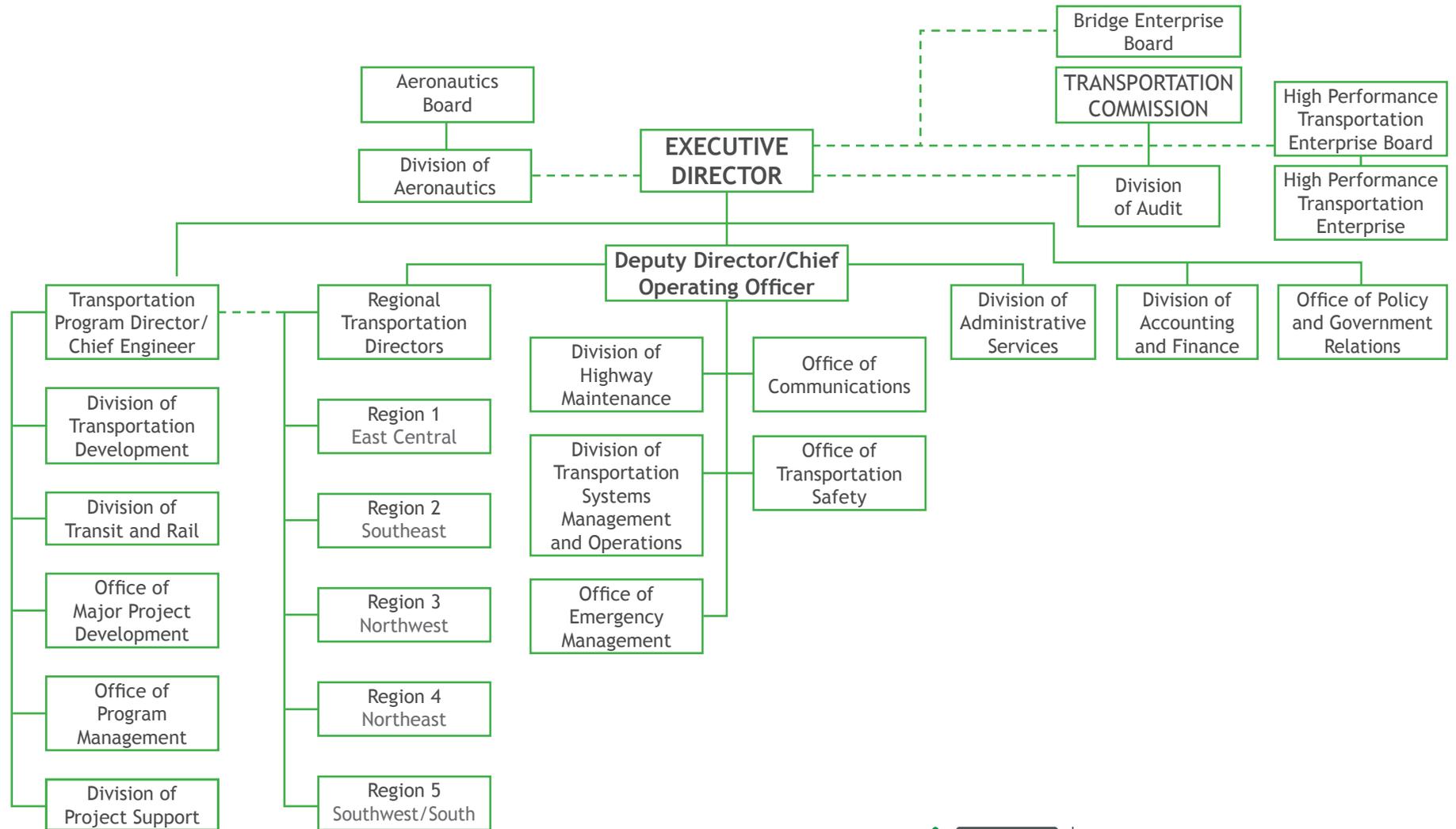


Organizational Chart

Updated December 2014





COLORADO

Department of
Transportation

State Highway Freight Plan

March 2015 STAC





State Highway Freight Plan

Proposed State Highway Freight Plan Development

- Phase I
 - Develop Plan to meet MAP-21 requirements and submit to FHWA in May 2015
- Phase II
 - Work with key stakeholders and planning partners to incorporate additional input, strategies, and develop implementation plan
 - Develop approach and strategies for integration with freight rail and aviation





State Highway Freight Plan

Why a State Highway Freight Plan?

- Comply with MAP-21 requirements
 - Increases federal share on certain freight projects
- Maintain movement of people and goods
- Support Economic Vitality





State Highway Freight Plan

MAP-21

- National Freight Policy Goals
- Freight Advisory Council (FAC) Roles
 - Advise State on Freight-related issues and priorities
 - Discuss decisions that affect Freight mobility
 - Communicate regional priorities
 - Collaborate between public and private sector
 - Participate in development of the Freight Plan
- Recommends development of a Freight Plan





State Highway Freight Plan – Phase I

Phase I

- Freight data collection
- Analysis of freight data
- Engaged industry to identify highway freight industry issues and needs
- Obtain and integrate information from the FAC, Statewide Plan, TSMO Plan, Strategic Highway Safety Plan, and STAC
- Develop Phase I MAP-21-compliant State Highway Freight Plan
- Submit Plan to FHWA in May 2015





State Highway Freight Plan – Phase II

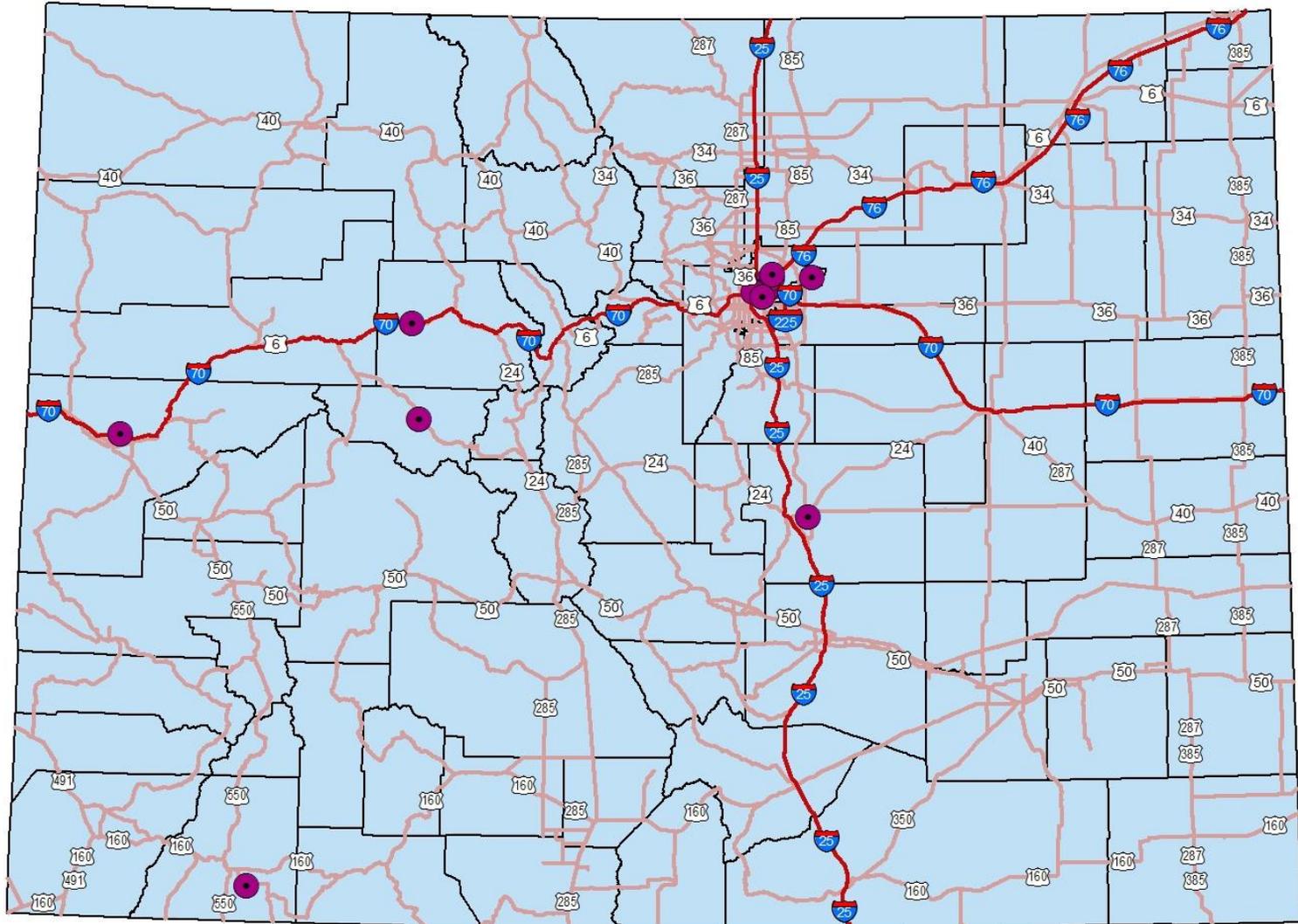
Phase II (Summer 2015)

- By this time, CDOT is anticipated to be positioned to become eligible for increased federal share of freight funding
- Establish an FAC for Phase II
- Establish coordination between FAC, STAC, and TRAC
- Integration with freight rail and aviation
- Building off of Phase I -
Incorporate Rail and Aviation –
all Freight modes in strategies





State Highway System and Intermodal Connectors



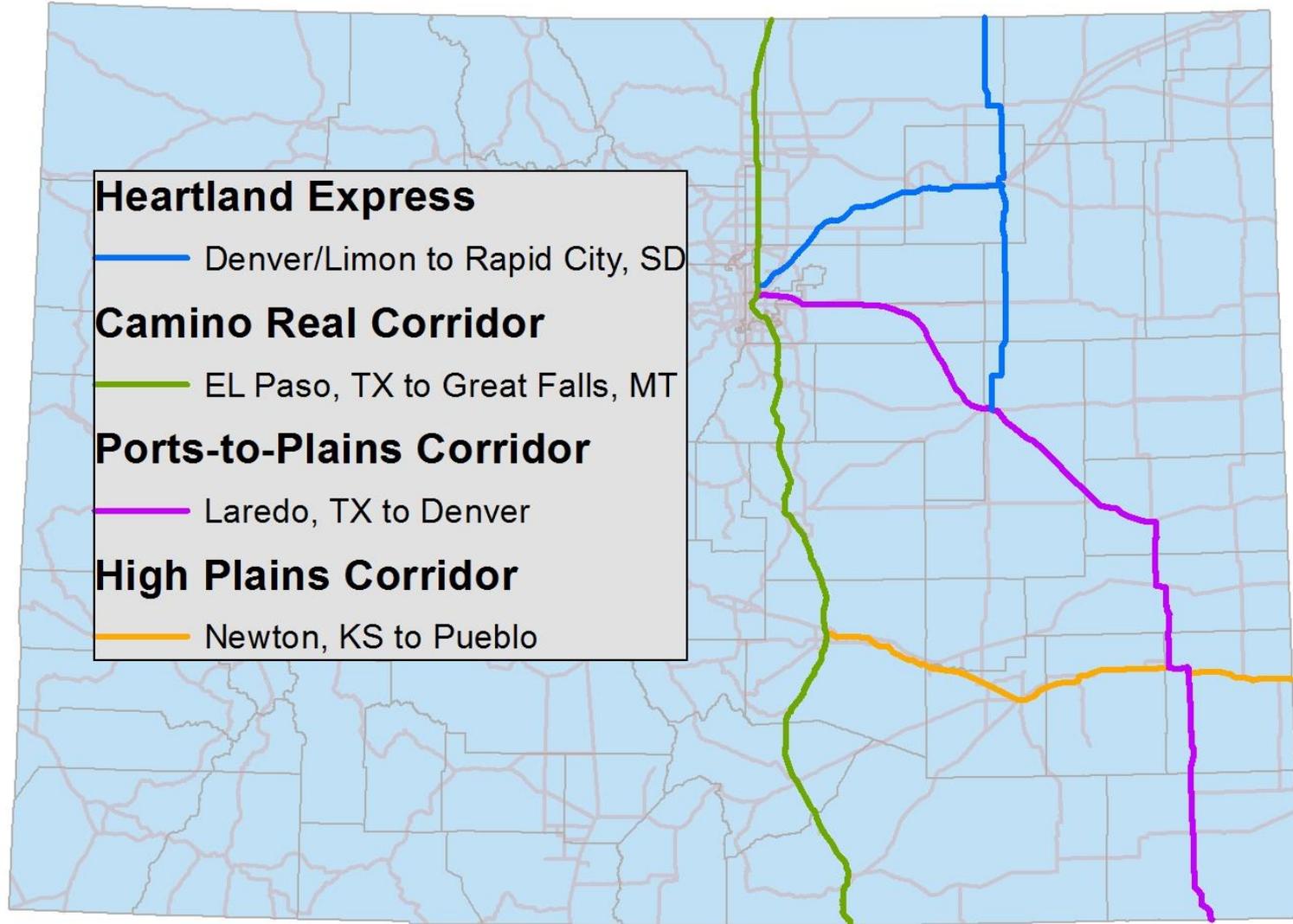


Intermodal Connectors

Facility	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
Walker Field, Grand Junction Airport	Airport

