


Board Officers


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Bob Roth, Vice Chair
Herb Atchison, Secretary
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AGENDA

DRCOG Board Work Session

Wednesday, November 2, 2016
4 p.m.
1290 Broadway
First Floor Boardroom



1. Call to Order
2. Roll Call
3. Summary of October 5, 2016 Board Work Session
(Attachment A)
4. Public Comment
The chair requests that there be no public comment on issues for which a prior public hearing has been held before the Board of Directors.
5. Review of Metro Vision Regional Transportation Plan
(Attachment B) Jacob Riger, Transportation Planning Manager, Transportation Planning & Operations
6. Review the role of annexation in urban growth boundary/area (UGB/A) policy
(Attachment C) Brad Calvert, Director, Regional Planning & Development
7. Adjourn

Persons in need of auxiliary aids or services, such as interpretation services or assisted listening devices, are asked to contact DRCOG at least 48 hours in advance of the meeting by calling (303) 480-6701



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BOARD WORK SESSION SUMMARY
October 5, 2016

Directors present:

Bob Roth, Vice Chair
Elise Jones
David Beacom
Anthony Graves (Alternate)
Robin Kniech
Roger Partridge
Bob Fifer
George Teal
Laura Christman
Rick Teter
Steve Conklin
Daniel Dick
Lynette Kelsey
Ron Rakowsky
Phil Cernanec
Jackie Millet
Ashley Stolzmann
John Diak
Rita Dozal
Adam Matkowsky
Herb Atchison

Aurora
Boulder County
City and County of Broomfield
City and County of Denver
City and County of Denver
Douglas County
Arvada
Castle Rock
Cherry Hills Village
Commerce City
Edgewater
Federal Heights
Georgetown
Greenwood Village
Littleton
Lone Tree
Louisville
Parker
Superior
Thornton
Westminster

Directors participating via WebEx

Laura Brown
Storm Gloor (Alternate)
Casey Brown (Alternate)
Dana Gutwein
Sally Daigle

Frederick
Glendale
Golden
Lakewood
Sheridan

Others present: Wynne Shaw, Lone Tree; Derek Stertz – Centennial; Jamie Hartig, Kati Rider – Douglas County; Kent Moorman, Glenda Lanis – Thornton; Danny Herrmann – CDOT; Doug Rex, Director, Transportation Planning & Operations, and DRCOG staff.

Board Vice Chair Bob Roth facilitated the work session. The session began at 4:00 p.m.

Summary of July 6, 2016 Board Work Session

The summary was accepted as presented.

Public Comment

No public comment was received.

Review of Metro Vision Regional Transportation Plan (MVRTP)

Jacob Riger, Transportation Planning Manager, provided an overview of the Metro Vision Regional Transportation Plan. This presentation is the first on the MVRTP, there will be

others in the coming months. It was noted the MVRTP is scheduled to be adopted shortly after the Metro Vision Plan, early next year. The MVRTP covers all transportation projects in the metro area, both those that can be funded and those that do not have funding sources identified. A separate fiscally-constrained plan must be prepared to show only what can be reasonably funded within the 25-year timeframe of the plan. Director Partridge asked why the Plan looks out to 2040. Mr. Riger noted the Federal Highway Administration (FHWA) requires MPOs have a long-range (20-year) plan. There are many federal requirements for the plan, including public involvement, conformity with air quality standards, environmental justice, and fiscal constraint. The focus of today's information is on transit. Directors were asked to send any comments or suggestions to staff.

Review of Urban Growth Boundary/Area

Brad Calvert, Director of Regional Planning and Development, provided an overview of the Urban Growth Boundary/Area. Mr. Calvert noted the material contains a little bit of what was covered at the Board workshop, and the rest of the material is new. Mr. Calvert's presentation outlined several technical issues that must be resolved before staff can provide the Directors with the current extent of urban development, as requested at the Board workshop. The Directors provided guidance that staff should work with local government staff members to determine potential solutions.

Director Roth asked members to encourage their colleagues to attend these next few sessions as this is important information. Mr. Calvert noted that staff are available to assist Directors or staff with understanding the UGB/A.

The work session ended at 5:37 p.m.

ATTACH B

To: Chair and Members of the Board Work Session

From: Douglas W. Rex, Director, Transportation Planning & Operations
303-480-6747 or drex@drcog.org.

Meeting Date	Agenda Category	Agenda Item #
November 2, 2016	Information	5

SUBJECT

This item continues the topic of developing the new *2040 Metro Vision Regional Transportation Plan* (2040 MVRTP) introduced at the October meeting.

PROPOSED ACTION/RECOMMENDATIONS

N/A

ACTION BY OTHERS

N/A

SUMMARY

As introduced at the October meeting, the 2040 MVRTP implements the transportation portion of *Metro Vision* and contains the federally-required fiscally constrained long range transportation plan for the Denver region. The 2040 MVRTP is anticipated to be adopted in early 2017.

At the November Board work session, staff will present on the 2040 MVRTP's draft Active Transportation component (Attachment 1) and Freight component (Attachment 2).

The concept of active transportation (walking and bicycling) is receiving greater emphasis at the federal, state, and local levels. This component provides more depth and breadth of content than the Bicycle and Pedestrian sections of the 2035 MVRTP. Additionally, this component sets the stage for undertaking the Active Transportation Plan, a task in DRCOG's *2016-2017 Unified Planning Work Program* (UPWP). The Active Transportation Plan will expand the breadth and depth of content addressing non-motorized transportation and, once completed, will become part of the 2040 MVRTP.

Similarly, freight and goods movement is also receiving greater emphasis at both the federal and state level. DRCOG's UPWP also has a task to conduct a Regional Freight Movement Study. DRCOG staff is working closely with TAC, CDOT, and the freight community to prepare the freight section of the 2040 MVRTP. Staff is also participating on the statewide Freight Advisory Council (FAC) convened by CDOT. The draft freight section covers many topics traditionally important to freight, as well as technology and other evolving topics being raised by the FAC and other stakeholders.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

N/A

ATTACHMENTS

1. 2040 MVRTP draft Active Transportation component
2. 2040 MVRTP draft Freight component
3. Presentation slides

ADDITIONAL INFORMATION

If you need additional information, please contact Doug Rex, Director, Transportation Planning & Operations, at 303-480-6747 or drex@drcog.org; or Jacob Riger, Transportation Planning Manager, at 303-480-6751 or jriger@drcog.org.

ATTACH 1

ACTIVE TRANSPORTATION SECTION

A. Introduction

The DRCOG region, known for its arid climate and abundance of sunshine, is an ideal place for walking and bicycling. Also referred to as active transportation, walking and bicycling are flexible, accessible, healthy, and clean modes of transportation and can be used exclusively or in conjunction with other modes. The cycling culture is especially strong not only in the DRCOG region, but statewide. The number of people who bike to work in the DRCOG region is more than twice the national average and is increasing at a greater rate than any other mode.

Presently, there are almost 900,000 trips made each day by walking or bicycling in the region. Trends point to a continued uptick in the number of people who get around by walking and bicycling. While the region has a robust sidewalk and bicycling network, there are gaps to be filled and needs to be addressed in order to meet the demands for walking and bicycling; provide safe and comfortable options for people of all ages and abilities; and to fulfill the performance measures and targets currently being established as part of Metro Vision 2040.



The Active Transportation section of the RTP addresses the following topics; existing conditions for walking and bicycling in the DRCOG region, future projections for these modes, regional goals for active transportation, and strategies for meeting the goals. There will be an opportunity to delve deeper into active transportation topics during the development of the Active Transportation Plan, scheduled to commence in late 2016. The Active Transportation Plan will eventually be adopted as part of the RTP.

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B. Defining Active Transportation

Active transportation¹ is defined as a way of getting around powered primarily by human energy, via pedestrian and bicycling modes of travel. Pedestrian travel includes people walking or using wheelchairs², longboards, segways, and other mobility devices, such as walkers or crutches. Bicycling includes any type of wheeled and pedaled cycle, with or without an attached motor. Such means of travel enables multimodal transportation solutions to connect people of all ages, incomes, and abilities to where they need to go.

C. Walking and Bicycling in the DRCOG Region – Existing Conditions

Every day, almost 900,000 trips are made by walking and bicycling in the DRCOG region (*Source: DRCOG Travel Mode, 2015*). The region has a strong walking and bicycling culture, as evidenced by the country's



second-largest annual Bike to Work Day. As the region's population continues to increase, so will the number of people who travel via active transportation modes. While pedestrians and bicyclists make up only seven percent (*Source: DRCOG Travel Model, 2015*) of all person trips, they account for about 25 percent (*Source: NTSA – FARS, 2014*) of traffic fatalities, a disproportionately high percentage considering the shorter distances and travel times by these modes.

1. Miles of Active Transportation Facilities

DRCOG collects and maintains Geographic Information Systems (GIS) data for the region including pedestrian and bicycle facilities. While there are limitations in determining the exact miles of active transportation facilities, especially sidewalks, the technology and method of data collection is rapidly evolving and improving. Through the *Denver Regional Aerial Photography Project (DRAPP)* endeavor,



Planimetrics and quantifying sidewalk miles

In 2015, DRCOG began working on a region-wide project to map infrastructure features and assets, including sidewalk centerlines.

1,308 square miles of the urban core in the DRCOG Region have been mapped. Within that area, there is approximately 17,700 miles of sidewalk. This project was completed summer 2016.



¹ "Active transportation" and "bicycling and walking" will be used interchangeably throughout this document.

² All reference to walking and pedestrian travel in this document includes people using wheelchairs.

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DRCOG is in the process of obtaining sidewalk data throughout the region.

The method, referred to as *planimetrics*, currently captures sidewalks that are five feet wide or more. In the future, it might be possible to capture the entire sidewalk system, including total mileage. Regional planimetrics data collected to date can be accessed [here](#).

Obtaining bicycle facilities data and determining the number of miles is attainable by means of GIS.

DRCOG collects GIS data from member governments annually, which includes bicycle facilities. Through this effort DRCOG is able to map and quantify the number of miles of bicycle facilities in the region. The DRCOG region has a robust bicycle network comprised of over 2,300 miles of bicycle facilities. Table 1 classifies the bicycle facilities and associated miles into four categories including: roadways with signed shared lanes; roadways with bicycle lanes, roadways with protected bicycle lanes, and multi-use trails.

