to I-25 and other corridors. By using predictive traffic data, crash patterns, and weather data, CDOT proposes in the Statewide Transportation System Management and Operations Plan to optimize Heavy Tow on I-70 West.

## IDENTIFY CONNECTIVITY GAPS

- **Primary Goal Area:** Mobility
- **Summary:** Identify gaps in the connectivity of freight infrastructure.

Connectivity gaps may occur in the freight system due to physical barriers, congestion, or other travel restrictions.

No matter the source, these gaps increase delays and are responsible for a disproportionate amount of the total cost of shipping goods.

CDOT will work to identify connectivity gaps in the Colorado Freight System and devise potential solutions to limit their negative effects on cost, travel time, and overall economic efficiency.

## RISK AND RESILIENCY PLANNING

- **Primary Goal Area:** Mobility
- **Secondary Goal Areas:** Safety, Economic Vitality, Maintenance, Sustainability and Environment
- **Summary:** Develop a Risk and Resiliency Framework for the State Highway System to better prepare for the structural and economic impacts of future natural or man-made disasters.

Recent high-profile weather events in Colorado have highlighted the importance of resiliency and redundancy to the effective operation of the State Highway System, including the movement of freight. As part of its Futures Forward Initiative, CDOT has identified Extreme Weather as one of five future-oriented topics meriting increased study and advanced planning. This includes potential policy strategies to prepare for increased extreme weather events, better mitigate their effects, and ensure continued highway operations and freight movement in the face of both natural and man-made disasters.

As outlined in the 2040 Statewide Transportation Plan, CDOT will consider the information gathered by the Futures Forward Initiative and use it to develop a Risk and Resiliency Framework. The CDOT Emergency Management Office will also develop an emergency preparedness and response program focusing on community and agency coordination, communications protocols, and the identification of key alternative routes for freight and all other highway traffic for use in the event of an emergency.

## CORRIDOR STUDIES

- **Primary Goal Area:** Mobility
- **Summary:** Conduct Freight Corridor studies as deemed appropriate to determine phased approach to implementation of needed freight improvements.

With Freight Corridors identified for Colorado, next steps for CDOT will include assessing corridors further to identify the most cost-effective measures to improve freight movement along these corridors.

CDOT will investigate methods to conduct corridor studies or follow up on existing studies, including benefit/cost analysis of freight improvements along Freight Corridors.

## FREIGHT TRIP PLANNING RESOURCE

- **Primary Goal Area:** Mobility
- **Summary:** Compile freight trip planning information in one convenient on-line location.

Truck drivers would benefit significantly from having a one-stop location to identify information to aid in trip planning - from real-time weather and traffic conditions, to locations of rest areas, truck parking facilities, runaway truck ramps, weigh stations, chain up areas, and other information, prior to embarking on a trip.

CDOT will work towards compiling freight trip planning information in one convenient on-line location to increase the convenience and efficiency of freight trip planning and freight trip implementation.

## MONITOR LOCAL FREIGHT ORDINANCES

- **Primary Goal Area:** Mobility
- **Summary:** Monitor and disseminate information on local freight ordinances to assist industry compliance with local ordinances.

Every year local jurisdictions report to CDOT on the locally maintained roadway system as statutorily required for the state Highway Users Tax Fund (HUTF). This established reporting process can also be used to monitor local ordinances affecting freight movements such as curfews, noise restrictions, or others.

Information collected from local jurisdictions will be published and made available to transportation providers and other interested freight stakeholders through a directory of statewide ordinances and regulations, allowing the freight industry to better adjust its operations to comply with local ordinances and thereby avoid fines, delays, and other inefficiencies. This information would potentially feed into a freight trip planning resource.

## ECONOMIC VITALITY

### MONITOR FREIGHT TRENDS

- **Primary Goal Area:** Economic Vitality
- **Secondary Goal Areas:** Maintenance, Mobility
- **Summary:** Monitor freight trends to better support freight decision-making.

The important connection between the state transportation system and Colorado's freight industry cannot be overstated. This relationship flows both ways, with transportation problems and solutions impacting the success of industry and freight sector trends likewise affecting the overall needs and performance of the statewide transportation system. A better understanding of current and future freight trends will strengthen planning and project selection, and maximize the benefits of transportation investments. The importance of freight and economic growth is further underscored in the 2040 Statewide Transportation Plan objective to support policy strategies and operational improvements that facilitate multimodal freight movement and promote state, regional, and local economic goals.