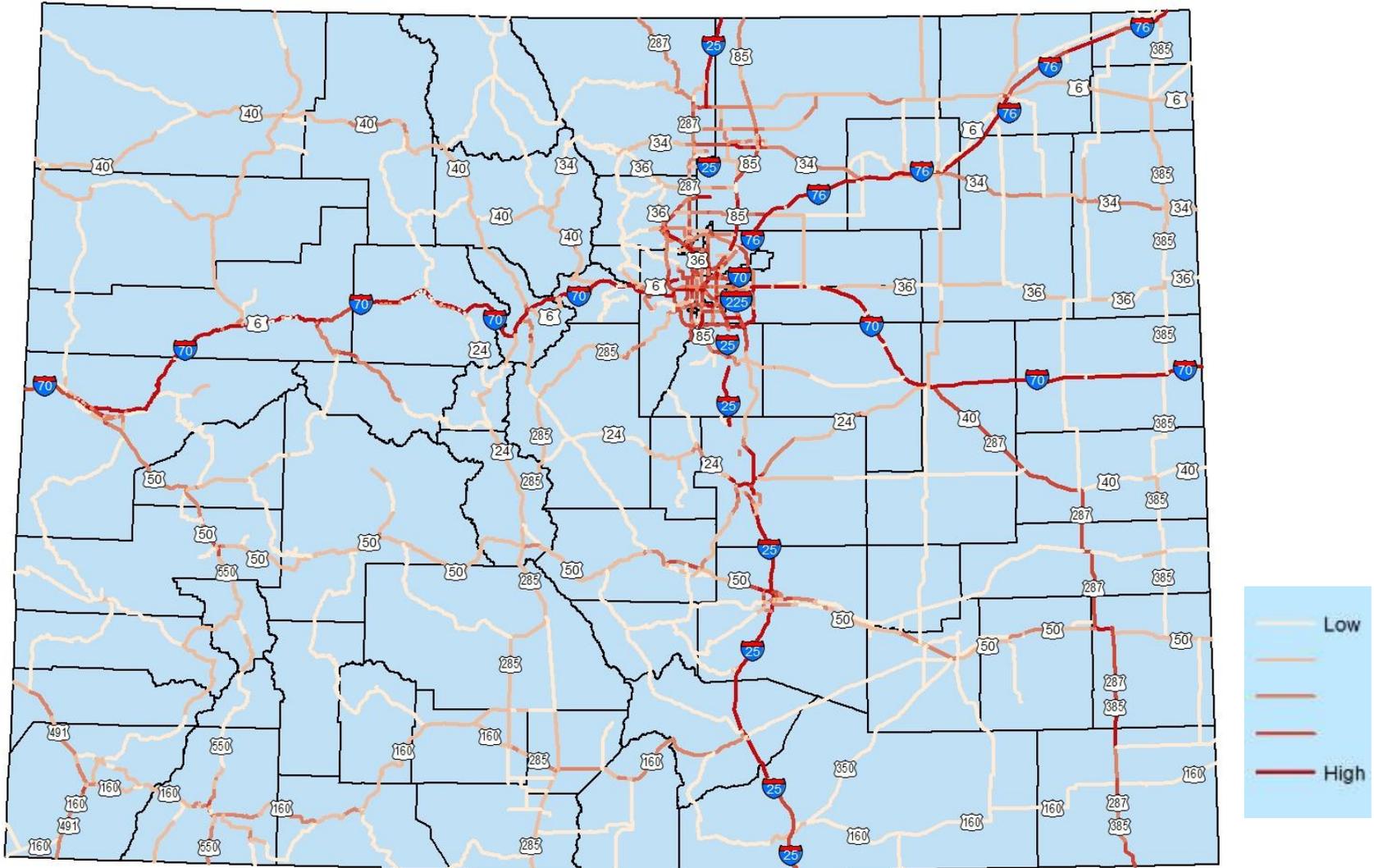


Federally Designated Corridors





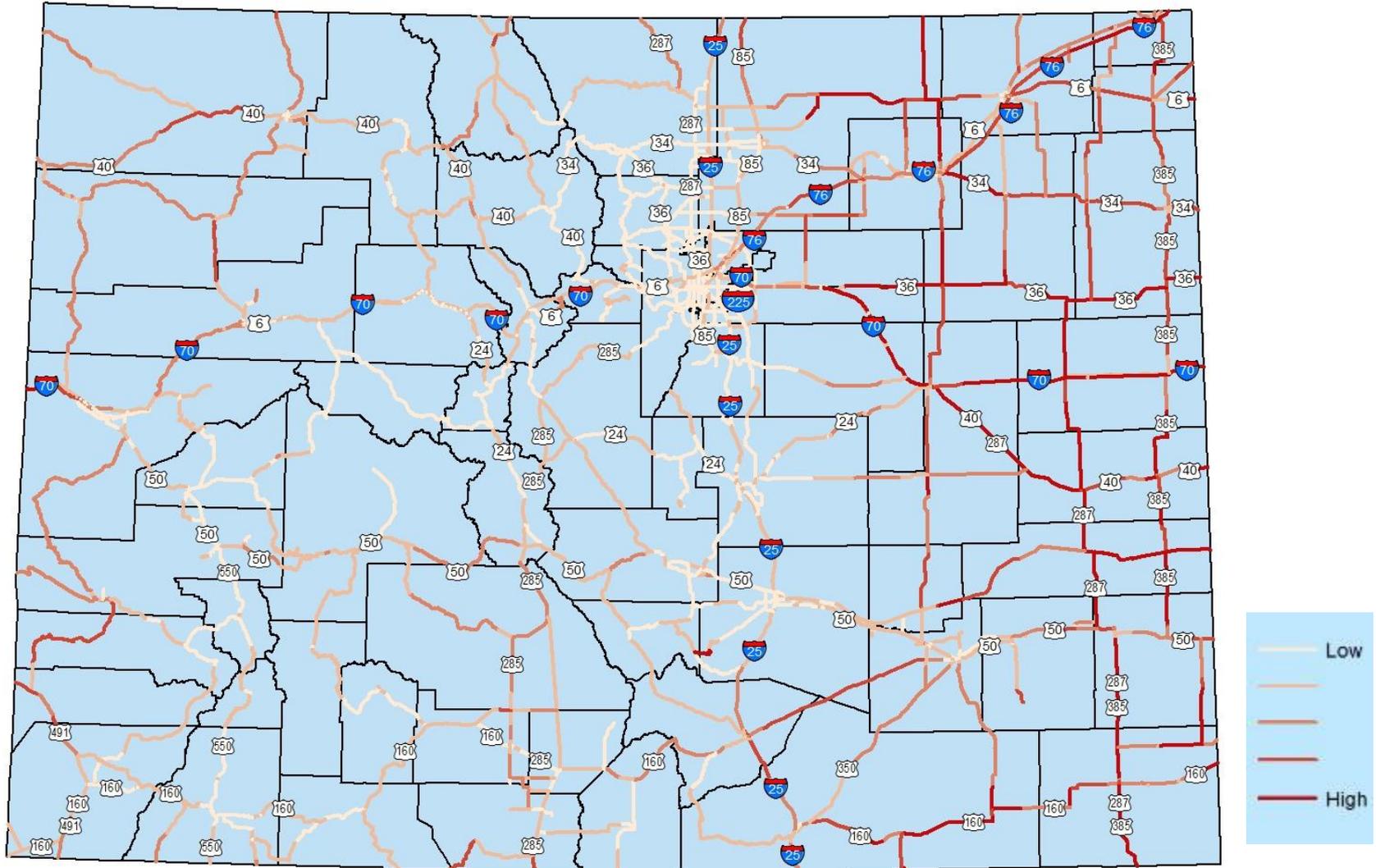
Truck AADT on State Highways (2012)



Source: CDOT, 2013.



Percent Truck on State Highways (2012)



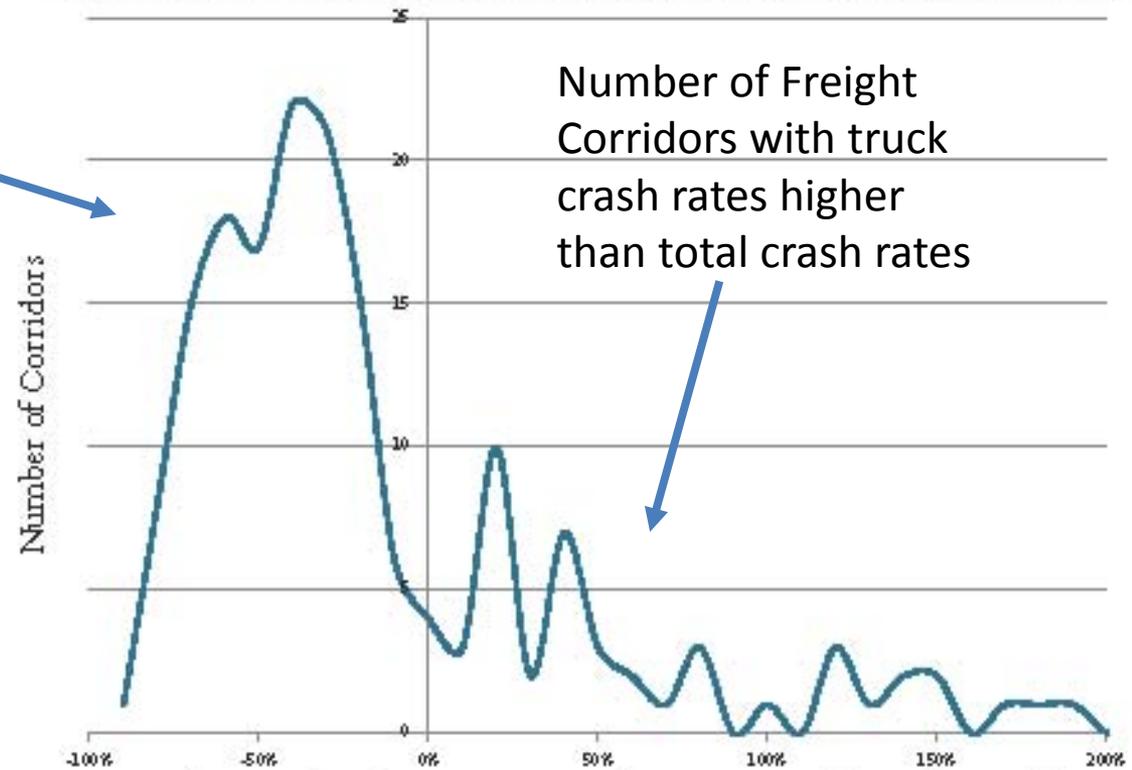
Source: CDOT, 2013.