Table 1
Miles of Bicycle Facilities in the DRCOG Region

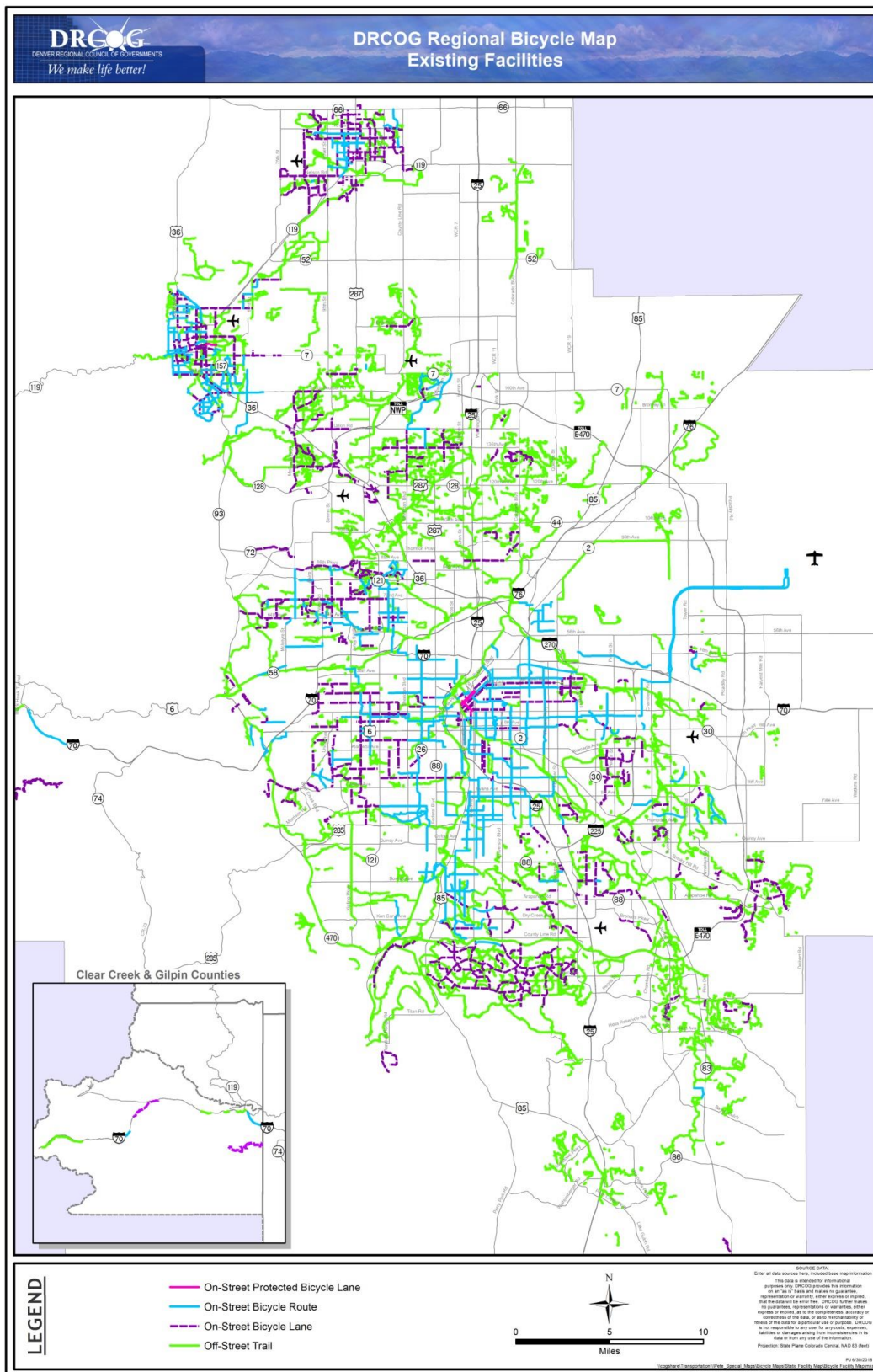
Bicycle Facility Type	Miles
Roadways with Signed Shared Lanes:	
Bicycle Route	325
Marked Shoulder Lanes	28
Roadways with Bicycle Lanes	430
Roadways with Protected Bicycle Lanes	3
Multi-use Trail:	
Wide Sidewalk*	35
Off-street Trail	1523
Regional Total	2344

* The multi-use trail category includes selected sidewalks (some communities permit bicycling on wide sidewalks, particularly as connections between other bicycle facilities and along busy major arterials).

2. Maps

DRCOG uses the GIS bicycle facilities data collected to maintain the [Denver Regional Bicycle Map](#), an interactive map of the existing bicycle inventory throughout the region. The method for mapping and classifying bicycle facilities varies among jurisdictions. DRCOG classifies bicycle facilities for mapping purposes into four categories: on-street bicycle route; on-street bicycle lane; on-street protected bicycle lane; and off-street trails. The map also includes bicycle share station locations. Figure 1 is an image of the *Denver Regional Bicycle Map*.

Figure 1



3. Active Transportation Facility Types in the DRCOG Region

There is a wide cross-section of pedestrian and bicycle facility types throughout the region which can be classified into two main categories. First, there are travelways, which is the infrastructure people walk and bicycle on. Then there is the infrastructure which supports walking and bicycling such as trees and other landscaping along sidewalks, wayfinding, and bicycle parking. Both travelways and the supporting infrastructure are important components in enabling active transportation by making these modes more convenient, accessible, and comfortable.

- **Pedestrian facilities.** The characteristics and quality of pedestrian facilities vary throughout the region. Many new residential and commercial developments incorporate wide sidewalks or buffered multiuse facilities. Conversely, many older neighborhoods have narrow and/or crumbling sidewalks, making it difficult to accommodate large numbers of people using wheelchairs or other mobility devices. In many places, facilities are non-existent and pedestrians are forced to travel along the road or on an unpaved social path.

Conduits for walking

As conduits for pedestrian movement and access, (sidewalks) enhance connectivity and promote walking.

— NACTO Urban Street Design Guide

Pedestrian facilities go beyond the sidewalk. On-street facilities refer to pedestrian treatments and travelways within the street used to improve and enhance pedestrian safety. Table 2 and the corresponding photo gallery include a cross-section of pedestrian facility categories and types found throughout the region.