CDOT will work to improve freight policy and decision-making by expanding the analysis, dissemination, and use of economic data and trends, and seeking closer collaboration with industry stakeholders. This information would potentially be a component of an on-line freight trip planning resource.

## STAKEHOLDER COMMUNICATION

- **Primary Goal Area:** Economic Vitality
- **Summary:** Enhance communication and coordination with freight stakeholders and federal, state, and local agencies while seeking out opportunities to support local economies.

Economic vitality is the central goal of the Colorado Freight Corridors and one which stakeholders from across the state are interested in advancing. It is important to develop relationships between the numerous parties who have a stake in successful freight movement in Colorado, including representatives of business, government, and local communities. Recognizing that business needs often change more swiftly than those of the general public, it should be a goal of CDOT and its partners to maximize the participation of the private sector in freight planning activities moving forward.

## MAINTENANCE

### PRIORITIZE INFRASTRUCTURE IMPROVEMENTS

- **Primary Goal Area:** Maintenance
- **Summary:** Identify pavement and bridge projects on Freight Corridors where the current condition of infrastructure or geometric deficiencies have a significant limiting effect on freight movement.

Infrastructure deficiencies can reduce mobility and decrease operational efficiencies. A priority list of Freight Corridor infrastructure improvements, including geometric issues, will be developed in conjunction with the FAC), key stakeholders, and CDOT Asset Managers.

### FREIGHT PROJECT CRITERIA

- **Primary Goal Area:** Maintenance
- **Summary:** Develop and implement criteria for freight projects in selection and prioritization of asset management projects.

Freight infrastructure needs can be distinct from those of the broader traveling public and infrastructure deficiencies on Colorado Freight Corridors may have more negative economic consequences than elsewhere. CDOT will work to integrate freight project criteria and data on the economic benefits of freight projects into the asset management decision-making process. This will help implement the project selection and programming strategic policy action in the 2040 Statewide Transportation Plan. The strategic policy action states that CDOT will continue to make more effective and efficient use of limited funding through data-driven decision-making for project selection.

## SUSTAINABILITY AND ENVIRONMENT

### TRUCK ELECTRIFIED PARKING (TEP)

- **Primary Goal Area:** Sustainability and Environment
- **Secondary Goal Area:** Mobility
- **Summary:** Explore opportunities to implement TEP at rest areas and other locations.

Truck idling during driver rest periods wastes fuel and contributes to greenhouse gas (GHG) emissions. In 2012, CDOT investigated the potential to install truck electrified parking (TEP) equipment at rest areas to reduce truck idling by allowing drivers to use cabin lights, heat, and electrical outlets without running vehicle engines. Plans for a TEP pilot project were stalled due to statutory conflicts relating to the commercialization of rest areas.

TEP remains a promising opportunity to improve truck parking facilities and reduce environmental impacts. CDOT will explore possible resolutions to the regulatory conflict and explore opportunities to partner with the private sector in developing TEP locations.

## PERFORMANCE MEASURES

At CDOT Policy Directive (PD) 14 guides development of the 2040 Transportation Plan, its implementation, and future investment decisions that balance preservation and maintenance, efficient system management and operation strategies, and capacity improvements. PD 14 includes one performance measure specific to freight in the Goal Area of System Performance - *"Maintain a Planning Time Index (PTI) of 1.25 or less on 90% or greater of Colorado Freight Corridor centerline miles"*.

Overall, PD 14 identifies specific performance measures associated with the Statewide Transportation Plan goals and objectives. PD 14 will be revised as needed, to update performance objectives and incorporate additional objectives and measures for goal areas such as freight, economic vitality, and environmental sustainability.

It is anticipated that additional freight-related goals, objectives, and targets/performance measures will be identified during the development of the Integrated Freight Plan, and future freight programs.

## PROMOTE VEHICLE EFFICIENCY

- **Primary Goal Area:** Sustainability and Environment
- **Summary:** Promote and disseminate information on policy strategies and programs to improve freight vehicle efficiency.