Safety

Geographic Hotspots

Figure 6: Comparison of Crash Rates Between Trucks and All Vehicles, 2008-2012



Percent Difference of Crash Rates on 179 corridors comprising the Freight Corridors

Source: CDOT HQ Safety and Traffic Engineering Branch

Number of Freight Corridors with Truck crash rates lower than total crash rates

Potential Truck Safety Issues Contributing to Hotspots:

- Limited Turn Clearance
- Limited Line-of-Sight
- Geometric Deficiencies at Curves
- Low Vertical Clearance
- High Centering

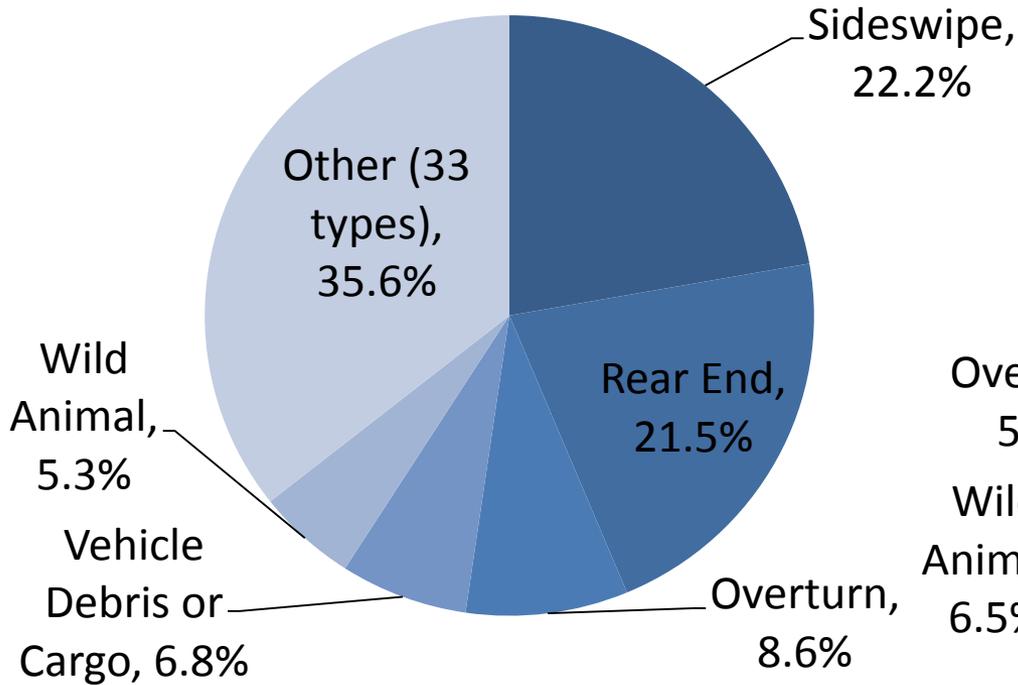
Source: CDOT Crash Data, 2013.



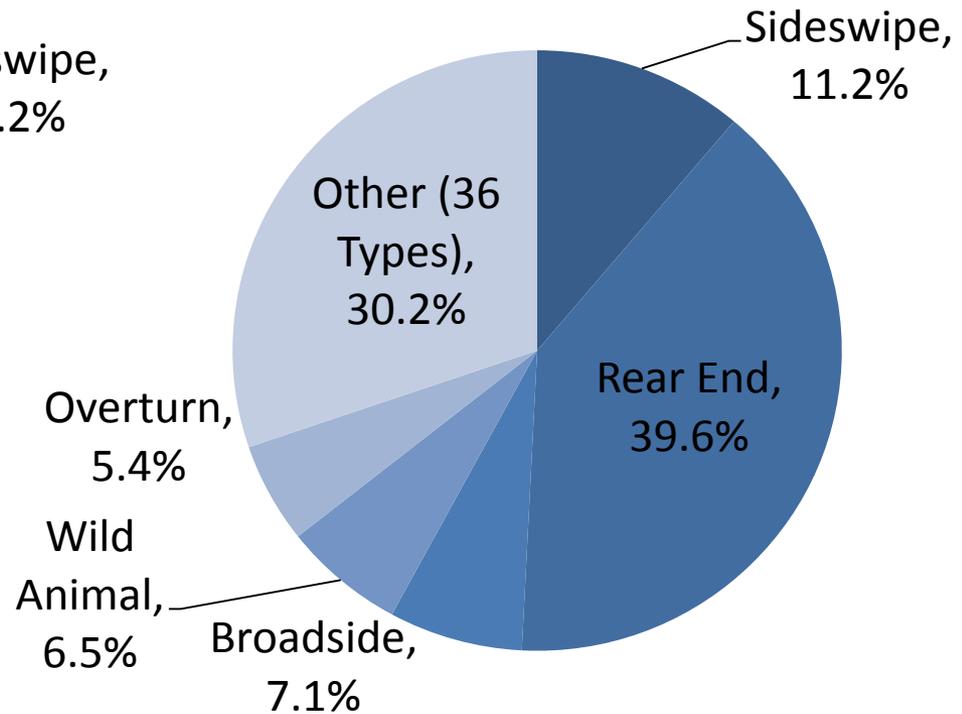
Safety

Crashes by Type

Truck Crash Type 2008 - 2012



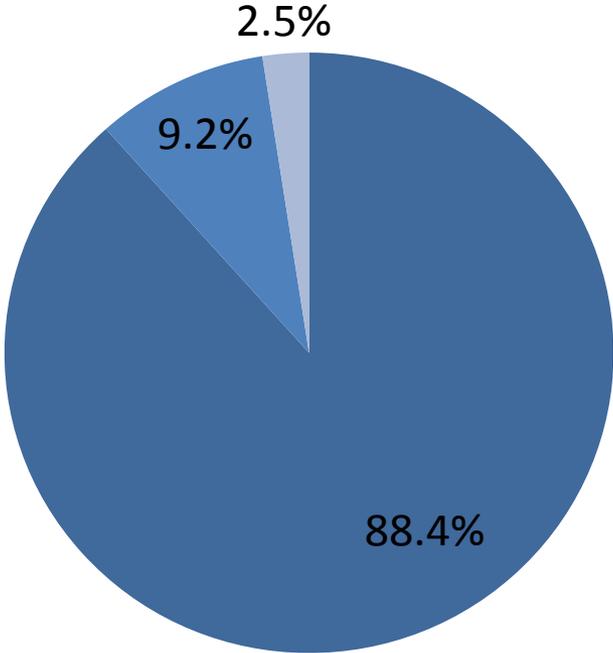
General Crash Type 2008 - 2012



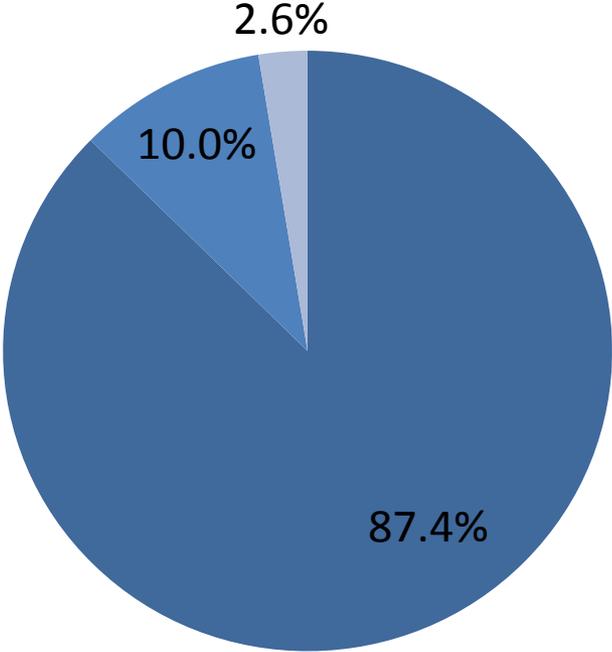


Infrastructure Condition - Bridge

Freight Corridors



State Highways



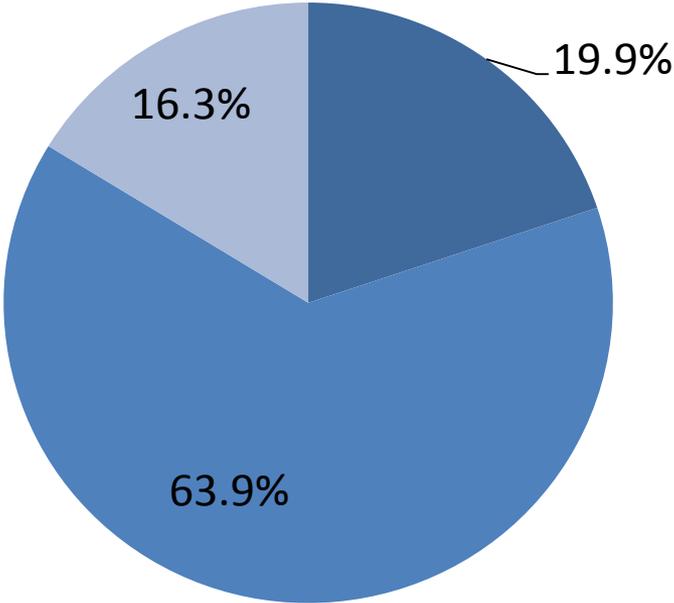
- Good
- Fair
- Poor

Source: CDOT, 2013.

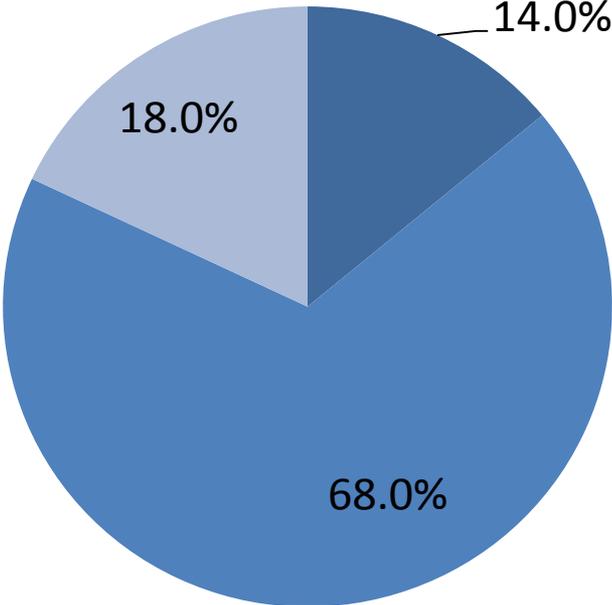


Infrastructure Condition - Pavement

Freight Corridors



State Highways



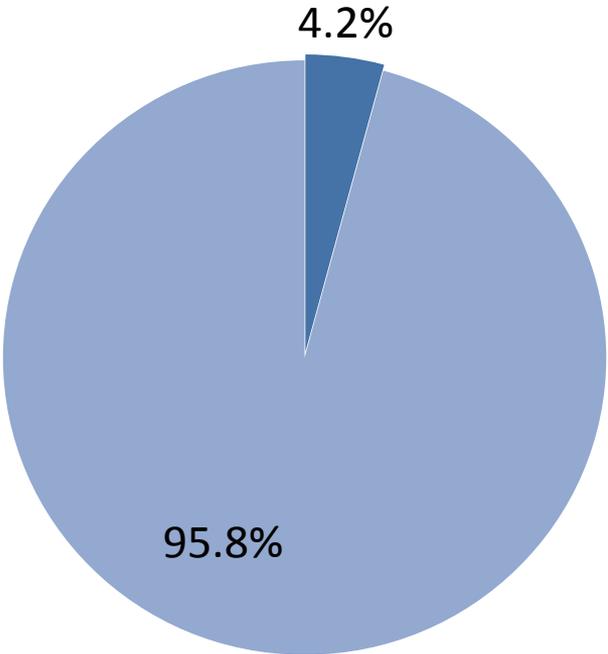
- High
- Moderate
- Low

Source: CDOT, 2013.

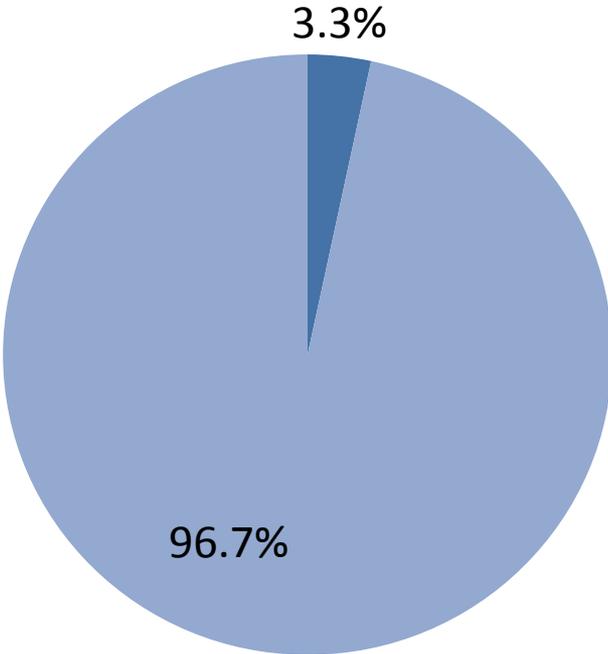


Mobility

Freight Corridors



State Highways



- Congested
- Non-congested

Source: CDOT, 2013.