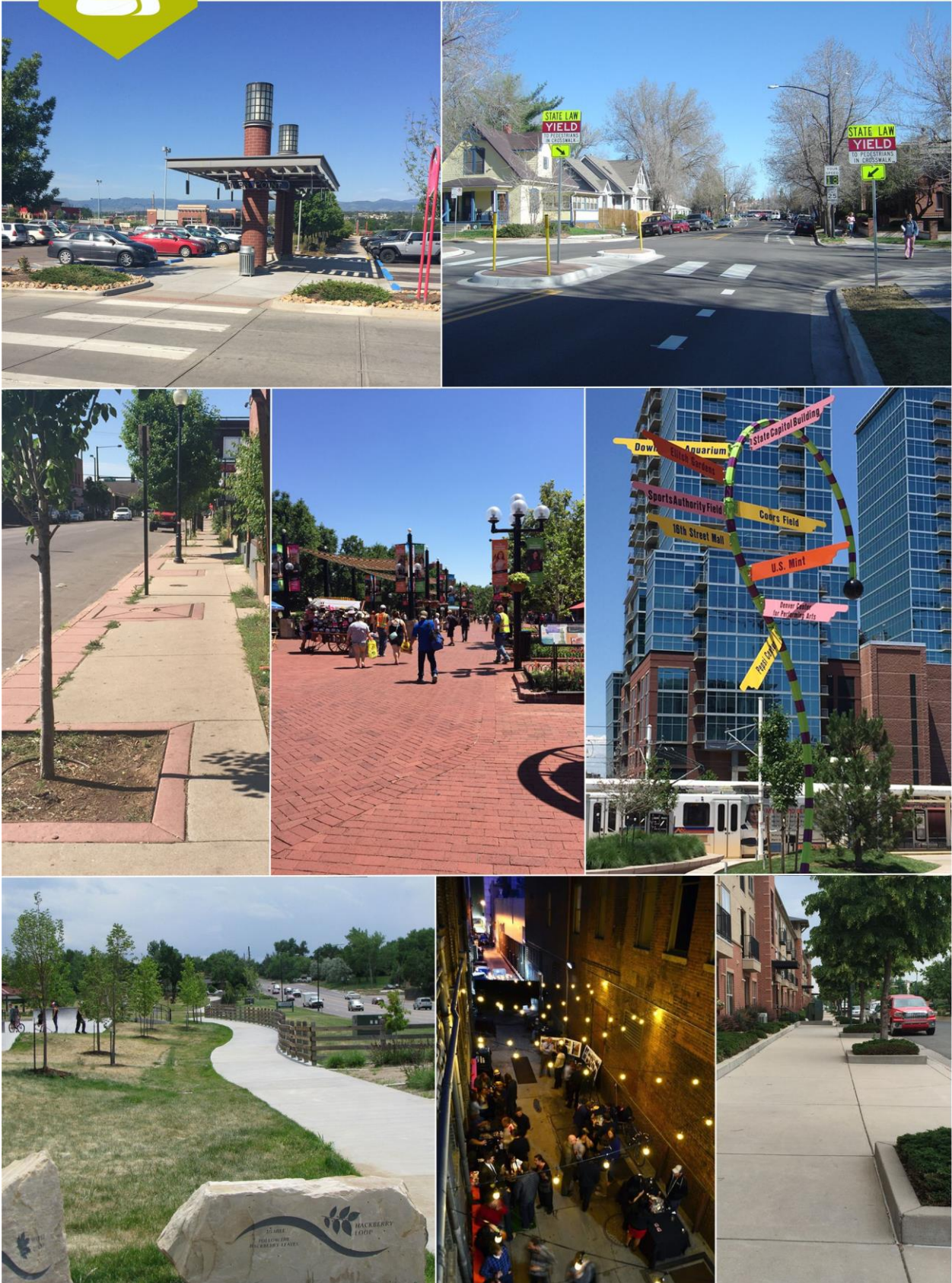
ATTACHMENT 1

Table 2
Pedestrian Facility Types in the DRCOG Region

Pedestrian Facility Category	Facility Type	Description	Photo #
Sidewalks	<i>Attached Sidewalks</i>	Pedestrian travelways connected to the curb or motor vehicle travel lane edge.	Attached sidewalk #1 Attached sidewalk #2 Attached sidewalk #3
	<i>Detached Sidewalks</i>	Pedestrian travelways separated from vehicle travel lanes using a planting strip or other appropriate buffer treatment.	Detached sidewalk
	<i>Shared-Use Paths</i>	Accommodating both pedestrians and bicyclists, these travelways are physically separated from motorized vehicular traffic by an open space or buffer and are either within the roadway right-of-way or within an independent right-of-way. Shared-use paths can be located (but not limited to) in a park, greenway; along rivers, railroads, utility rights of way; and along roadways.	Shared-use path
On-Street	<i>Crosswalks</i>	Typically defined as the portion of a roadway designated for pedestrians to use in crossing the street at an intersection (conventional), or between intersections (mid-block). Mid-block crosswalks are used to facilitate pedestrian crossings when there is significant distance between designated crossings and/or where there are destinations/places people want to go (pedestrian desire lines) but are not well served by existing traffic signals.	Crosswalk and pedestrian island
	<i>Pedestrian Islands</i>	Pedestrian islands can be located in the middle of a street at an intersection or at mid-block crossings. These islands provide a refuge for individuals moving at a slower speed when crossing a roadway. They are generally applied where there are higher speeds and volumes, but may be used on both wide and narrow streets.	
	<i>Shoulders (rural)</i>	Roadway shoulders provide a gravel or paved area for pedestrians to walk next to the roadway, particularly in rural area where sidewalks and pathways are not feasible (FHWA Safety Program).	N/A
Other	<i>Alleys</i>	Sometimes used by pedestrians (except where prohibited), function primarily as a place for trash collection, service vehicle access, and parking access. In some places such as downtowns and urban areas, alleys have been converted to public spaces for people to walk, play and interact.	Alley transformed to a public space (Source: Downtown Denver Partnership)
	<i>Intersections at Alleys</i>	When an alley crosses a sidewalk, potential conflicts can occur between pedestrians and vehicles. Rumble strips, warning signs, and raising the intersections to the sidewalk grade could mitigate conflict.	N/A
	<i>Pedestrian walkways in parking lots and structures</i>	Sidewalks provided through parking lots to the destination they are serving and to nearby pedestrian facilities, provides a safe place for pedestrians to travel.	Pedestrian walkways in parking lot
	<i>Pedestrian Zones and Plazas</i>	Also known as auto-free zones and car-free zones, are areas of a city or town reserved for pedestrian-only use and limits/prohibits vehicular traffic.	Pedestrian zones and plazas
Pedestrian Support Infrastructure	<i>Wayfinding</i>	Signage and/or pavement markings to guide both pedestrians and bicyclists to their destinations. Many jurisdictions have implemented or are implementing a destination-direction-distance based wayfinding system.	Wayfinding - whimsical



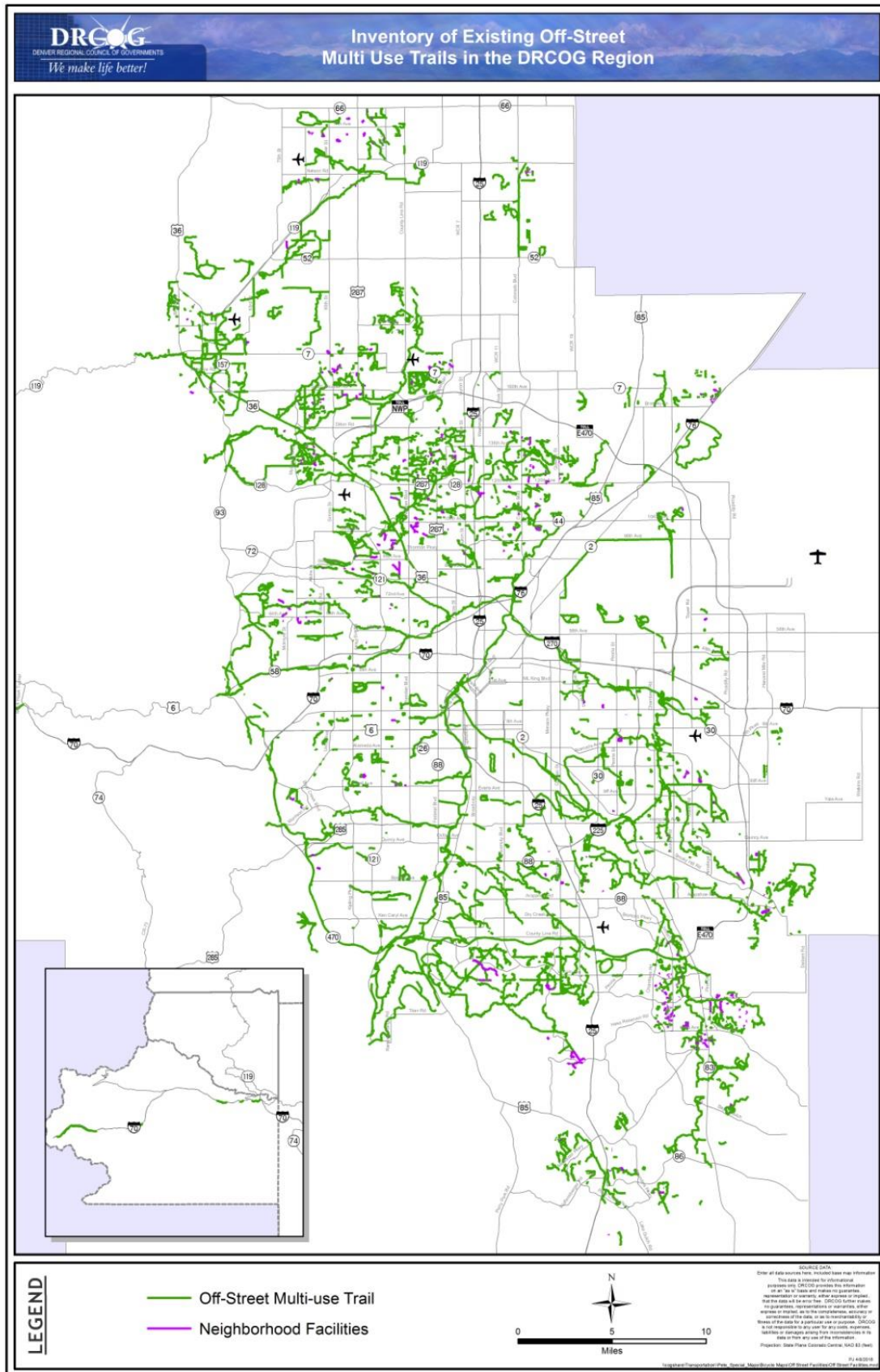
Pedestrian Infrastructure in the DRCOG Region



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- ***Bicycle Facilities.*** The DRCOG region has a robust bicycle system comprised of off-street trails, roadways with bicycle lanes, protected bicycle lanes, signed shared lanes, shoulders, and shared-use sidewalks. As illustrated in Table 1 and Figure 1, the majority of the existing bicycle network is comprised of multi-use trails accommodating both pedestrians and bicyclists, either in the form of off-street trails or wide sidewalks. [Figure 2](#) depicts the over 1,500 miles of multi-use trails in the region. [Table 3](#) and the corresponding photo gallery include a cross-section of bicycle facility categories and types within the region.

Figure 2



ATTACHMENT 1

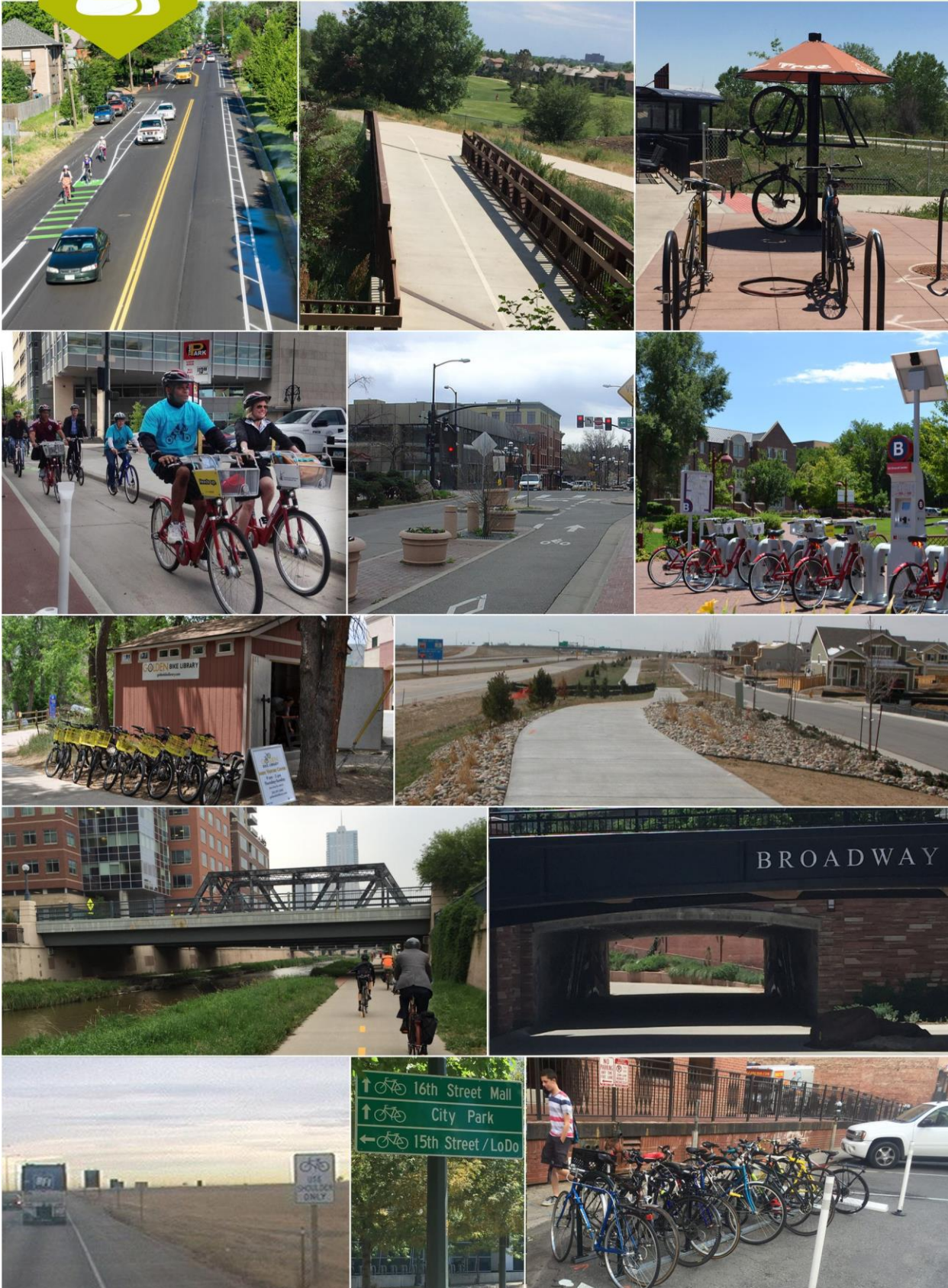
Table 3
Bicycle Facility Types in the DRCOG Region