Significant fuel cost savings and emissions reduction benefits are attainable through the use of alternate fuel vehicles, retrofits to existing vehicles (i.e., CNG or electric), or aerodynamic improvements such as truck fairings.

CDOT will work with industry stakeholders, the Colorado Energy Office (CEO), and the Regional Air Quality Council (RAQC) to identify best practices, share information and resources, and promote the availability of funding for alternate fuel vehicles and efficiency improvements, as detailed in the 2040 Statewide Transportation Plan's strategic policy action for sustainability and the environment.

# CHAPTER IX: NEXT STEPS AND IMPLEMENTATION

## CHAPTER IX KEY POINTS

- This Plan will guide improvement of the overall effectiveness of the Colorado Freight System and help guide future investment decisions.
- This Plan was developed to position CDOT to become eligible for an increased federal share (from 82.79% up to 95%) for projects that improve freight movement. The increased federal share reduces the local match requirement for eligible projects, but does not increase the total amount of federal funding received by the state.
- The development of this Plan will be followed by a Phase II freight planning process to integrate planning for highway freight, rail freight, and aviation.
- A process and mechanism for reporting progress will be developed and used to communicate accomplishments with stakeholders and the public.

## PLAN IMPLEMENTATION

This Plan will guide improvement of the overall effectiveness of the Colorado Freight System, and support the vision of a safe, efficient, coordinated, and reliable system for the movement of freight. This Plan will help guide future investment decisions and position CDOT for dedicated funding opportunities by establishing its eligibility for an increase in the federal share payable to 95% for freight projects on the Interstate System and 90% for any other project that meets the requirements outlined in MAP-21 Section 1116.

This State Highway Freight Plan is part of the first phase of a two phase approach to freight planning. The second phase will include:

- Development of approach to integrate highway freight planning with freight rail and aviation planning
- Continued work with key stakeholders and planning partners to incorporate additional input, strategies, and develop an integrated implementation plan
- Re-establishment of industry engagement via the Freight Advisory Council (FAC) and expansion of membership to other key stakeholders and planning partners
- Development of freight strategies integrating highway freight, freight rail, and aviation

During the second phase, CDOT will work with the FAC, Statewide Transportation Advisory Committee (STAC), and Transit and Rail Advisory Committee (TRAC) to develop an Integrated Freight Plan. This Integrated Freight Plan will:

- Integrate the vision, goals, objectives, and strategies for highway freight, freight rail, and aviation
- Identify a plan for implementation, including the identification of champions, roles, and responsibilities for implementation activities
- Identify key undertakings of the FAC
- Establish priorities and a timeline (short and long-term) for completion of policy strategies and other implementation activities
- Establish a process for monitoring and reporting progress

## PLAN MONITORING

Monitoring of the State Highway Freight Plan will be an ongoing and continuous process to ensure the state moves efficiently and effectively towards meeting the goals and objectives outlined in this Plan. Monitoring will include not only the State Highway Freight Plan, but the Integrated Freight Plan once developed. This process will include various parts of CDOT, multiple regional and local planning partners, FHWA, other state and federal agencies, and the public. By monitoring and reporting progress, CDOT will also reveal successes and the potential need for adjustment in goals, objectives, or strategies.

A process and mechanism for reporting progress will be developed during the second phase of freight planning efforts, and used to communicate accomplishments with stakeholders and the public.