Freight Trends - Commodities

Top Commodities by Weight

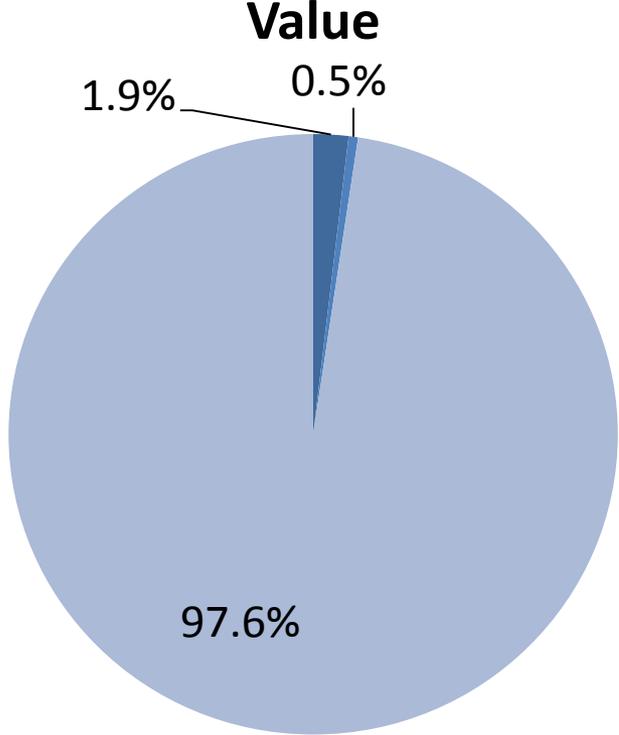
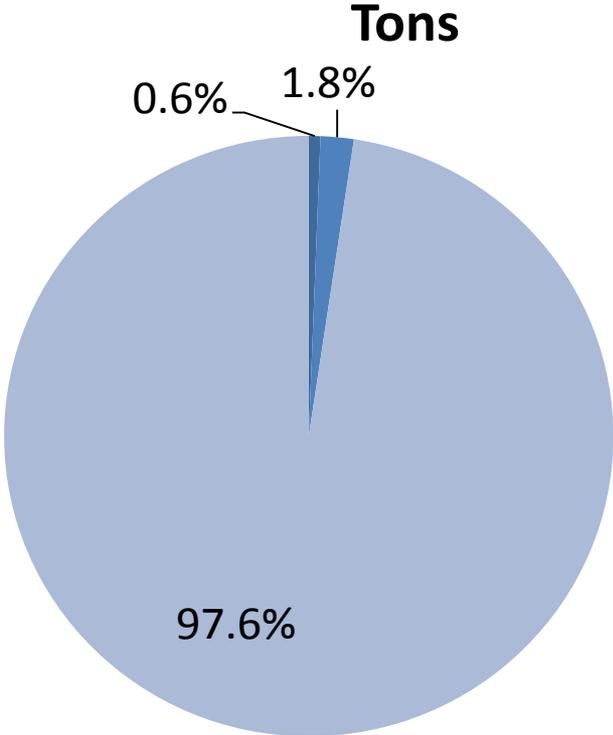
- Gravel or Sand
- Broken Stone or Riprap
- Ready-mix Concrete, wet
- Misc. Field Crops
- Grain

Top Commodities by Value (non-retail or supply chain)

- Misc. Field Crops
- Petroleum Refining Products
- Missile or Space Vehicle Parts
- Drugs
- Malt Liquors



Freight Movement by Mode - Exports

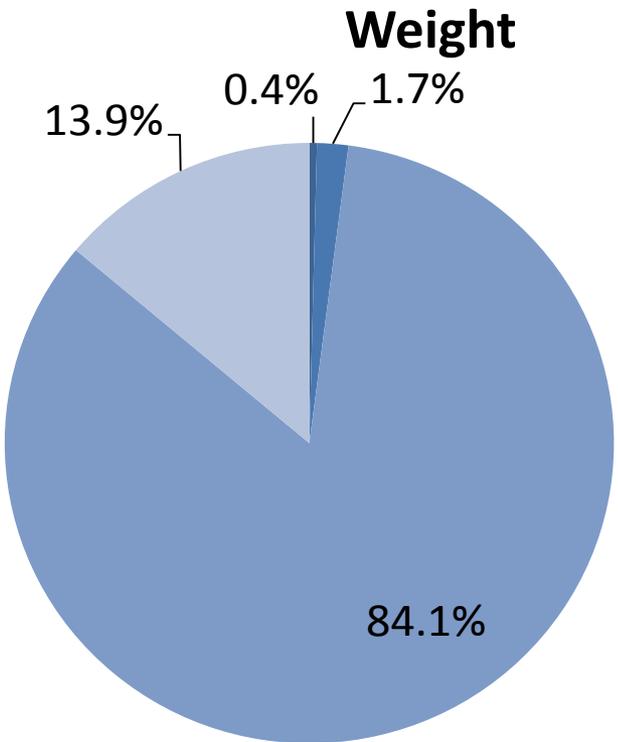


- Air
- Rail
- Truck

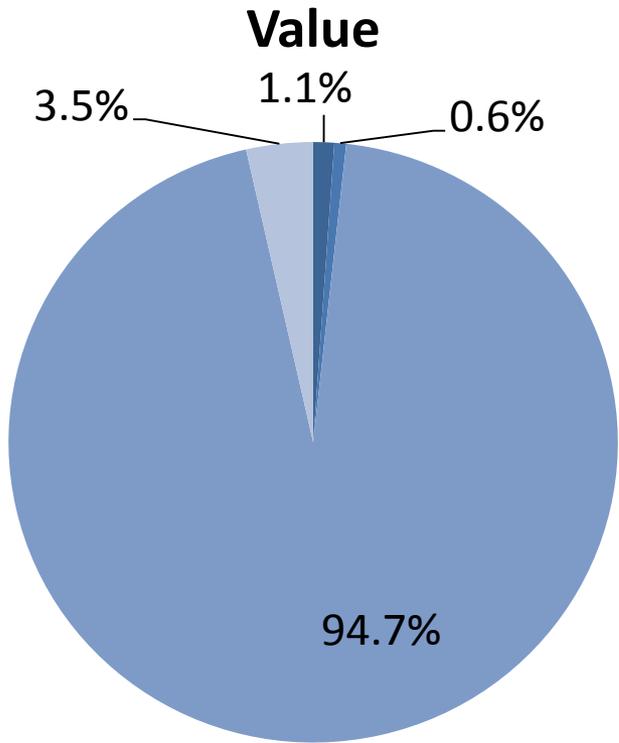
Source: IHS Global Insight, 2010.



Freight Movement by Mode - Imports



- Air
- Rail
- Truck
- Pipeline



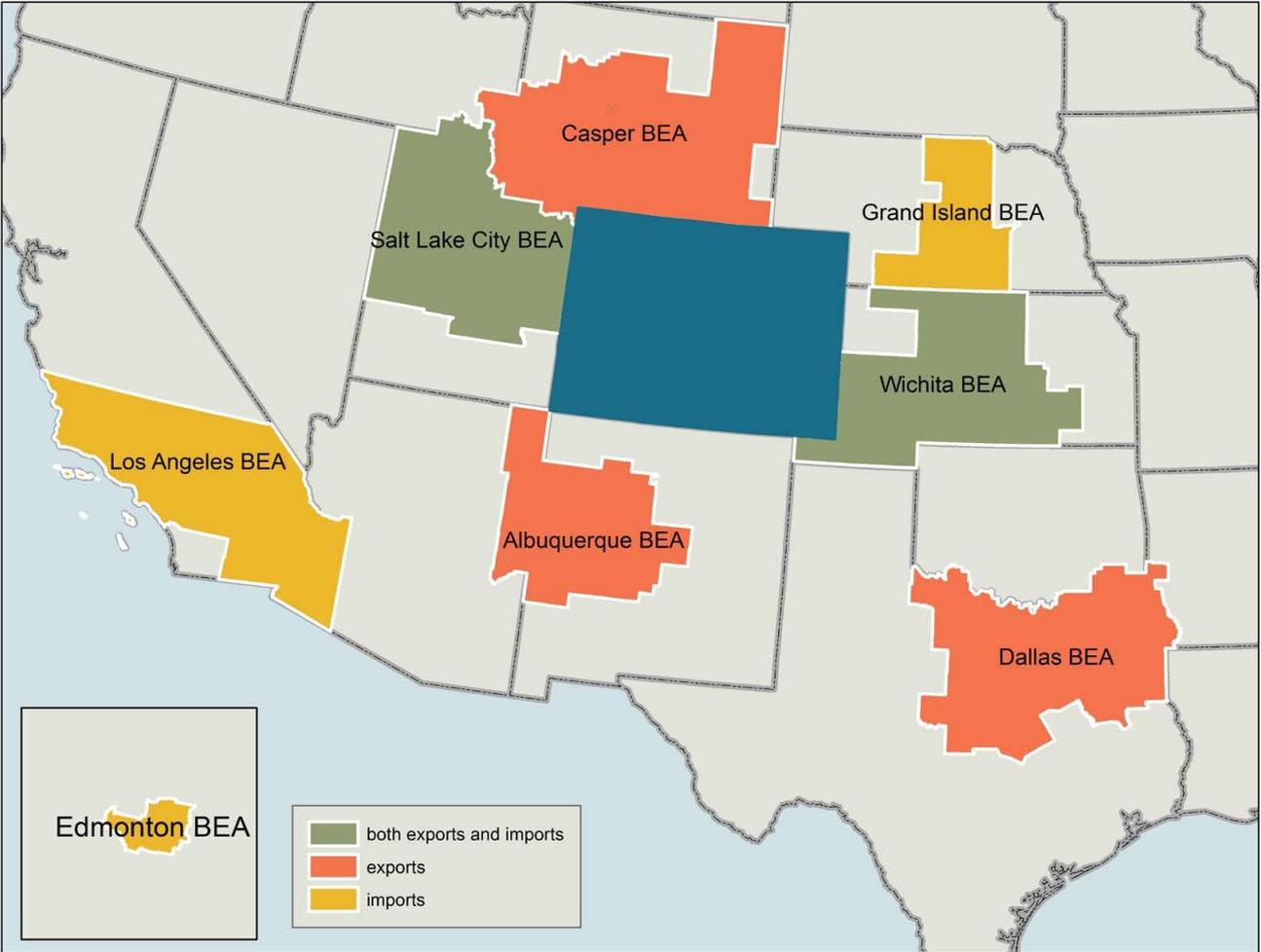
Source: IHS Global Insight, 2010.



Freight Trends – Trading Partners

Define BEA

Leading Trading Partners by Value in 2010

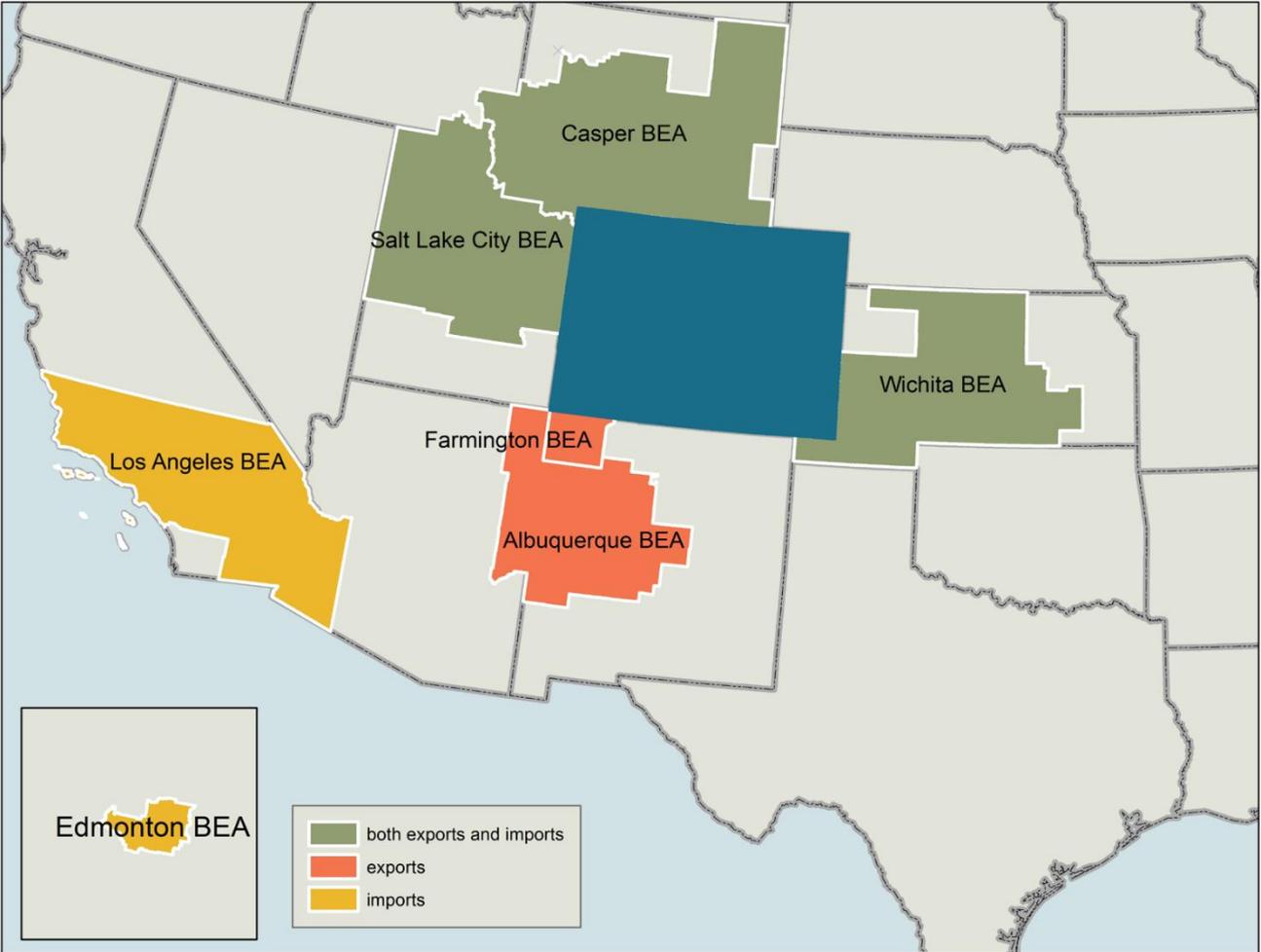


Source: IHS Global Insight, 2010.