Bicycle Facility Category	Facility Type	Description	Photo Links
On-Street Bicycle Facilities	<i>Conventional Bicycle Lanes</i>	On-street bike lanes for exclusive use by bicyclists through the use of pavement markings and signage. They are <i>typically</i> on the right side of the roadway, located adjacent to and flow in the same direction as motor vehicle traffic. While less common, bike lanes are sometimes placed on the left side of one-way streets or two-way median divided streets.	Conventional bike lane #1 (Source: City & County of Denver) Conventional bike lane #2
	<i>Buffered Bike Lanes</i>	On-street conventional bike lanes paired with an additional buffer from motor vehicle traffic by means of pavement markings and/or a parking lane. Parking Protected Bike Lanes refer to bike lanes buffered (or protected) from motor vehicle traffic by parked cars. Parking Protected Bike Lanes sometimes fall under the Protected Bike Lane category.	Buffered bike lane
	<i>Protected Bike Lanes (PBL)</i>	These bicycle facilities have three key characteristics: 1.) There is physical, stationary, vertical separation between the bike lane and motor vehicle traffic. Examples of vertical separation may include bollards, curbs, plastic posts, planters, raised bumps or parked cars; 2.) They are exclusively for bicycles; 3.) They are on or immediately adjacent to the roadway. PBL's are part of the street grid and can be at street level, raised to the sidewalk level, or somewhere in between. The three types of protected bike lanes include one-way, two-way and raised.	Protected bike lane with flex tubular markers (Source: City & County of Denver) Protected bike lane w/planters
	<i>Bicycle Boulevards</i>	Also referred to as Neighborhood Bikeways, Neighborhood Greenways, etc., these are streets with low traffic speeds and volumes that are designated and designed to give priority to bicycle travel through a range of design treatments. Typically, there is not a dedicated bike lane, but rather the street is shared by motor vehicles and bikes.	N/A
	<i>Paved Shoulder Bicycle Routes</i>	Paved shoulders are typically applied along roadways in rural communities or less developed areas. They should be striped and signed as a bicycle route and provide adequate space for bicyclists.	Paved shoulder with bike lane
Off-Street Bicycle Facilities	<i>Shared-use Paths</i>	Description provided in Pedestrian Section. There are three categories of shared-use paths: along roadway with buffer; along roadway with no buffer (sidepath); along waterway, railroad, through open space, etc.	Shared-use path along roadway Shared use path-waterway (Source: City & County of Denver)
	<i>Bridges/Overpasses and Underpasses</i>	Provide crossings for bicyclists and pedestrians where barriers exist, both real and perceived, such as: interstates, freeways, arterials with high speeds and volumes, railroads, rivers, and other obstacles.	Underpass - multiuse
Other Bicycling Support Infrastructure	<i>Bike Share</i>	Bicycles available for short-term use from a network of stations within a given geographic area.	Bike share
	<i>Bicycle Libraries</i>	Similar to bike share, but differ in that the bikes are typically checked out at a central location and are intended for longer-term use.	Bicycle library (Source: City of Golden)
	<i>Bicycle Parking</i>	There are many forms of short-term bicycle parking options such as U-racks, bike trees and bike corrals located on sidewalks and streets. These should be both visible and convenient to the businesses and locations they support.	Bicycle parking at transit Bicycle parking corral (Source: City & County of Denver)
	<i>Secure Bicycling Parking</i>	Intended for longer-term bicycle parking offering secure, weather-protected places to park bicycles at locations such as residential buildings, office buildings and at transit stations.	Secure bicycle parking (Source: Boulder County)
	<i>Wayfinding</i>	Signage and/or pavement markings to guide both bicyclists and pedestrians to their destinations. Many jurisdictions have implemented or are implementing a destination- direction-distance based wayfinding system.	Wayfinding

ATTACHMENT 1



Bicycle Infrastructure in the DRCOG Region



ATTACHMENT 1

4. Mode Share and Trip Statistics

On a typical day in the Denver region over 737,000 pedestrian trips and over 123,000 bicycle trips are made (*DRCOG Travel Model, 2015*). As of 2014, the combined percentage of people in the DRCOG region who commute to work by bicycle or walking throughout the year was 3.7 percent (*US Census, 5 year ACS 2010-2014*). This percentage is higher in summer months and also in downtowns like Boulder and Denver. While the percentage is small, the number of people who bicycle or walk to work has increased significantly over the past decade. For example, between 2005 and 2014, there was a 32 percent increase in the number of people who walk and bicycle to work (*Source*).

Pedestrian Travel

Everyone is a pedestrian at some point. Walking is the most flexible mode of travel and part of nearly all trips, even those taken primarily by another mode. Therefore, it is important that people have access to inviting and safe facilities to walk or travel by wheelchair. For some people, pedestrian travel may be the exclusive mode to get from one place to another. For others, pedestrian travel may be used in combination with other travel modes, such as transit, bicycling or driving. Walking is often the first and/or final mode of travel when combined with other modes.



- **All Trips.** Of the more than 12 million total person trips (all modes) made in the region per day, six percent of these trips are made by walking. Countless more short walking “trips” are made at the start or finish of trips by other modes. As expected, most walk trips are short, with an average distance of about 0.4 miles (*Source: DRCOG 2010 FRTC*). Of all the daily trips in the region that are 0.4 miles or less, around 100,000 are made by driving alone (*Source: DRCOG model 2015*).
- **Work Trips.** On a typical day in the region about 37,000 people, or 2.4 percent, of the working population walk to work (*US Census, 5 year 2010-2014*). This percentage is much higher when weather is nicer and in more dense locations with a mix of land uses. While the percentage of people walking to work has declined since 1980, trends have remained relatively steady since 2000 with slight fluctuations.

Walk to Work (35-year trend – DRCOG Region)

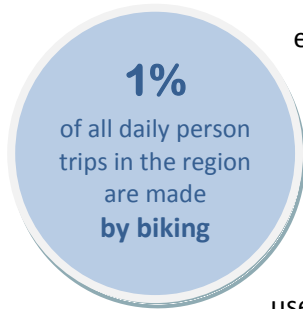
	1980	1990	2000	2010	2014
Mode Share	4.7 %	3.4 %	2.4 %	2.2 %	2.4 %

Source: US Census (1980-2010); 5-Year ACS (2010-2014)

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Bicycle Travel

The DRCOG region has one of the highest rates of bicycle use in the nation and a strong bicycling culture. The climate, relatively concentrated urban development, extensive off-street trail system,



expanding bike share systems, and health-oriented population contribute to the popularity of bicycling. Bicycles provide an efficient means of transportation for short- to medium-length trips. The number of people who bike to work has doubled in the DRCOG region between 2000 and 2014; the greatest percentage increase of all modes. Like pedestrian travel, bicycling may also be used in combination with other modes of transportation, especially transit.

- **All Trips.** Of the more than 12 million total person trips (all modes) made in the region per day, about 123,000 or one percent of these trips, are made by bicycling. The average bike trip distance in the DRCOG region is about two miles (*Source: DRCOG 2010 FRTC*). There are more than one million or 17 percent of drive-alone trips made each day that are two miles or less (*Source: DRCOG model 2015*). There is potential for some of these short drive-alone trips to be bicycle trips.
- **Work Trips.** The number of people who bike to work is increasing at a greater rate than any other mode. On a typical day in the region about 20,000 people or 1.3 percent of the working population bike to work (*US Census, 2014*) which is more than double the national average of 0.6 percent (*US Census ACS – Five Year 2010-2014*). This percentage is much higher in warm weather months and in more dense locations where there is a mix of land uses, mobility options such as bikeshare, and bicycle infrastructure. There is a clear gender gap in bicycle commuters. In the DRCOG region, 71 percent of bicycle commuters are male, whereas 29 percent are female (*ACS, 5 year, 2010-2014*). This trend is typical nationwide.

Bike to Work (35-year trend – DRCOG Region)

	1980	1990	2000	2010	2014
Mode Share	.7 %	.7%	.7 %	1.1%	1.2%

US Census, 1980 – 2000; ACS Data 2010 – 2014

ATTACHMENT 1

5. Safety

SUMMARY Pedestrian Crash Characteristics in the DRCOG Region

20% of traffic fatalities were pedestrians

61% of pedestrian crashes occur mostly on arterial streets

63% of pedestrian crashes occur at an intersection

77% of **fatal** pedestrian crashes involved a vehicle going straight

60% of **fatal** pedestrian crashes occur mid-block

17% of all traffic fatalities are those 65 and older, who currently make up 10% of the regional population



Pedestrians and bicyclists are particularly vulnerable transportation system users due to the high level of injury severity in the event of a crash. Active transportation users account for a disproportionately high percentage of traffic fatalities, considering the distance and time of travel by these modes. Lack of adequate sidewalks and crosswalks could lead pedestrians to compromise their safety by walking in the street or crossing mid-block. Lack of adequate bicycling infrastructure can result in bicyclists taking to the sidewalks due to safety concerns, creating unintended conflict with pedestrians. Also, bicycling on sidewalks could potentially lead to conflicts with turning vehicles at intersections if the bicyclist rides through the crosswalk.

Pedestrian Crash Statistics in the DRCOG Region

From 2010-2014, there were 868 traffic fatalities in the DRCOG region. Pedestrians made up 175, or 20 percent, of the fatalities (*NHTSA - FARS data*), yet only six percent of all trips were made by walking (*Source: DRCOG Travel Model, 2015*). The majority of pedestrian crashes occur on arterial streets (61%) and at intersections (63%). The vast majority of fatal pedestrian crashes occurred with a vehicle travelling straight (77%), with many occurring at mid-block (60%). While those 65 or older make up only ten percent of the regional population, they comprise 17 percent of pedestrian fatalities (*CDOT 2010-2012, NHTSA, 2014*).

Many factors contribute to collisions involving pedestrians. Some examples include:

- high-volume and high-speed roadways;
- turning vehicles at intersections;
- driver distractions – texting, talking, using the phone; and
- lack of dedicated crossing areas – e.g., significant gaps between crossing locations; and streets designed primarily for motor vehicles.

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Bicycle Crash Statistics in the DRCOG Region

During the period from 1991 to 2014, about 80 percent of bicycle crashes resulted in injury. Like pedestrians, bicyclists are considered vulnerable transportation system users, due to the high level of injury severity in the event of a crash. There are approximately 100 bicyclists seriously injured in reported traffic crashes each year in the DRCOG region.

Of the 868 total traffic fatalities in the DRCOG region from 2010-2014, thirty, or 3.5 percent of the fatalities, were bicyclists (*FARS data*). Around 12 percent of bicycle crashes results in a fatality or serious injury. (*CDOT 2010-2012*). The majority of bicycle crashes occur on arterial streets (53%) and at intersections (74%). Fatal bicycle crashes usually involved a vehicle going straight (71%). Bicyclists age 15 to 24 had the highest crash involvement. (*CDOT 2010-2012, FARS through 2014*).