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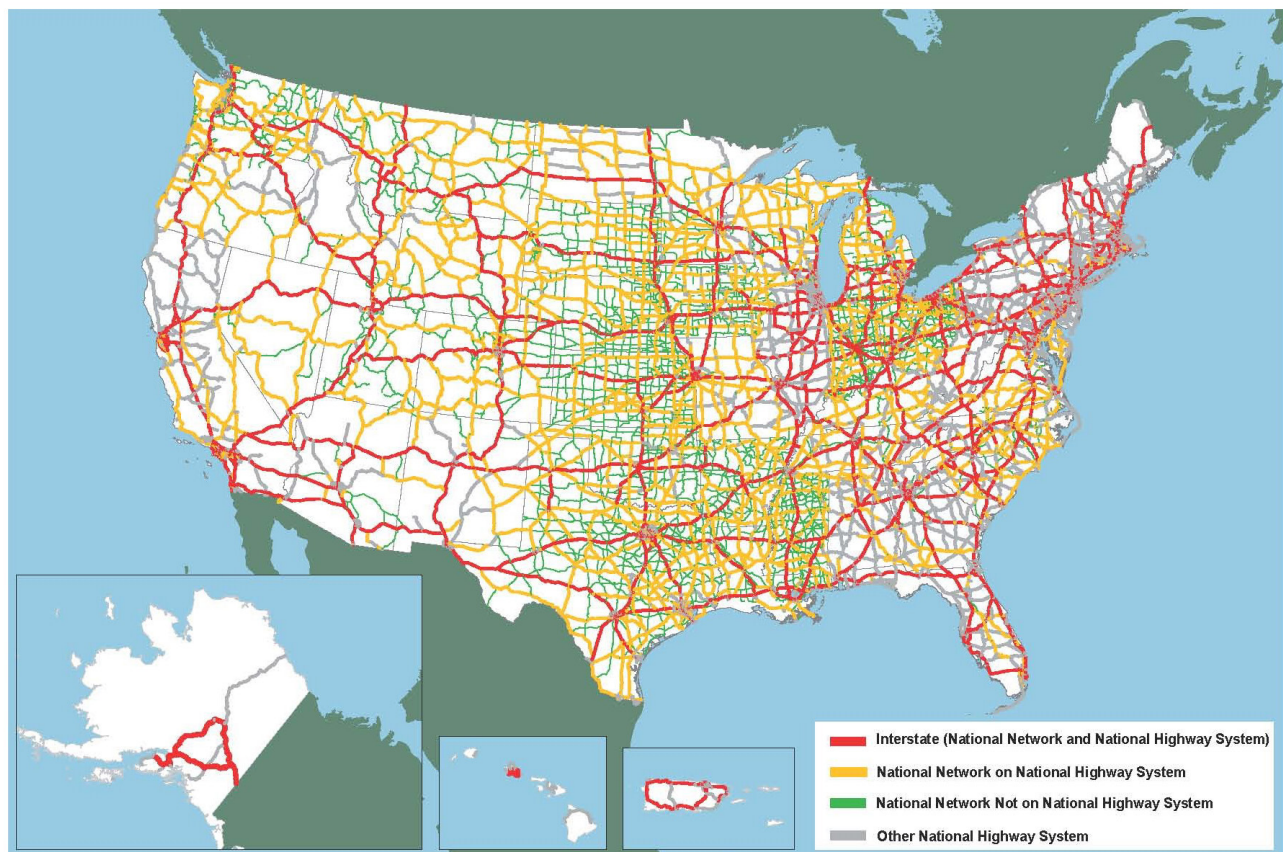
# APPENDIX A: NATIONAL FREIGHT DESIGNATIONS

For more than a quarter century, networks and corridors have been identified in transportation laws. These designations have had their own unique priorities, with a varying emphasis on freight movement. When addressing freight issues it is important to consider the practical, financial, and policy implications a route designation may have on a specific route, corridor, or project.

## NATIONAL NETWORK (NN)

The National Network (NN) was established by the Surface Transportation Assistance Act of 1982. The network identifies routes nationwide that meet the minimum geometric requirements to carry commercial vehicles - which meet standard dimensions and configuration - and consists of more than 200,000 miles. Although still in existence, in practice the NN was largely replaced by the National Highway System (NHS) when it was established in 1995. Colorado has not updated any routes since the National Network's inception in 1982.

National Network for Conventional Combination Trucks: 2009



Notes: This map should not be interpreted as the official National Network and should not be used for truck size and weight enforcement purposes. The National Network and the National Highway System (NHS) are approximately 200,000 miles in length, but the National Network includes 65,000 miles of highways beyond the NHS, and the NHS encompasses about 50,000 miles of highways that are not part of the National Network. "Other NHS" refers to NHS mileage that is not included on the National Network. Conventional combination trucks are tractors with one semitrailer up to 48 feet in length or with one 28-foot semitrailer and one 28-foot trailer. Conventional combination trucks can be up to 102 inches wide.  
Source: U.S. Department of Transportation, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 2.2, 2009.