Freight Trends – Trading Partners

Leading Trading Partners by Value in 2040

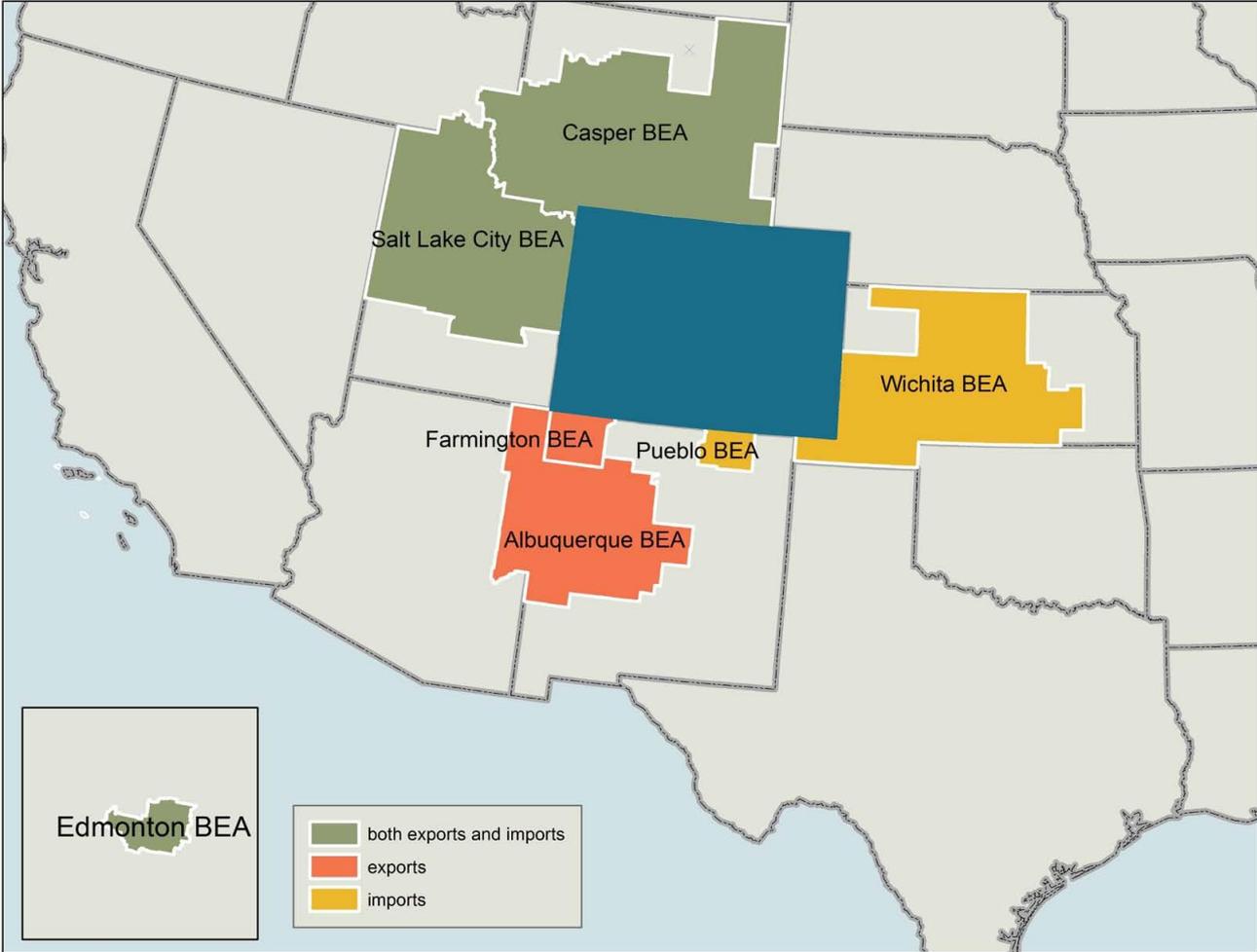


Source: IHS Global Insight, 2010.



Freight Trends – Trading Partners

Leading Trading Partners by Weight in 2010

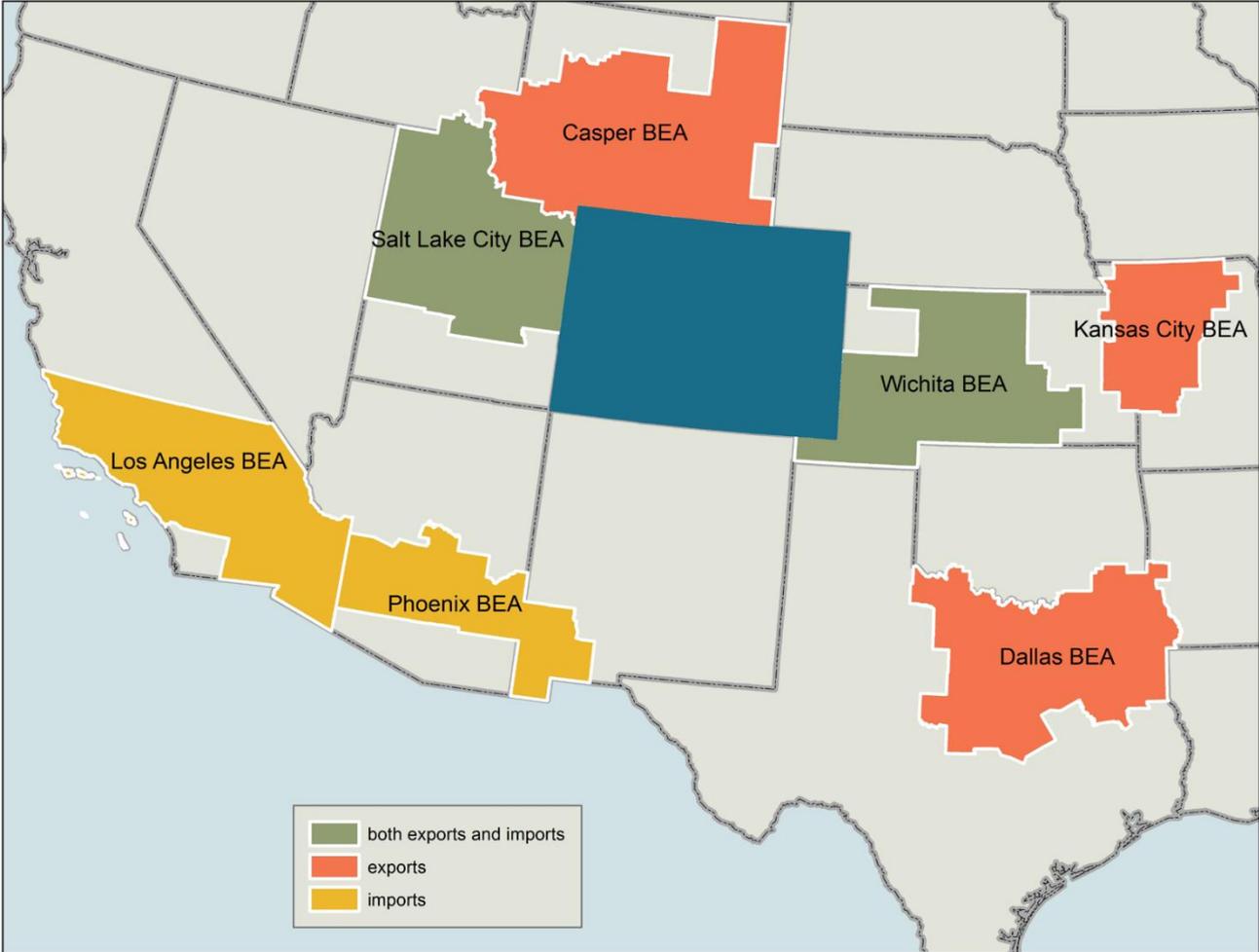


Source: IHS Global Insight, 2010.



Freight Trends – Trading Partners

Leading Trading Partners by Weight in 2040



Source: IHS Global Insight, 2010.



State Highway Freight Plan

Draft 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.





State Highway Freight Plan

Draft Goals are to improve:

- Safety of the Colorado state highway freight system
- Operational and system performance of the Colorado state highway freight system
- Economic vitality of the state through freight investments, programs and initiatives
- Infrastructure condition of the Colorado state highway freight system
- The environment by reducing the environmental impacts of freight movement





Timeline

- **April 2015** – Freight Workshop (at STAC Meeting)
 - Provide Draft Plan to STAC on April 10 for review & comment
 - STAC to provide input on Draft Plan
- **May 2015**
 - Submit Phase I State Highway Freight Plan to FHWA
 - Discuss STAC participation in Phase II (at STAC Meeting)
- **Summer 2015** – STAC, TRAC, and FAC meetings on freight including Phase II of State Highway Freight Plan, integration with aviation and freight rail.

State Highway Freight Plan Development Timeline





Questions / Comments?





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Oil & Gas Impacts on Transportation Update

Statewide Transportation Advisory Committee

March 27, 2015



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Transportation

Today's Discussion

- Overview of Impact Methodology
- Study Questions 1 and 2: Analysis and Preliminary Results
- Next Steps



Key Questions in Determining Impacts

Today's
Discussion

- How much of the truck traffic on the state highway system in 2013 was related to the oil and gas industry?
- What portion of the loads (in terms of Equivalent Single Axle Load - ESALs) on the state highway system 2013 was related to the oil and gas industry?

April's
Discussion

- What are the estimated costs to offset the oil and gas industry impacts in 2013 and how do they compare to CDOT annual budget?
- What are the estimated costs on a per-mile basis to offset the oil and gas industry impacts?



Methodology to Quantify Impacts

- Isolate the damage to road surface caused by oil and gas industry
- Calculate cost to offset incremental impacts
- **Asphalt roads:**
 - Pavement overlay depth required
- **Concrete roads:**
 - Proportion of reconstruction cost



Magnitude of Impacts on CDOT's System

- **Approach:**
 - Use actual drilling and production data from 2013
 - Use methodology established in research study where applicable
- **Research Study application:**
 - Trip generation and truck typology
 - Cost estimation methodology
- **Generalizations and Assumptions:**
 - Trip length (assume average of 5 and 15 miles)
 - Road characteristics (use average conditions)