Many factors contribute to collisions involving bicyclists. Some examples include:

- high-volume and high-speed roadways;
- turning vehicles at intersections;
- driver distractions – texting, talking, using the phone; and
- driver or bicyclist failure to signal or stop.

Understanding crash characteristics (how, why, where, and who) and trends is important in understanding how to apply appropriate mitigation strategies and countermeasures. Roadway types, existing infrastructure, crash history, pedestrian activity, and bicyclist usage (existing and anticipated) should also be considered when determining mitigation strategies.

More details on pedestrian and bicycle safety, including statistics and mitigation strategies, are available in the [Pedestrian and Bicycle Safety in the Denver Region Report](#) (2012 currently available, to be updated in 2016).

SUMMARY

Bicycle Crash Characteristics in the DRCOG Region

80% of bicycle crashes resulted in injury from 1991-2014

100 bicyclists **seriously injured** in reported traffic crashes each year

12% of bicycle crashes results in a fatality or serious injury

53% of bicycle crashes occur mostly on arterial streets

74% of bicycle crashes occur at an intersection

71% of **fatal** bicycle crashes involved a vehicle going straight

Those ages **15 to 24** had the highest crash involvement



ATTACHMENT 1

Safety Initiatives

Safety concerns are a leading barrier to more people walking and bicycling as a mode of travel. Many people are discouraged from walking and bicycling because of the real or perceived danger of vehicle traffic. This concern is most prevalent for bicycling. Many local and national organizations are striving to improve safety for all transportation users, with bicyclists and pedestrians being no exception. Two leading national efforts are Towards Zero Deaths and Vision Zero Initiatives. These efforts, aiming to reduce and eliminate traffic deaths and severe injuries, have been gaining traction throughout the United States.

- [**Toward Zero Deaths.**](#) Toward Zero Deaths (TZD), supported by FHWA, is a highway safety vision in the U.S. that includes numerous organizations committed to reducing annual U.S. traffic fatalities to zero. The TZD Plan provides organizations in the fields of engineering, law enforcement, education and emergency medical services (EMS) with initiatives and safety countermeasures designed to eliminate traffic fatalities. The State of Colorado joined this national effort in March 2015. CDOT's *Strategic Highway Safety Plan* incorporates Moving Towards Zero Deaths as a core value within the plan. CDOT's plan establishes a 2.9 percent annual reduction rate of all traffic fatalities starting in 2014 through 2019.
- [**Vision Zero.**](#) Vision Zero is an initiative which aims to eliminate traffic-related fatalities and serious injuries on the roadways while increasing safe, healthy, equitable mobility for all. Vision Zero, started in Sweden and implemented throughout Europe, is now gaining momentum in major U.S. cities. In early 2016, Denver joined other major U.S. cities that have adopted a Vision Zero policy.

A safe active transportation system is paramount in reducing and eliminating pedestrians and bicyclists from being seriously injured or killed, and in instilling confidence in more people to get around by walking and bicycling.

D. Benefits of Active Transportation

Active transportation is a key component in a robust transportation system providing mobility options for all people. There are many quality of life benefits associated with active transportation including: personal mobility, environmental quality, public health, and economic benefits.

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Personal Mobility

Some people choose not to drive, while others cannot drive. According to the 2010 Census, about 70,000 households in the region did not have an automobile available. A robust and safe pedestrian and bicycle infrastructure network can provide cost-effective mobility options for people of all ages, abilities, and incomes, especially when combined with the region's transit network. Walking and bicycling are essential modes of travel for many people to access jobs, school, groceries, health care, and other activities of daily living.

Environmental Benefits

Active transportation is an important tool to help the region address environmental challenges related to transportation, such as reducing air pollution, greenhouse gas emissions, and vehicle miles of travel. About one million drive-alone trips are made each day that are equal to or less than the average bicycle trip distance (1.8 miles) and over 100,000 drive-alone trips that are equal to or less than the average walk trip distance (0.4 miles). There are a number of factors as to why these trips are made by driving alone; however, there is potential to shift some of these trips to walking and bicycling.

Health Benefits

One out of every two U.S adults is living with a chronic disease such as heart disease, cancer or diabetes and more than two-thirds of American adults are either overweight or obese. While Colorado leads the nation in terms of healthy people, obesity rates in the state are projected to more than double by 2030 (Source: Surgeongeneral.gov, 2016). Additionally, the percentage of overweight children in the United States is growing at an alarming rate, with more than one-third of children and adolescents considered overweight or obese. In Colorado, 27% children ages 2 – 14 were considered overweight or obese in 2013 (Source: Colorado Department of health, March 2015). Walking and bicycling can be one factor in helping to reduce or mitigate stress, obesity, and chronic disease. Children who ride a bike two or more times a week are less likely to be overweight. Adolescents who bike are 48% less likely to be overweight as adults (Source: People for Bikes, Statistics Library). The

Comfort and Safety

The 8 to 80 rule is a litmus test that involves imagining a public space, especially a busy city street or intersection, and asking whether it is suitable for children, persons with disabilities, and older adults alike.

– Citylab, The 8 to 80 Problem: Designing Cities for Young and Old

Opportunity for Change

There are over 1 million trips made each day by driving alone that have the potential to shift to bicycling or walking.

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health benefits of active transportation are no longer isolated to the health care field and have become a central topic in planning and policy.

Economic Benefits

Walking and bicycling are cost effective options for getting around, can help people save money, and benefit local economies. Opting to bicycle or walk instead of driving can help reduce motor vehicle ownership costs, such as gasoline, maintenance and parking. These savings can equate to more money spent on local goods and services. Additionally, while the cost to construct these facilities greatly varies,

Economic Development

“The number one thing they want is bike lanes. Ten years ago we never would have thought that walkability or bike lanes would be economic development tools.”

— Tami Door, Downtown Denver Partnership,
on what tech companies say they want in order to
locate to or stay in Denver

Good Design

“Decisions and plans made by the transportation, land use, and community design sector can affect whether communities and streets are designed to support walking.

This sector can change the design of communities and streets through roadway design standards, zoning regulations, and building codes and improve the pedestrian experience through landscaping, street furniture, and building design.

This sector is also integral in the planning and implementation of public transit systems.”

— Surgeon General, 2015

many roadways can easily be retrofit to accommodate bicycles and pedestrians through the use of low-cost materials such as paint, planters and trees.

Demonstration, pilot and interim design projects are low-cost options to test out projects and applications where budgets are limited, and/or public education and buy-in is necessary.

Supporting the Framework of Metro Vision

In addition to the aforementioned benefits, a robust, safe and well-connected active transportation system supports the framework of DRCOG’s Metro Vision Plan. Active transportation is a key component in many of the Outcomes and Regional Objectives developed as part of the draft Metro Vision Plan. Additionally, an expanded active transportation system and increased use of these modes are essential elements in meeting the Performance Measures and Targets in the plan, such as increasing non-SOV mode share to work, and reducing greenhouse gas emissions, vehicle miles of travel, and number of traffic fatalities.

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E. Future Trends for Active Transportation – Projections for 2040

Looking forward to 2040, all total person trips are projected to increase by 35 percent, whereas walking and bicycling trips are projected to increase by 56 and 45 percent, respectively. Currently, about 737,000 or six percent of trips are made by walking. By 2040, over one million trips will be made by walking each day, accounting for almost seven percent of all weekday person trips. Bicycle trips are also projected to increase, from around 123,000 to 180,000 trips per day, but are forecast to still account for only one percent of all weekday person trips by 2040 (*Source: DRCOG travel model*).

Walking and Bicycling Trips: 2015 and 2040

Number of daily person trips	2015	2040
All Trips	12,977,100	17,475,878
By Walking	736,942	1,148,311
By Bicycling	122,759	178,501

F. Active Transportation Goals

To summarize active transportation in the DRCOG region:

- By 2040, the region's population is projected to increase by 37% and the number of active transportation trips is projected to increase by 54%.
- While the DRCOG region has a robust pedestrian and bicycle network, there are many gaps in the system and barriers to bicycling and walking.
- The quality of life benefits associated with walking and bicycling are numerous.
- A mode share increase in walking and bicycling is necessary in order to meet *Metro Vision* outcomes, objectives, and performance measures and targets.
- Pedestrians and bicyclists are vulnerable transportation system users and are more susceptible to being killed or seriously injured in the event of a crash.

In order to address the demands and challenges associated with regional growth, the demand for active transportation options, and support the framework of *Metro Vision*, the following goals pertaining to active transportation must be addressed:

1. Increase walking and bicycling mode share and trips beyond what is projected.
2. Provide a robust walking and bicycle network for people of all ages and abilities.

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3. Improve the safety of the pedestrian and bicycle network thereby reducing (and ultimately striving to eliminate) serious injuries and deaths as a result of crashes.

These three goals are synergistic; where, for example, a robust and safe active transportation network should result in a mode share increase for both bicycling and walking. How does the region:

- achieve these objectives?
- achieve and maximize the benefits of walking and bicycling?
- improve the safety of the network?
- create a network where people of most ages and abilities feel comfortable walking and bicycling?
- and ultimately, increase the active transportation mode share?

G. Elements to Fulfill Active Transportation Goals

This section identifies some of the elements that are necessary to fulfill the [three goals identified](#). While this is not an all-encompassing list, it does include the major pillars necessary in supporting the goals and vision for active transportation by 2040. These and additional elements will be further explored and expanded upon in the development of DRCOG's *Active Transportation Plan*, scheduled to commence in late 2016.

1. Low Stress (or High Comfort) Network

One of the most important elements in attracting more people to walking and bicycling is a low-stress network of active transportation facilities. Low-stress facilities, also referred to as high-comfort facilities, induce the least amount of stress on the users, and attract a wider segment of the population to walk and bicycle. Low-stress facilities are *typically* on or adjacent to roadways with lower traffic volumes and lower speeds (especially if the facility is on-street) and can include wide sidewalks buffered by landscaping, protected bike lanes, sidepaths, multiuse facilities, buffered bike lanes, bicycle boulevards, and neighborhood bikeways. Pedestrian and bicycle bridges and underpasses also provide a low-stress experience, allowing active transportation users to avoid busy intersections and roadways, and enabling mostly uninterrupted travel.

Low-stress Connectivity – *Attracts the Widest Possible Segment to Bicycling*

In a 2012 study from Northeastern University, *Low Stress Bicycle Bicycling and Network Connectivity*, researchers write: “For a bicycling network to attract the widest possible segment of the population, its most fundamental attribute should be low-stress connectivity. That is, providing routes between people’s origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress, and that do not involve an undue level of detour.”