Figure A-1: National Network for Conventional Combination Trucks: 2009

## NATIONAL HIGHWAY SYSTEM (NHS)

The National Highway System Designation Act of 1995 created a strategic highway system which focused on the nation's economy, defense, and mobility. NHS, unlike the NN, is not freight-specific, and gives preference to corridors for improvements, rather than just identifying those corridors that meet certain qualifications. The system is comprised of more than 160,000 miles of roadway nationally. A major update often referred to as expanded NHS was completed in 2013 as required by MAP-21. The original approved and expanded NHS system in Colorado includes 4,705 centerline miles on the State Highway System, and 192 of centerline miles off the State Highway System. See Figure 6 for a map of NHS facilities in Colorado.

# STRATEGIC HIGHWAY NETWORK

The Strategic Highway Network (STRAHNET) system, developed by the Federal Highway Administration (FHWA) and the Department of Defense (DOD), is a system of public highways which provides access, continuity, and emergency transportation of personnel and equipment to provide for national defense and security. There are seven active military installations in Colorado and many Colorado National Guard facilities. Fort Carson, located just south of Colorado Springs in El Paso County, is a major military deployment site. This facility has direct access to I-25/US Hwy 87, which is on the STRAHNET and the Colorado freight network. Buckley AFB, adjacent to Aurora is a prominent military installation, but is not a major deployment site. It is important for active military installations to maintain connectivity, inclusive of all transportation modes, to the STRAHNET and the Colorado freight network. The STRAHNET in Colorado includes 952 centerline miles on the Interstate Highway System, and 58 centerline miles of non-Interstate highway roadways.

## FEDERALLY DESIGNATED HIGH PRIORITY CORRIDORS

The Intermodal Surface Transportation Efficiency Act of 1991 established eighty priority corridors nationwide intended to promote collaborative planning along corridors. Four priority corridors are partially within Colorado. The Heartland Expressway between Denver and Rapid City, South Dakota, follows I-76 east from Denver to Brush, then SH 71 north to the Nebraska border. A spur runs south on SH 71 from Brush to Limon. The Camino Real Corridor from El Paso, Texas to the Canadian border in Montana follows I-25 through Colorado. The Port-to-Plains Corridor connects Laredo, Texas, to Denver. Beginning at the Oklahoma border, the corridor follows US 287 north to Limon and then continues west to Denver on I-70. The Route 50 High Plains Corridor follows US Route 50 from Newton, Kansas to Pueblo, Colorado.

These corridors did not receive funding under MAP-21, but under the three previous (ISTEA, TEA-21, and SAFETEA-LU) federal authorizations these corridors either directly or indirectly received funding. (Source: [http://www.fhwa.dot.gov/planning/national\\_highway\\_system/high\\_priority\\_corridors/](http://www.fhwa.dot.gov/planning/national_highway_system/high_priority_corridors/)).

## INTERMODAL CONNECTORS

NHS intermodal connectors are public roads leading to major intermodal terminals having a critical bearing on the efficient operation of that facility, where intermodal terminals are facilities which provide for the transfer of freight from one mode to another. (Source: [http://ops.fhwa.dot.gov/FREIGHT/freight\\_analysis/nhs\\_connectors/role\\_nhs\\_conn/role\\_sys\\_conn\\_2.htm](http://ops.fhwa.dot.gov/FREIGHT/freight_analysis/nhs_connectors/role_nhs_conn/role_sys_conn_2.htm)).

## NATIONAL FREIGHT NETWORK (NFN)

The National Freight Network, established in MAP-21, is being developed by the Federal Highway Administration (FHWA). The network will be comprised of three parts:

### PRIMARY FREIGHT NETWORK (PFN)

By law, this is to consist of no more than 27,000 miles of existing roadways nationwide with potentially 3,000 miles added for future needs. In February 2014, the Federal Highway Administration (FHWA) ended its comment period regarding development of the PFN. Based on comments received from organizations across the country, FHWA will review its approach to identifying the PFN.

### INTERSTATE HIGHWAYS

Any interstate highway that was not included in PFN.