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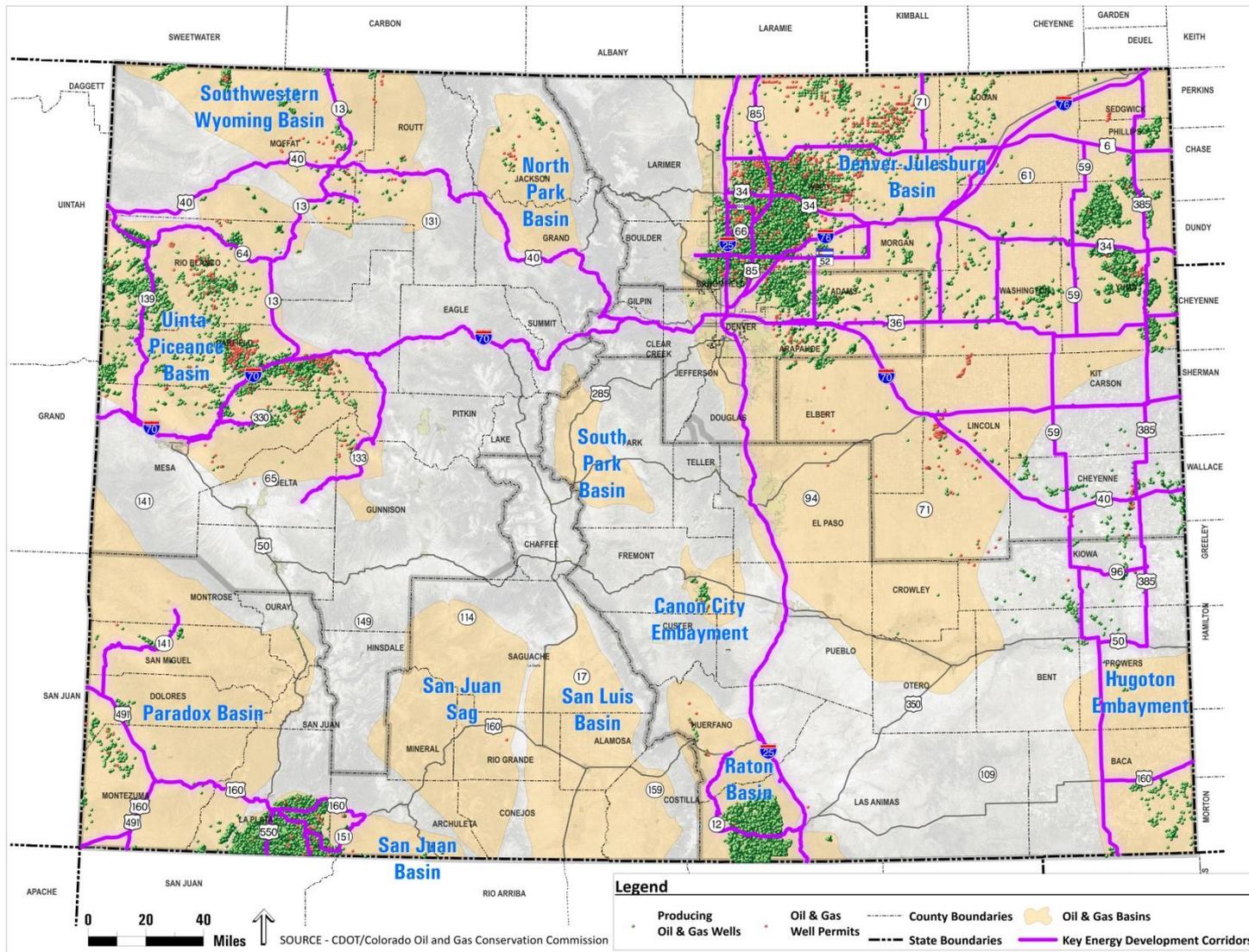
Department of
Transportation

Data and Analysis

- Drivability Life of Key Energy Corridors
- Colorado's Oil and Gas Rigs
- Producing Wells and Well Permits
- Oil and Gas Trends
- Trip Generation, Vehicle Types and Heavy Vehicle Impacts

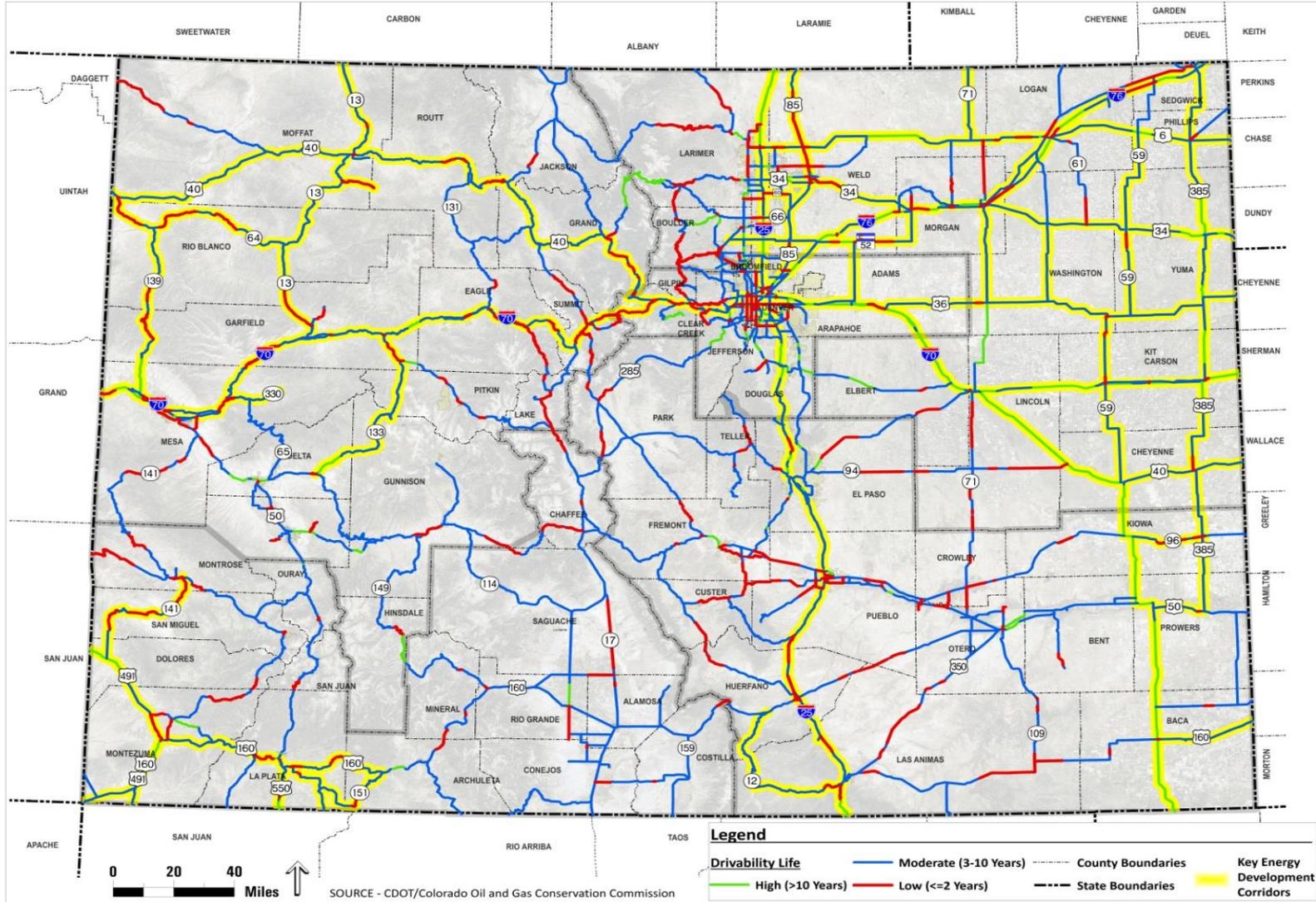


Key Energy Corridors



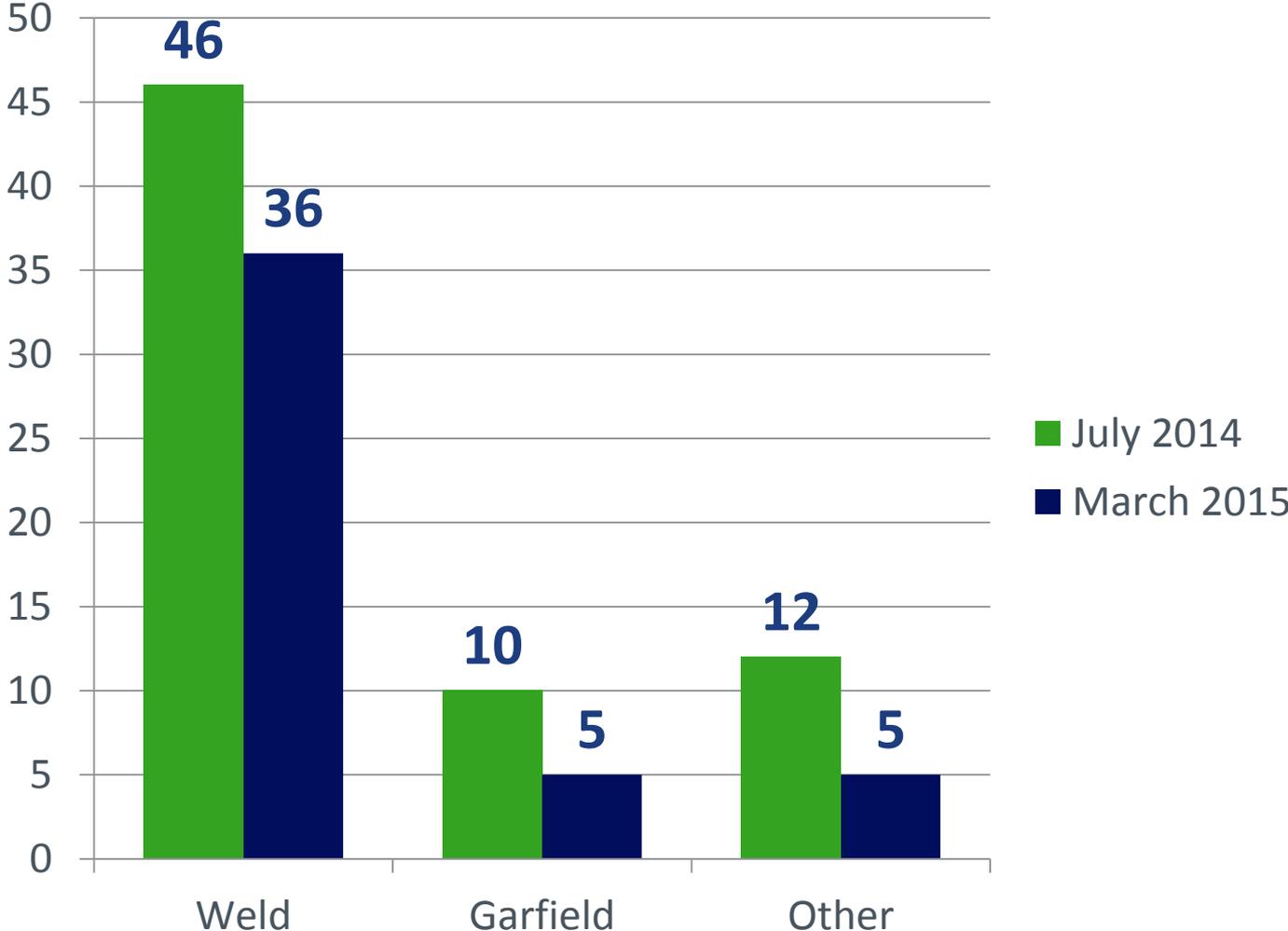


Drivability Life of Key Energy Corridors





Active Rigs in Colorado

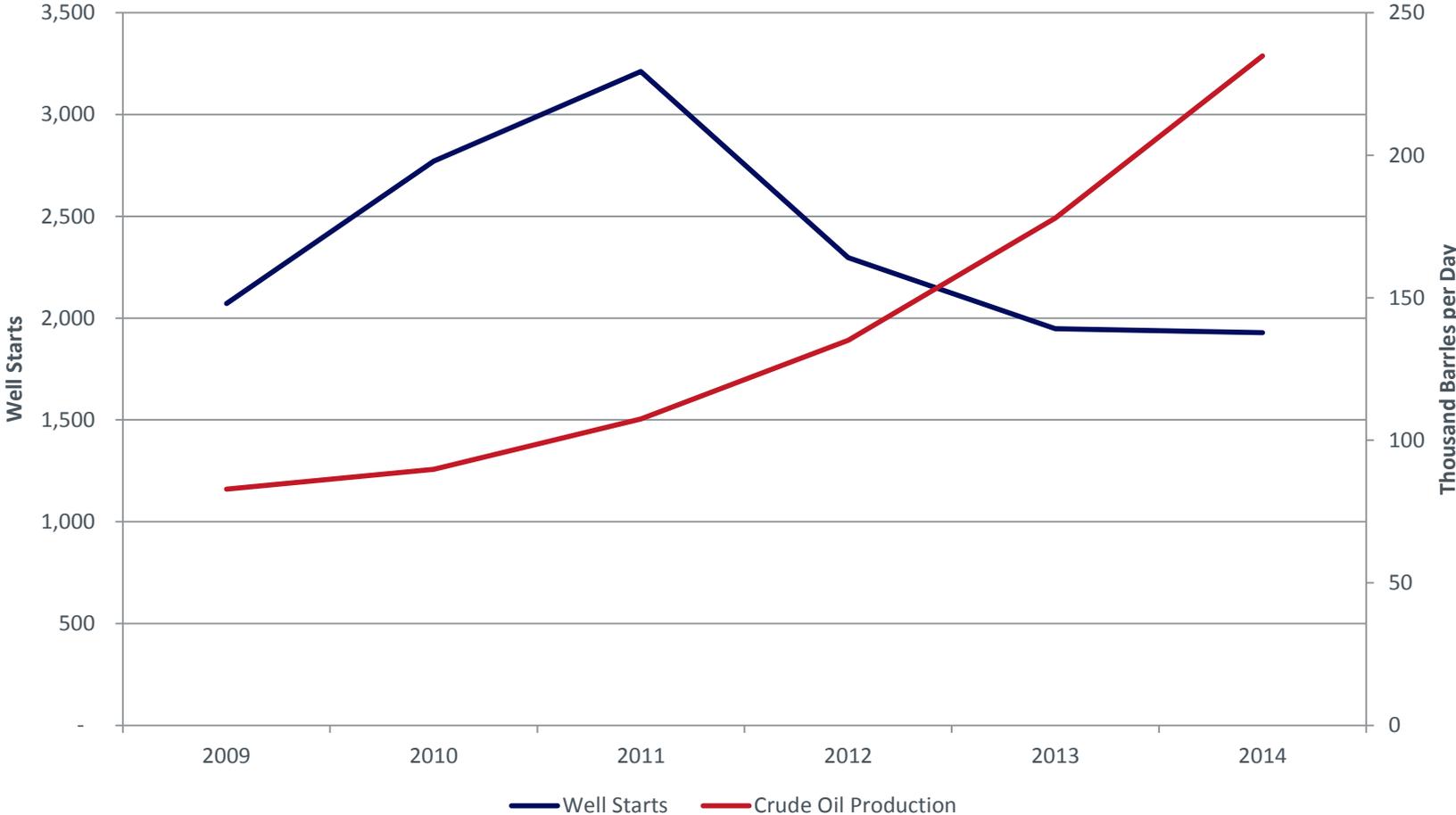


Source: Colorado Oil and Gas Conservation Commission



Oil and Gas Development Trends

Well Starts and Crude Oil Production (2009-2014)