—Furth et al., *Network Connectivity for Low-Stress Bicycling*, Submitted to TRB for the 2013 Annual meeting and publication in Transportation Research Board

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Over the past few years, there has been a regional focus on constructing, expanding and connecting a low-stress network of facilities to appeal to a wide audience of ages and abilities. Pedestrian and bicycle facilities alike should be planned and developed for the most vulnerable users (children, older adults, and people with disabilities).

2. Connecting the Active Transportation Network

Also essential to attracting a wider segment to walking and bicycling is continuity and consistency in the active transportation system achieved by **connecting the low-stress network**. In addition to filling in gaps and connecting facilities, it is important to identify and connect to desirable destinations and to other modes of transportation. A low-stress, well-connected network of active transportation facilities can be obtained through the following actions:

- Taking inventory of the existing bicycle and pedestrian network.
- Identifying missing segments and barriers in the existing network.
- Filling in gaps and removing barriers to the existing network.
- Identifying gaps and barriers to first and final mile connections.
- Filling in gaps and removing barriers to first and final mile connections.
- Create a consistency in the network.
- Expanding the active transportation network, ideally with low-stress facilities.

3. Multimodal Transportation Nodes

Having a mix of transportation options and amenities conveniently available and located at popular destinations, in urban and town centers, and at transit stations, can make walking and bicycling more feasible. People might be willing to get around more by walking or bicycling if modes were clustered together and easily accessible, such as carshare, transit, transportation network companies (Uber, Lyft) and taxis, bike share and secure bicycle parking. Denver Union Station is a premier example of a multimodal transportation node in the Denver region. However, multimodal transportation nodes are not reserved only for urban cores, and they have the potential to be successful in suburban town centers and suburban transit-oriented development.

4. Complete Streets

Complete streets are designed to safely accommodate both motorized and active modes of transportation. According to the National Complete Streets Coalition, complete streets are those designed and operated to enable safe access and travel for all users. Pedestrians, bicyclists, motorists,

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transit users, and travelers of all ages and abilities will be able to move along the street network safely. Although the FHWA does not have an official complete streets policy, the concept is closely associated with the principles promoted by the Interagency Partnership for Sustainable Communities, a joint endeavor involving the U.S. Department of Transportation (USDOT), U.S. Department of Housing and Urban Development (HUD), and U.S. Environmental Protection Agency (EPA). (Source: [FHWA, Public Roads, July/August 2010](#)). All modes, including walking and bicycling, should be considered in new roadway and reconstruction projects to enable safe travel for all transportation users. As of 2016, the only known jurisdictions in the DRCOG region to have adopted or incorporated complete streets in policies, resolutions, or plans include the City of Denver and City of Golden.

5. Supporting Infrastructure and Technology

Infrastructure and amenities supporting active transportation are influential to their usage. Examples of supporting infrastructure include: pedestrian shelters at transit stops; shade trees and landscaping along sidewalks; bicycle racks and secure bicycle parking; and wayfinding. Additionally, real-time multimodal transportation applications and routing capabilities further support and enable walking and bicycling as stand-alone modes or used in conjunction with another mode. For example, technology could easily enable people using transit to reserve a bicycle (bikeshare) or car (carshare) at the end of the trip to access their final destination. Supporting infrastructure, amenities, and technology should be convenient, easily accessible and intuitive.

H. Role of DRCOG in Implementing Active Transportation Projects

DRCOG plays an integral role in both supporting and funding active transportation in the DRCOG region. Projects categorized as pedestrian and bicycle infrastructures are funded directly through the TIP process. The percentage of funds allocated to pedestrian and bicycle projects has increased over the past three TIP cycles. In the current TIP (2016-2021), 22 percent of funds are allocated to projects classified as bicycle and/or pedestrian infrastructure and 100 percent of these projects selected were either protected or grade separated from the roadway. Pedestrian and bicycle projects are also funded indirectly as elements of larger TIP projects, such as roadway projects. Roadway projects have been incentivized in the TIP application process to include multimodal features like bicycle and pedestrian travelways and support facilities.

In 2016, DRCOG will undertake the development of an Active Transportation (AT) Plan. It is intended for the Active Transportation Plan to eventually become an element of, and adopted into the MVRTP. The Active Transportation Plan will expand upon the elements of this section of the MVRTP and incorporate

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additional components and products such as a Regional Bicycle Network Vision. DRCOG staff will work closely with member jurisdictions and other stakeholders in the development of this plan.

I. Design Guidelines and Resources

Pedestrian and bicycling facility typologies and design are not one size fits all and will vary depending on local community character factors such as existing/planned land uses, density, adjacent roadway types and widths, density, and usage. Recognizing the great diversity in the region, DRCOG does not prescribe blanket design guidelines and requirements that apply equally to all jurisdictions and projects. The TIP policy establishes certain requirements for the project selection process, such as minimum widths for multiuse facilities, and directs jurisdictions to follow ADA and AASHTO design standards. Additionally, there are a variety of design resources (Figures 4 and Figure 5) available which are continually evolving. In addition to local guidelines and requirements, jurisdictions should utilize these guides in the planning and design process of pedestrian and bicycle facilities. DRCOG encourages jurisdictions and counties to communicate and coordinate where possible on pedestrian and bicycle plans and projects with neighboring jurisdictions and other applicable stakeholders to achieve consistency and connectivity across boundaries.

Figure 4

DESIGN GUIDE RESOURCES FOR PEDESTRIAN FACILITIES

- [*Guide for the Planning, Design, and Operation of Pedestrian Facilities*](#), July 2004, (AASHTO Pedestrian Guide)
- [*Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*](#). (ITE Guide). This guide is useful in gaining an understanding of the flexibility that is inherent in the AASHTO "Green Book," [*A Policy on Geometric Design of Highways and Streets*](#).
- *Urban Street Design Guide*, 2013, (National Association of City Transportation Officials)
- *Guidance Memorandum on Promoting the Implementation of Proven Safety Countermeasures*, 2012, (FHWA)
- [*2010 ADA Standards for Accessible Design*](#), (Department of Justice)
- [*Proposed Guidelines for Pedestrian for Pedestrian Facilities in the Public Right-of-Way \(PROWAG\)*](#), (United States Access Board), 2011

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Figure 5

DESIGN GUIDE RESOURCES FOR BICYCLE FACILITIES

- *Guide for the Development of Bicycle Facilities*, 2012 – Fourth Edition, (American Association of State Highway and Transportation Officials)
- [*Urban Bikeway Design Guide*](#), 2014 – Second Edition, (National Association of City Transportation Officials)
- *CDOT Roadway Design Guide – Chapter 14 Bicycle and Pedestrian Facilities*, Jan 2013, Revision 1, (CDOT).

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DRCOG 2040 Metro Vision Regional Transportation Plan Freight Section

DRAFT for Board Work Session Review: October 2016

A. Introduction

The efficient movement of freight, goods, and packages is extremely important to Colorado and the Denver region's economy. Items are moved by railcars, trucks, vans, airplanes, and pipelines. They move to, from, and within points in the region or pass through without a delivery or pickup. Major multimodal terminals transfer large amounts of cargo between the various travel modes and trucks. Most freight facilities and terminals are concentrated near freeways and major regional arterials. Local deliveries and pickups to and from businesses in the area depend on the reliability of the regional and local roadway systems.

"Freight customers and economics drive the market and locations where freight moves."

- 2004 Freight Forum at DRCOG

B. Freight Background

Freight represents any physical goods, parcels, raw materials, or finished products that are transported from one place to another. For the MVRTP, the focus is on surface freight transportation modes and facilities – highways, streets, rail, and multimodal terminals. (The aviation section of the MVRTP addresses aviation-related freight issues.) Examples of freight movement types include:

- Coal shipped by rail from Wyoming **through** Denver to Texas;
- Goods transported by truck or rail **to** the Denver region for local or statewide distribution;
- Local products shipped **from** the metro area via truck or railcar to the Midwest;
- Perishable agricultural products shipped **within and beyond** the region ("farm to table/market");
- Packages delivered **within** the region from Longmont to Littleton;
- Automobiles arriving from manufacturers via railcar, then **transferred** to truck trailers;
- Letters and parcels arriving by air and then **distributed** by express delivery services; and
- Cross-country goods traveling westbound that arrive in "triple trailer" trucks and then are **converted** to "double trailer" and "single trailer" trucks to cross the mountains.

Freight transport has become more diverse in recent years. Examples include home grocery delivery, "app-based" on-demand delivery of goods and services, and food trucks, and other examples.

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Denver is the northern end of the Ports to Plains corridor connecting Colorado to Mexico via Laredo, Texas. This could lead to increasing the Denver region's role as a distribution center and freight consolidation point for goods shipped to and from Mexico via I-70, US-40, and US-287.

C. Federal Freight Requirements & Guidance

The Fixing America's Surface Transportation Act (FAST Act) contains several provisions addressing freight, including:

- Establishing a National Multimodal Freight Policy (NMFP) that includes national goals to guide decision-making, and creates the National Multimodal Freight Network (NMFN), with corridors eligible to receive \$4.5 billion over five years through a new discretionary freight-focused grant program.
- Establishing a National Highway Freight Network (NHFN) and a National Highway Freight Program (NHFP) and providing \$6.3 billion in formula funds over five years for states to invest in freight projects on the NHFN.
- Requiring states to develop freight plans to be eligible to receive funding under the NHFP.
- Requiring the development of a National Freight Strategic Plan (NFSP) to implement the goals of the new National Multimodal Freight Policy.
- Creating new authorities and requirements to improve project delivery and facilitate innovative finance.
- Encouraging the establishment of state-level Freight Advisory Committees.

The FAST Act establishes an NMFP of maintaining and improving the condition and performance of the National Multimodal Freight Network (NMFN). It specifies goals associated with this national policy related to the condition, safety, security, efficiency, productivity, resiliency, and reliability of the network, and also to reduce the adverse environmental impacts of freight movement on the network. These goals are to be pursued in a manner that is not burdensome to State and local governments. Specifically, the network is used for four key purposes:

- 1) Assist states in strategically directing resources toward improved system performance for the efficient movement of freight on the NMFN;
- 2) Inform freight transportation planning;
- 3) Assist in the prioritization of federal investment, and
- 4) Assess and support federal investments to achieve national multimodal freight policy goals, and national highway freight program goals.

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Projects on the NMFN are eligible to receive discretionary freight-focused grants in which states, MPOs, local governments, and other parties compete for funding (\$4.5 billion over five years) to complete projects that improve safety, eliminate freight bottlenecks, and improve critical freight movements.