### CRITICAL RURAL FREIGHT CORRIDORS (CRFC)

A state may designate a route as a CRFC if a corridor meets the following criteria identified in MAP-21:

- It is a rural Principal Arterial roadway and has a minimum of 25% of the Annual Average Daily Traffic (AADT) of the road measured in passenger vehicle equivalent units from trucks (FHWA vehicle classification scheme 8 to 13);
- It provides access to energy exploration, development, installation, or production areas;

- It connects the primary freight network or Interstate System to facilities that handle either the following volumes of commercial vehicles or commodity movement:
  - 50,000 20-foot equivalent units (TEU)\* per year; or
  - 500,000 tons per year of bulk commodities

\* A non-standardized unit roughly equivalent to 1/2 truck load by volume.

FHWA is currently developing rulemaking to allow states to identify CRFCs. CDOT has begun the initial analysis to determine what corridors meet the minimum criteria. Further action will be taken to designate the appropriate corridors when FHWA has established procedures.

Local municipalities, counties, or planning organizations may include other federal or state routes or local roadways important to freight movement in a particular geographic area in their respective local or regional transportation plans.

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# APPENDIX B: CDOT STUDIES RELATED TO THE FEDERALLY DESIGNATED HIGH PRIORITY CORRIDORS

## US 385 HIGH PLAINS CORRIDOR

July 2007 - Development and Management Plan - The High Plains Highway is a 222-mile corridor that begins near Kit Carson and ends at I-80 in Nebraska. It was identified as a corridor connector in the Eastern Colorado Mobility Study. The High Plains Highway Corridor Coalition (HPHC) - a formal association of towns and counties along the corridor - asked the Colorado Department of Transportation (CDOT) to assist the member communities in developing a plan for the corridor to anticipate and prioritize future corridor transportation needs. See the link to more information on this report at: [https://www.codot.gov/library/studies/385\\_final\\_web.pdf/view](https://www.codot.gov/library/studies/385_final_web.pdf/view). A project completed related to this study area includes the US 36/US 385 intersection improvement that occurred a couple of years ago. In addition, CDOT has programmed a project in the STIP FY2016 - 2019 to remove the 90 degree turns in Cheyenne Wells along US 385.

## EASTERN COLORADO MOBILITY STUDY

April 2002 - The Eastern Colorado Mobility Study was undertaken to assist the Transportation Commission of Colorado in making investment decisions regarding infrastructure improvements to enhance freight mobility in a large part of the state. The study area includes all of eastern Colorado, extending to the I-25 corridor on the west and Colorado's borders on the north, east and south. See the link to more information on this report at: <https://www.codot.gov/library/studies/EastCoMobilityStudy.pdf/view>. The recommendation in this study to create a Freight Advisory Council has been implemented, along with improvements along the Ports to Plains Corridor.

## PORTS TO PLAINS

February 2007 - This study was a joint effort by four state Departments of Transportation (DOTs) including Colorado, Texas, Oklahoma, and New Mexico. It includes I-70 from I-25 east to US 40/287 and then south along US 40/287 to the Colorado/Oklahoma border. The purpose was to create a Development and Management plan for the Ports to Plains Corridor, which outlines a proposed plan for the corridor and serves as an essential tool for securing federal funding for corridor development. It contains several elements that improve the transportation network's ability to move people and goods. Nearly 1,400 miles long, the corridor consists of 511 miles of 4- to 6-lane roadway, 755 miles of 2-lane roadway, and 113 miles of roadway in metropolitan areas. See the link to more information on this report at: <https://www.codot.gov/library/studies/ports2plains>. A recent improvement along this corridor includes the development of the two lane US 287 to a "Super Two" configuration with wider shoulders and more frequent passing lanes.

## US 287 AT LAMAR ENVIRONMENTAL ASSESSMENT AND FONSI

November 2014 - The Federal Highway Administration (FHWA), in cooperation with the Colorado Department of Transportation (CDOT), has prepared this Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) to identify and assess a new alignment for U.S. Highway (U.S.) 287 and U.S. 50 through the City of Lamar, Colorado in Prowers County. See the link to more information on this report at: <https://www.codot.gov/library/studies/us287-at-lamar-ea-fonsi>. Preliminary design has initiated with final design to occur over the next five years. Funds for construction have not yet been identified.