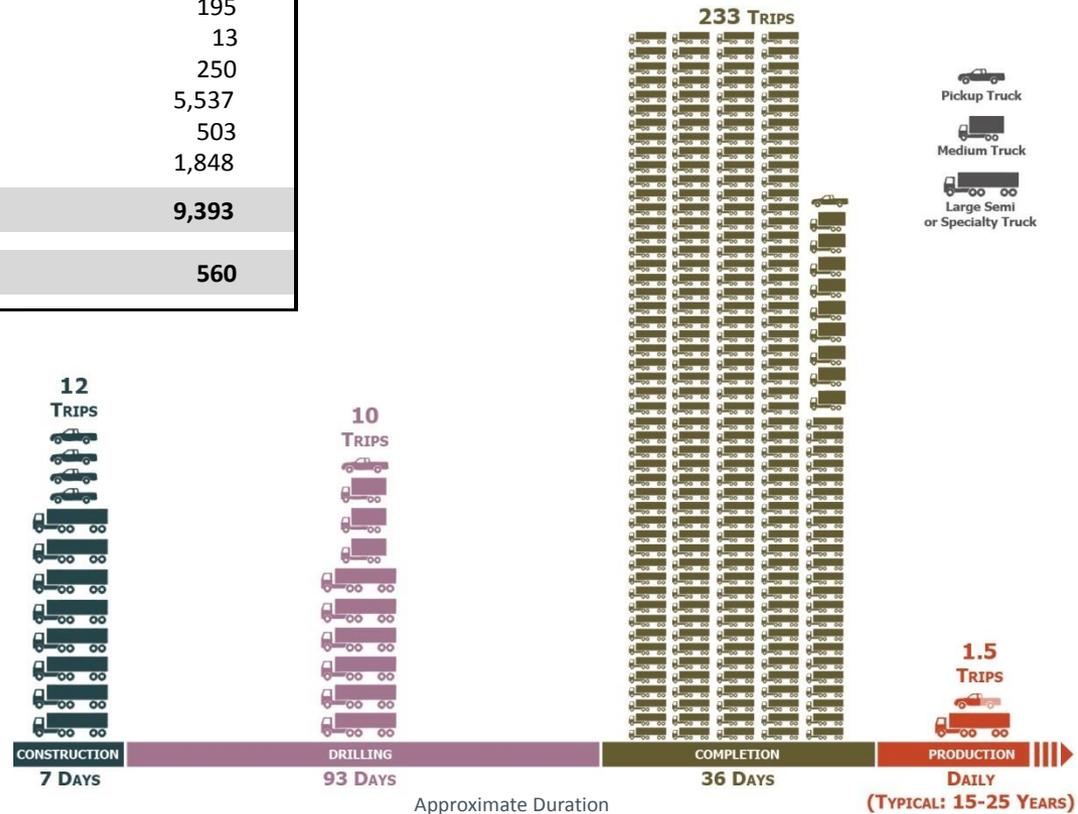
Source: Colorado Oil and Gas Conservation Commission



Trip Generation and Vehicle Types

Phase		Truck Trips 1 pad, 6 wells
Construction	Pad and Road Construction	87
	Drilling	
	Drilling Rig	67
	Drilling Fluid and Materials	472
	Drilling Equipment (casing, drill pipe, etc)	389
Completion	Completion Rig	33
	Completion Fluid and Materials	195
	Completion Equipment (pipe, wellhead, etc)	13
	Fracturing Equipment (pump trucks, tanks, etc)	250
	Fracture Water	5,537
	Fracture Sand	503
	Flowback Water Disposal	1,848
Total Development Trips		9,393
Annual Production Trips Per Pad		560

Average Daily Trips





Trip Reduction from Pipelines

In Weld County, approximately **60%** of new wells use pipelines to transport water

Phase		Truck Trips 1 pad, 6 wells
Construction	Pad and Road Construction	87
	Drilling	
	Drilling Rig	67
	Drilling Fluid and Materials	472
	Drilling Equipment (casing, drill pipe, etc)	389
Completion	Completion Rig	33
	Completion Fluid and Materials	195
	Completion Equipment (pipe, wellhead, etc)	13
	Fracturing Equipment (pump trucks, tanks, etc)	250
	<u>Fracture Water</u>	5,537
	<u>Fracture Sand</u>	503
	<u>Flowback Water Disposal</u>	1,848
Total Development Trips		9,393
Annual Production Trips Per Pad		560

Transported by pipeline

2,008 total trips



Heavy Vehicle Impacts

- Equivalent Single Axle Load (ESAL) - used to compare the effects of vehicles carrying different loads
- Passenger car ESAL = 0.0004
- Loaded water truck ESAL = 1.4 - 5.6
 - 3,500 - 14,000 times the load impact of a passenger car
- Rig derrick truck ESAL = 8.5 - 18.5
 - 21,000 - 46,000 times the load impact of a passenger car



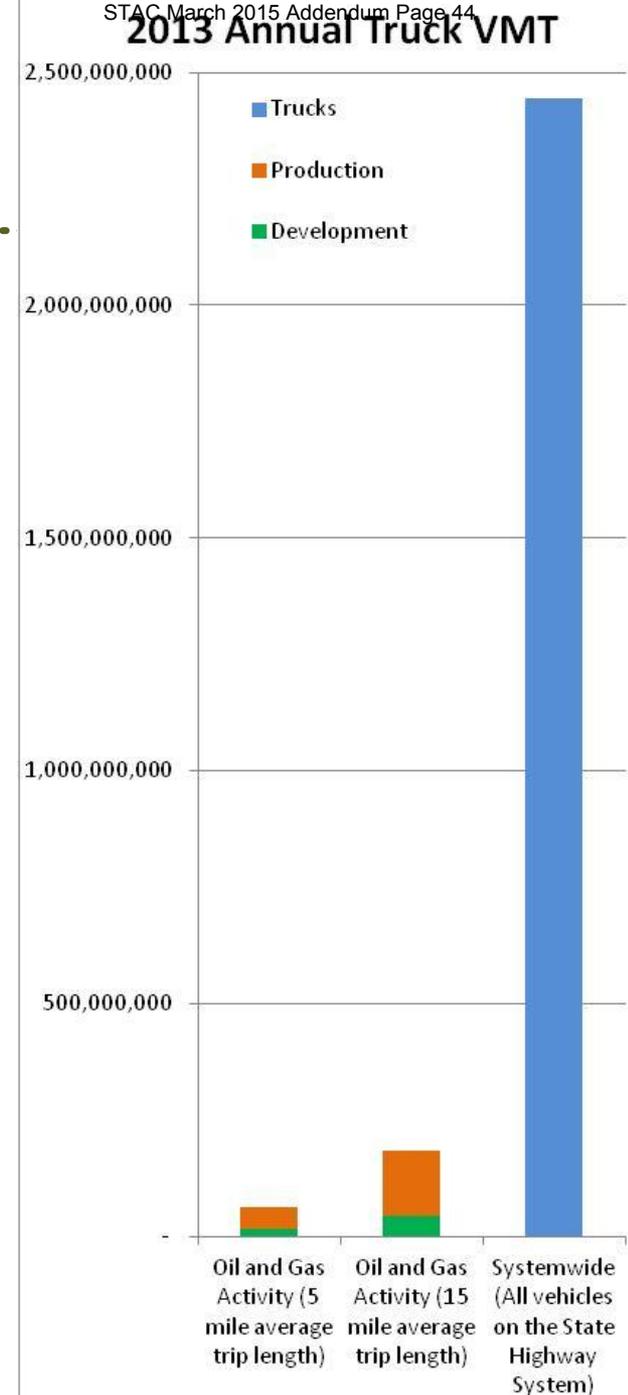


Industry's Portion of SH Truck Traffic

- Q1: How much of the truck traffic on the state highway system in 2013 was related to the oil and gas industry?

Oil and gas vehicle miles traveled (VMT) could account for **2.5 – 7.5 percent** of the system wide truck VMT.

- Development phase: 0.5 – 2 percent (Truck VMT)
- Production phase: 2 – 5.5 percent (Note: very conservative)



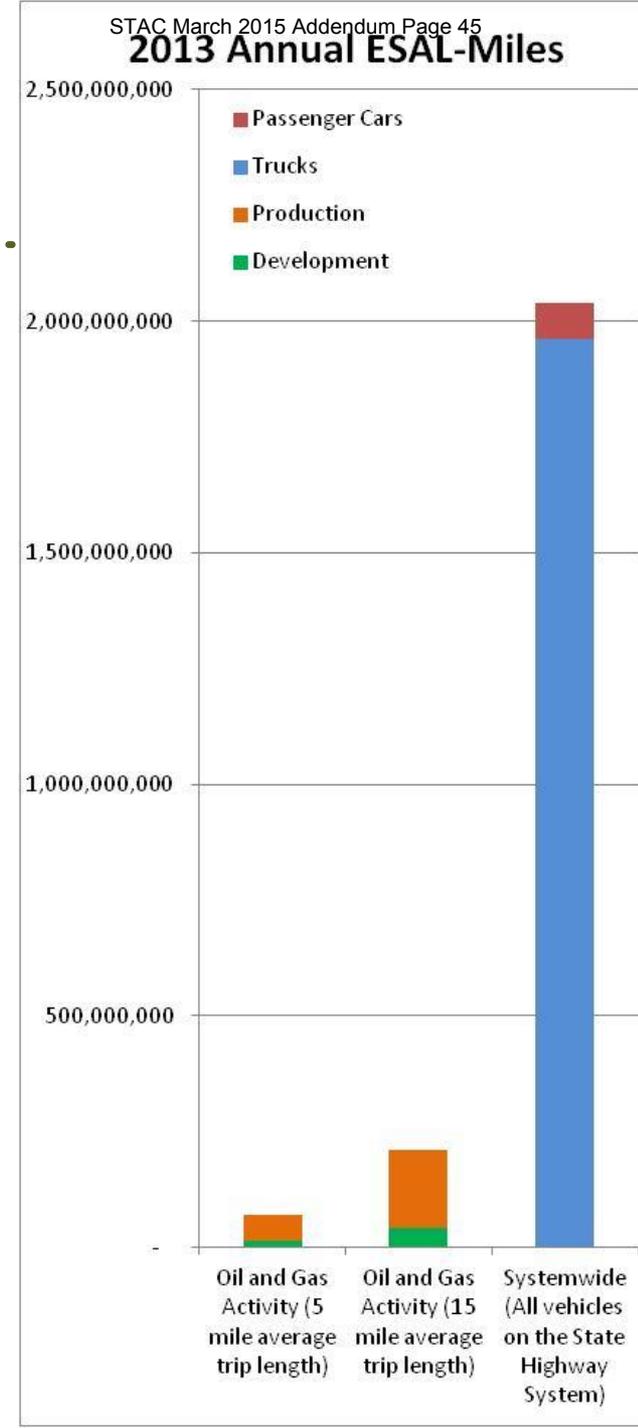


Industry's Portion of ESAL miles

- Q2: What portion of the loads (in terms of ESALs) on the state highway system in 2013 was related to the oil and gas industry?