The National Freight Strategic Plan (NFSP) will address the conditions and performance of the multimodal freight system, identify strategies and best practices to improve intermodal connectivity and performance of the national freight system, and mitigate the impacts of freight movement on communities.

The FAST Act also includes provisions intended to reduce the time it takes to break ground on new freight transportation projects, such as by promoting best contracting practices and innovative financing and funding opportunities, and by reducing uncertainty and delays with respect to environmental reviews and permitting.

To receive funding under the NHFP (\$6.3 billion over five years for projects on the NHFN), states must develop a state freight plan, which must comprehensively address the state's freight planning activities and investments (both immediate and long-range). A state may develop its freight plan either separately from, or incorporated within, its statewide federally required long-range transportation plan. Among other requirements, a state freight plan must:

- cover a five-year forecast period, and
- be fiscally constrained;
- include a "freight investment plan" with a list of priority projects, and
- describe how the State will invest and match its National Highway Freight Program funds.

Additionally, the FAST Act continues a MAP-21 requirement for DRCOG, in coordination with CDOT, to develop and report on freight-related performance-based planning targets and measures.

Finally, DRCOG's freight planning efforts (described in the next section) are also designed to address federal transportation planning factors, in particular:

- Planning Factor #1: Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.
- Planning Factor #4: Increase the accessibility and mobility options available to people and for freight.

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- Planning Factor #6: Enhance the integration and connectivity of the transportation system, across and between modes, and for people and freight.
- Planning Factor #7: Promote efficient system management and operation.

The FAST Act added two new factors that DRCOG's planning efforts will also address:

- 1) Improve resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of surface transportation, and
- 2) Enhance travel and tourism.

D. Current Freight Planning Efforts & Stakeholder Input

DRCOG, CDOT and others are currently involved in several freight-related planning efforts. For example, this document updates and significantly expands the content of the freight section of the 2035 MVRTP. It is the first step in conducting a regional freight movement study, a task in DRCOG's Unified Planning Work Program. This study will be prepared using data, information, and outcomes from CDOT's multimodal freight plan (discussed below) for future amendment into the MVRTP.

DRCOG also recently completed a commercial vehicle survey to provide data for its regional travel forecasting model, FOCUS. The survey was conducted in partnership with CDOT and other Front Range MPOs to increase understanding of how commercial vehicles of all types affect travel and traffic patterns in the Front Range.

CDOT convened a state Freight Advisory Council (FAC) in 2015, with DRCOG hosting the kickoff meeting and participating in the FAC. Among other responsibilities, this group advises CDOT on freight-related priorities, issues, projects, and funding needs.

CDOT completed the State Highway Freight Plan in 2014. It is the first phase of CDOT's overall multimodal freight planning efforts. CDOT is developing its state freight plan in two phases. The MAP-21-compliant State Highway Freight Plan completed in 2014 was the first phase. The second phase will develop an integrated freight plan that incorporates rail and aviation freight modes. As noted above, DRCOG is participating in this process to leverage data, information, outcomes, and recommendations for the DRCOG planning area.

CDOT also developed the State Freight and Passenger Rail Plan in 2012 to meet the requirements of the federal Passenger Rail Improvement and Investment Act of 2008. The plan's purpose is to "provide a framework for future freight and passenger rail planning in Colorado" and "to move freight rail

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transportation forward with a focus on economic development, as well as set the stage for the state to take advantage of the momentum around the country in regard to the interest in expanding passenger rail service.” The plan also created and adopted a vision and several goals addressing the state’s freight and passenger rail system. Finally, policy recommendations and short and long term illustrative rail system improvement needs were also identified in the plan.

1. Freight Stakeholder Input

DRCOG has conducted, hosted, and participated in numerous freight stakeholder activities, events, and organizations in recent years. Key examples include:

- Colorado Freight Summit (July 2009)
- Colorado Freight Summit Roadmap (December 2009)
- I-70 Mountain Corridor Coalition (ongoing)
- CDOT MPO Town Halls (May 2014)
- CDOT Statewide Freight Advisory Council (July, September, and November 2015)
- Focus group on freight and commercial vehicles within mixed-use communities (September 2015)
- DRCOG Commercial Vehicle Survey (2015/2016)

2. Key Concerns from Stakeholders

DRCOG has also received significant feedback from freight stakeholders over the years; this feedback has consistently emphasized the following concerns:

- Congestion on the road system. The levels of congestion slow truck operations and increase the cost of moving freight. Ultimately, the consumer pays higher prices for goods and services. (see Figure 1, pg. 6)
- One impact of increased roadway congestion may be more truck traffic on the roads during peak periods with smaller payloads. Most trucking companies must meet customer-required delivery and pickup times. As the speed of traffic slows, more trucks may be added to the traffic flow to meet the customer schedules. This is because an individual truck may not be able to make as many deliveries or travel as far during congested periods.



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- Rail freight traffic through the Front Range metropolitan areas is slow and has safety issues at rail-highway crossings.
- Many of the older roadways present problems in efficiently moving freight. Facilities built in the 1950s used design principles for shorter trucks and lower volumes. The design for shoulders were narrow and for lower volumes at interchanges. Turning radius on the surface streets were tighter for smaller trucks or reduced as lanes added within existing rights-of-way. Many long haul operations now use two (tandem) or even three (triple) trailer combinations. The turning movements, especially, take more space than was designed into many existing roads.
- Many of the bridges cannot handle the larger freight loads. Bridges with weight limits create out-of-direction travel, increasing miles traveled, time consumed and cost to move freight.
- With increases in overall freight movement and size of truck fleets, many existing connections to multimodal freight facilities need to be improved.
- The increase in truck traffic has overloaded the rest area spaces for parking trucks while in-route. Many truckers are stopping in undesignated places, including the side of the road.
- According to the Colorado Motor Carriers Association, various regulations affect the times deliveries and pickups can be made. This has an effect on freight operations by limiting the number of stops a truck can make. It also leads to more trucks operating during peak periods, increasing the time to complete trips. Both of these characteristics increase the cost to move freight. The second adds to congestion during the peak periods. Some of this can be seen as more trucks on the road with partial loads.
- Shortages of qualified commercial vehicle/truck drivers in the labor force.
- Poor roadway conditions, such as pavement, markings, crumbling pavement, generally aging infrastructure, and others.
- Another important freight issue is circulation and delivery within transit-oriented developments, traditional neighborhood developments, and other new urban neighborhoods with very narrow streets.

Consistent freight-related themes from the 2014 MPO and Transportation Planning Region (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

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- 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 multimodal 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 – noise mitigation and wear and tear on roadways are also issues

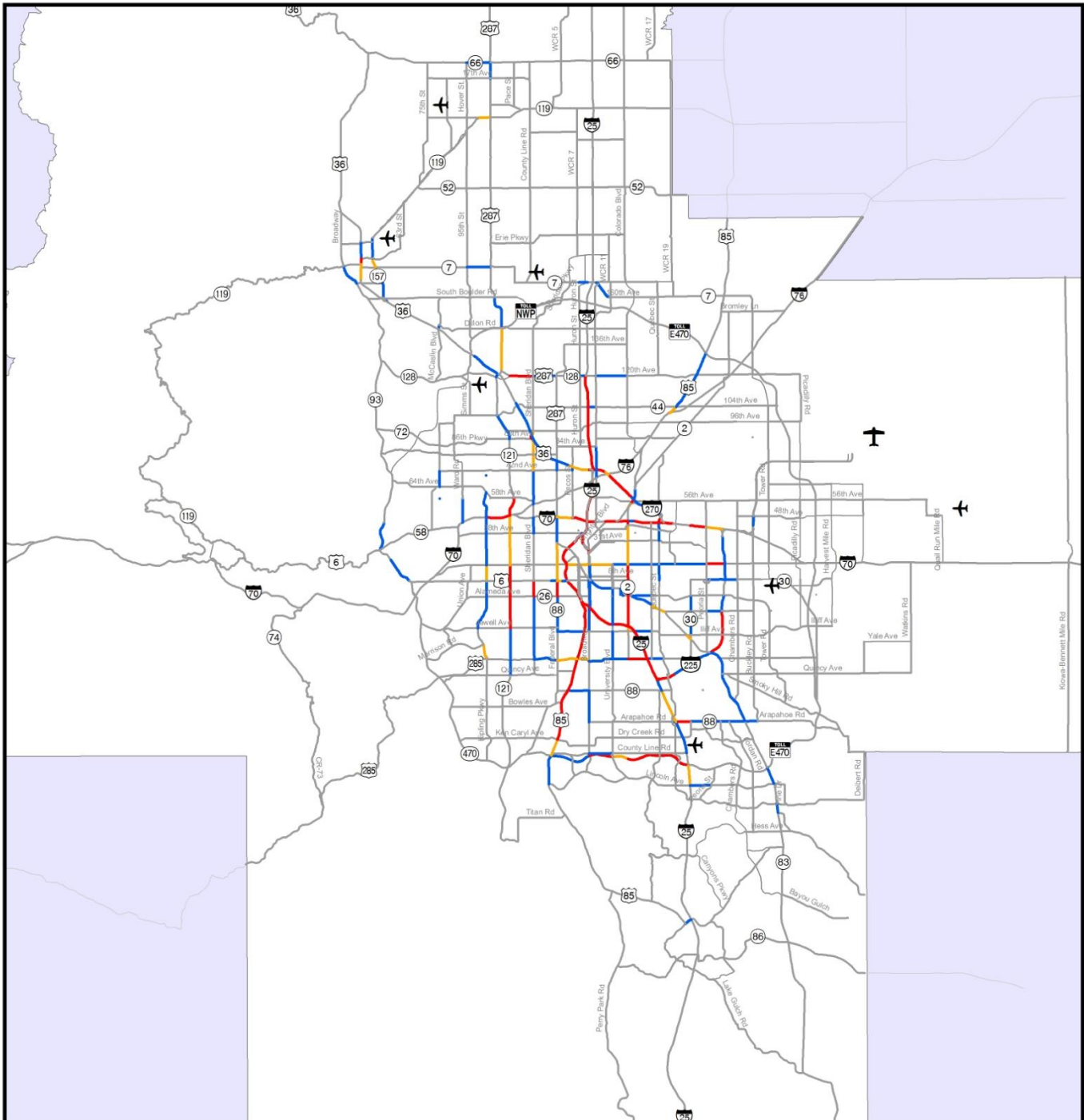
3. Other Activities

DRCOG also addresses freight in its Congestion Mitigation Program (CMP). For example, the *2012 Annual Report on Traffic Congestion in the Denver Region* contains a section analyzing the cost of congestion to commercial vehicles, mitigation strategies, and other data. Figure 1, updated with 2014 data, identifies the locations with the highest congestion costs to freight and businesses. In sum total, the cost of congestion delay is more than \$1 million a day to commercial vehicles and businesses in the DRCOG region.