Oil and gas ESAL-miles traveled is estimated to be **3 – 10 percent** of the system wide ESAL-miles

- Development phase: 0.5 – 2 percent
- Production phase: 2.5 – 8 percent (note: very conservative)





Oil and Gas Impacts Calculator

- Development of 8 wells on 1 pad adjacent to SH 14 near New Raymer, Colorado
- Calculate cost to recover impacts on 1 mile of SH 14

CDOT Oil & Gas Impacts Calculator

Created by Felsburg Holt & Ullevig for exclusive use by CDOT

DRAFT

v1.2 Last updated on 3/2/2015

Roadway Information

SEGMENT: 1

Q1. Name of the roadway:	SH 14
Q2. Start Mile Post:	191.000
Q3. End Mile Post:	192.000
Q4. CDOT Region:	R4
Q5. Functional Class:	Principal Arterial - Others
Q6. Urban or Rural?:	Rural
Q7. Mountains or Plains?:	Plains
Q8. Segment Length (miles):	1.000 mi
Q9. Surface Type:	Asphalt
Q10. Paved Width (feet, total of both directions):	36 ft
Q11. # of Through Lanes (total of both directions):	2
Q12. Drivability Life (years remaining):	13 years

Add Segment



Oil and Gas Impacts Calculator

- Development of 8 wells on 1 pad adjacent to SH 14 near New Raymer, Colorado
- Calculate cost to recover impacts on 1 mile of SH 14

CDOT Oil & Gas Impacts Calculator - Impact Report

Created by Felsburg Holt & Ullevig for exclusive use by CDOT

DRAFT

v1.1 Last updated on 2/13/2015

Roadway Impacts

ID	Name	Start MP	End MP	Length	Surface	Development Costs (\$2014)	Future Pad(s) Production Costs (\$2014)/Year	Existing Pad(s) Production Costs (\$2014)/Year
1	SH 14	191.000	192.000	1.000	Asphalt	\$ 11,400.00	\$ 700.00	\$ -
TOTAL:				1.000		\$ 11,400.00	\$ 700.00	\$ -
						Total over years of production:	\$ 14,000.00	\$ -
<i>Total additional roadway costs over life of pad(s):</i>				\$	25,400.00	(\$2014)		



Next Steps

- April STAC meeting
 - Study Questions 3 and 4: Analysis and Preliminary Results
 - STAC Input



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Questions?



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FY 16-19 Draft STIP

March 2015

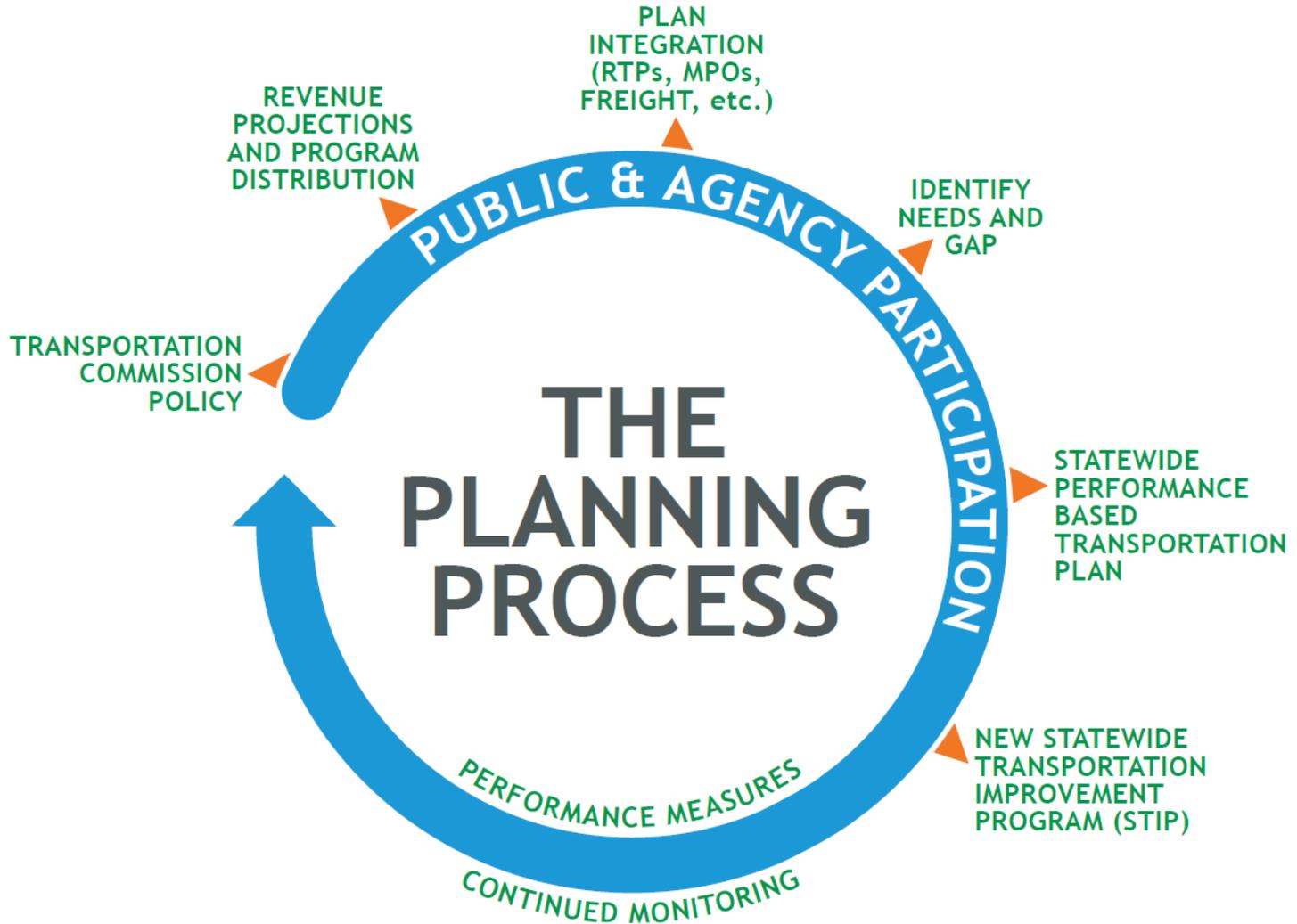


STIP Development Process / 4P

- **The STIP is developed through the continuing, cooperative, and comprehensive statewide multimodal transportation planning process CDOT carries out with the 15 TPRs.**
- **The process includes:**
 - Identification of transportation conditions and needs, forecasted revenues, performance objectives, and policies;
 - The development of long-range multimodal Regional Transportation Plans (RTPs);
 - The development of the long-range multimodal Statewide Transportation Plan (SWP);
 - The Project Priority Programming Process (4P).
- **This process provides the foundation for the creation of the STIP.**



STIP Development Process / 4P





Overview of STIP

- **STIP evaluated as part of Cash and Program Management initiatives**
- **Changes and improvements were coordinated with CDOT Regions and with MPOs to ensure alignment with TIPs**
- **Changes from previous STIPs include:**
 - Rolling four year STIP to maintain a full four years of programmed projects (new rolling four year STIP will still be developed through 4P every four years along with long-range plans)
 - CDOT projects shifting from budget based approach in STIP to expenditure-based to align with cash management
 - Streamlined to better align with federal requirements, increase flexibility, and reduce need for frequent amendment
 - More public friendly document – future improvements planned



Overview of STIP

- **What's included:**
 - Regionally Significant projects
 - A project serving regional transportation needs and of sufficient scale to be typically included in transportation demand modeling for air quality emissions analysis and identified individually in the STIP.
 - Projects are determined to be regionally significant for STIP purposes on the basis of federal guidance.
 - Examples: New highway segment, new lanes, new grade separated interchanges, significant improvements to existing interchanges
 - Programs
 - Specific funding programs are identified individually in the STIP.
 - Examples: Surface Treatment, Transportation Alternatives, CMAQ
 - MPO TIPs
 - Regionally significant projects and programs from all 5 MPO TIPs are incorporated into the STIP.



STIP Funding Levels

- **STIP funding levels are based on 2040 Program Distribution.**
- **Funding allocations for Capital Maintenance (Asset Management) and Annual Maintenance in Program Distribution and in the STIP are based on PD 14 objectives.**

2040 Program Distribution (FY 16-FY 19)*



*Reflects updated SB 228 forecasts. Does not include Program Delivery/Administration or Debt Service.



STIP At a Glance

- **Approximately \$5.6 B in projects and programs for FY 16-19**
 - Programs totaling \$3.7 B plus \$1.3 B in RTD projects and programs
 - 16 regionally significant projects totaling \$617 M
- **Additional projects and programs will be programmed as they are ready and incorporated into the STIP through subsequent STIP amendments or administrative modifications.**



STIP At a Glance

- **Selected Mobility and Operations Projects**

- Region 1

- I-70 East Reconstruction
- US 36: Boulder to I-25 Managed Lanes/BRT
- C-470 Managed Toll Express Lanes

- Region 2

- I-25 and Cimarron Interchange
- SH 21 Intersection/Interchange Improvements
- I-25 through Pueblo

- Region 3

- I-70B Widening in Grand Junction
- SH 82 Grand Ave. Bridge
- SH 9 Breckenridge North

- Region 4

- I-25 North: SH 7 to SH 14 Design and ROW
- SH 86 Intersection Improvements in Elizabeth
- US 385 Improvements in Cheyenne Wells

- Region 5

- US 550/160 Interchange Connection
- SH 145 Shoulder Widening and/or Passing Lane
- US 50 Passing Lanes/Vehicle Turnouts east of Salida



STIP Performance

PD 14 Goal Area	Primary PD 14 Objective	Primary STIP Funding Programs	Projected Performance
Bridges	Maintain the % of state highway total bridge deck area that is not structurally deficient at or above 90%.	Bridge Enterprise Bridge On-System	Programs funded to meet objective.
Highways	Achieve 80% High/Moderate Drivability Life for the state highway system.	Surface Treatment	Program funded to meet objective.
Maintenance	Achieve an overall Maintenance LOS B grade for the state highway system.	Maintenance	Program funded to meet objective.
Safety	Reduce the fatality rate per 100 million VMT by 0.02 per year. Reduce the serious injury rate per 100 million VMT by 0.2 per year.	FASTER Safety HSIP Hot Spots	Performance to be monitored. FASTER Safety and HSIP projects identified with the Regions using data-driven processes to identify locations and projects with the most significant safety benefits.
System Performance	Prevent the spread of congestion by maintaining a PTI of 1.24 or less on 90% or greater of interstate centerline miles.	ITS Investments Congestion Relief Traffic Signals SB 228	Performance to be monitored. Includes operations and ITS projects and limited capacity improvements.



STIP Approval Timeline

- **Timeline**

- March 18: TC review of Draft STIP and approval to release for public comment period
- March 27: STAC review of Draft STIP
- March 28-April 26: 30 day public comment period
- April 16: STIP Public Hearing at TC meeting
- April 24: STAC review of Draft STIP and public comments
- May 21: TC approval of STIP
- June: FHWA / FTA Approval of STIP
- July 1: FY 16-FY 19 STIP effective



Stand Up 4 Transportation—have a voice in keeping our transportation moving

Dear elected officials,

Transportation infrastructure affects us all. We need roads, highways, bridges, buses and rail lines. It's how people get from one place to another. It's how goods and supplies are delivered to our community. It's how our cities and towns are connected. It's how our residents and visitors recreate. It's the economic lifeline to our state.

It's up to the U.S. Congress to pass a multi-year bill that provides dedicated funding for transportation to pay for current and future highway and transit improvements. It's up to you to make your voice heard about how important transportation and funding are. Join the Colorado Department of Transportation, your local transit agencies, the Regional Transportation District and other local officials in the national transportation movement.

Stand Up 4 Transportation on Wednesday, April 8 at 10 a.m.

Durango, Grand Junction, Fort Collins and Colorado Springs

We invite you to join CDOT and our local transit partners for media events (location to be finalized) in communities around the state to discuss the role of transportation in our communities, the economy and for our residents. We will also discuss how CDOT and our local transit partners have been working to address the transportation needs in our regions, upcoming signature projects and how important funding is to addressing those needs.

Sign the Banners on Monday and Tuesday, April 6 - 7

CDOT and our local transit partners will be at a key transit location with a street team to talk to residents and riders about the role of transportation in their communities.

Stand Up 4 Transportation on April 9 at 10 a.m.

Denver

Join CDOT, RTD and our regional partners for an advocacy parade and rally at Union Station. Visit rtd-denver.com for details.

Sign the Online Petition

Voice your support for sustainable transportation funding by signing the online petition at standup4transportation.org.

Let's stand up together and send a united message about our roads, bridges, highways and public transit.