Figure 1
2014 Locations with Highest Congestion Costs to Freight/Businesses

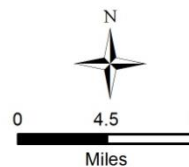
Metro Vision Regional Transportation Plan



LEGEND

Daily Cost / Mile

- < \$1,000
- \$1,000 - \$2,000
- \$2,000 - \$3,000
- > \$3,000



SOURCE DATA:
Enter all data sources here, including base map information.
This data is intended for informational purposes only. DRCOG provides this information on an "as is" basis and makes no guarantee, representation or warranty, either express or implied, that the data will be error free. DRCOG further makes no guarantees, representations or warranties, either express or implied, as to the completeness, accuracy or correctness of the data, or as to merchantability or fitness of the data for a particular use or purpose. DRCOG is not responsible to any user for any costs, expenses, liabilities or damages arising from inconsistencies in its data or from any use of the information.
Projection: State Plane Colorado Central, NAD 83 (feet)

PJ 11/11/2015

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E. Freight Network & Facilities

Freight is transported in the Denver region through an interconnected system served by several major travel modes, a roadway and railroad system on the ground, and several multimodal transfer facilities. Figure 2 shows the Denver region's rail, air, and multimodal freight network. The regional freight network includes both public (Figure 2) and private facilities; the latter include railroad tracks, loading docks, production warehouses, and other similar components. It is important to remember that every single street is part of the freight network, from long-haul trucking on interstate highways to residential deliveries on local streets.

The FAST Act establishes a [National Multimodal Freight Network](#) (NMFN) to help states and the federal government plan and strategically allocate funding to support efficient freight movement. An [interim network](#) was released in mid-2016 and serves as a draft for the final NMFN.

In Colorado, the interim NMFN includes the National Highway Freight Network (NHFN) in Colorado (the interstates, small segments of E-470, US 6, US 85, and SH 2 in the metro Denver area and eight intermodal connectors in the metro Denver area), as well as all Class I railroads, and Denver International Airport. The final NMFN will be designated by the end of 2016 and will further incorporate any Critical Rural and Urban Freight Corridors designated by that time.

The FAST Act continues a MAP-21 requirement that US DOT establish a national freight network consisting of the National Highway System, freight intermodal connectors, and aerotropolis (airport-related) facilities. The FAST Act repealed both the Primary Freight Network and National Freight Network from MAP-21, and established a NHFN to strategically direct Federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system.

The NHFN includes the following subsystems of roadways:

- **Primary Highway Freight System (PHFS):** This is a network of highways identified as the most critical highway portions of the U.S. freight transportation system determined by measurable and objective national data. The network consist of 41,518 centerlines miles, including 37,436 centerline miles of Interstate and 4,082 centerline miles of non-Interstate roads.
- **Other Interstate portions not on the PHFS:** These highways consist of the remaining portion of Interstate roads not included in the PHFS. These routes provide important continuity and access to freight transportation facilities. These portions amount to an estimated 9,511 centerline miles of Interstate,

Attachment 2

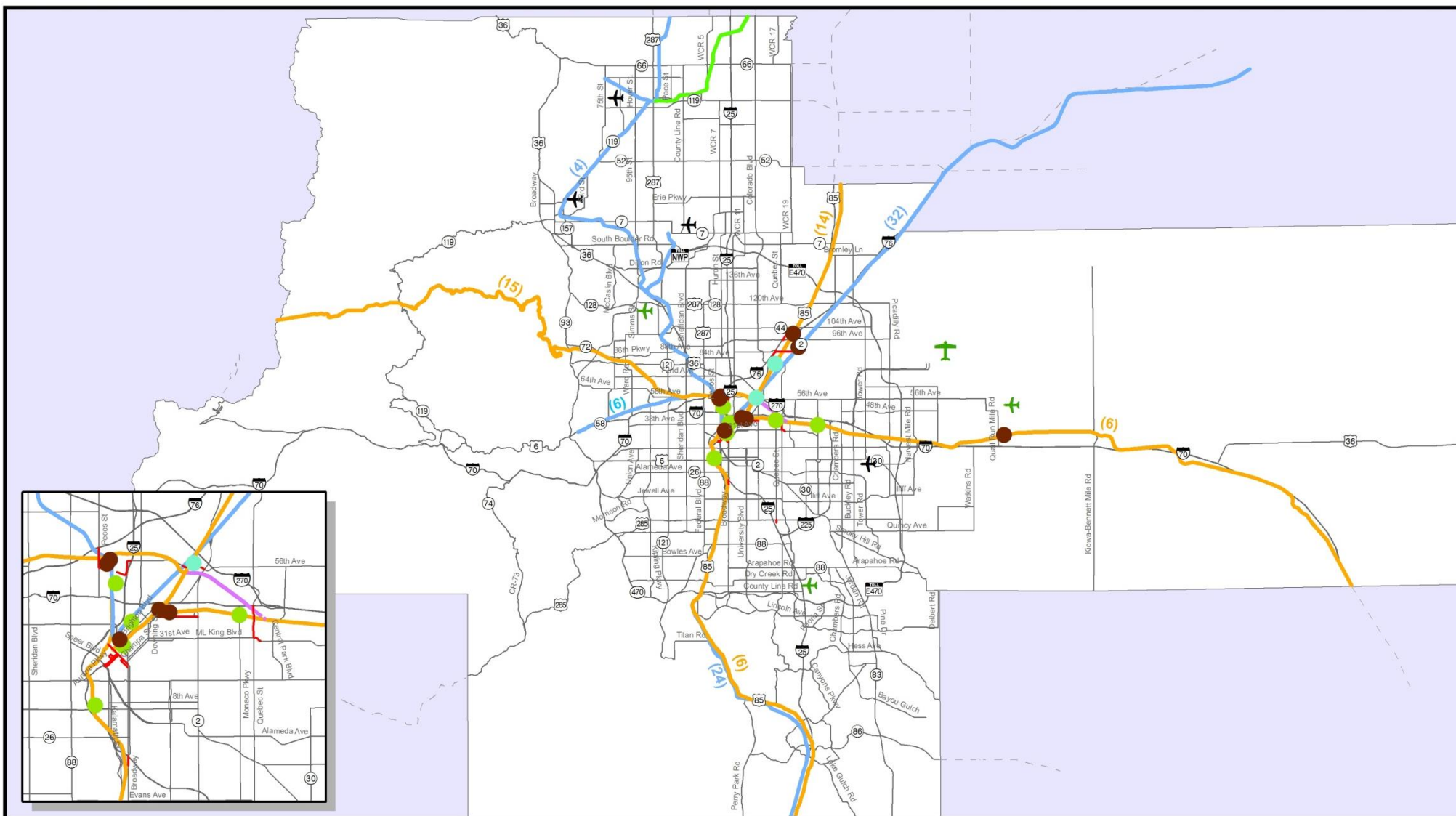
nationwide, and will fluctuate with additions and deletions to the Interstate Highway System.

- **Critical Rural Freight Corridors (CRFCs):** These are public roads not in an urbanized area which provide access and connection to the PHFS and the Interstate with other important ports, public transportation facilities, or other intermodal freight facilities.
- **Critical Urban Freight Corridors (CUFCs):** These are public roads in urbanized areas which provide access and connection to the PHFS and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

Prior to designation of CRFCs and CUFCs, the NHFN consists of the PHFS and other Interstate portions not on the PHFS, for an estimated total of 51,029 centerline miles. States and in certain cases, MPOs including DRCOG, are responsible for designating public roads for the CRFCs and CUFCs in accordance with the FAST Act. State designation of the CRFCs is limited to a maximum of 150 miles of highway or 20 percent of the PHFS mileage in the State, whichever is greater. State and MPO designation of the CUFC is limited to a maximum of 75 miles of highway or 10 percent of the PHFS mileage in the State, whichever is greater. Colorado's mileage limits are 160.69 centerline miles statewide for CRFCs and 80.35 centerline miles statewide for CUFCs (for urbanized areas over 50,000 in population). As of fall 2016, DRCOG and CDOT are working together to define the critical freight corridors within the DRCOG region.

CDOT's 2015 State Highway Freight Plan also designates specific freight corridors based on a range of inputs, including truck traffic, connectivity, federal requirements, stakeholder input, and others. In the DRCOG region, CDOT's freight corridors include interstate highways, freeways, and a few major regional arterials, such as US-287, SH-119, and South Santa Fe Drive.

Figure 2
Rail, Air and Intermodal Freight Network
2014



LEGEND

- Union Pacific Railway
- BNSF Railway
- Great Western Railroad
- Denver Rock Island Railroad
- (#) Approximate Number of Trains Per Day (2004)
- National Highway System Connectors
- Rail-Truck Transfer Facility
- Pipeline Terminal
- Rail Yard
- ✈ Air Cargo Operation



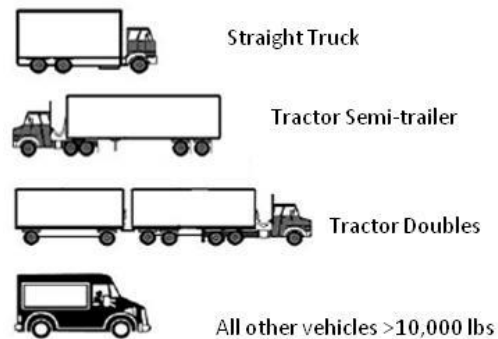
0 5 10
Miles

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Projection: State Plane Colorado Central, NAD 83 (feet)

Attachment 2

1. Trucks/Roadways

The majority of freight movement in the Denver region occurs via commercial vehicles such as trucks and vans across the entire roadway system. Trucks are generally classified as a vehicle with a gross weight greater than 10,000 pounds. For example, a Ford F350 pickup marks the bottom end of the weight threshold.



The MVRTP's 2040 fiscally constrained regional roadway system includes 8,300 lane miles of freeways, tollways, major regional arterials, and principal arterials that serve many of the major freight origin and destination locations. Thousands of additional miles of local roadways provide direct access to the remaining locations. A few roadways are also designated as National Highway System Connectors. They are noted on Figure 8 and provide connections to major multimodal terminals such as airports, rail terminals, truck terminals, pipeline terminals, park-n-Ride lots, bus terminals, and bus stations.

Regulatory and other issues facing truck movements include:

- CDOT regulations and rules for longer combination vehicles (LCVs), trucks that pull more than one trailer;
- Local regulations regarding the time of day that trucks can make deliveries and pickups;
- Weight and winter chain law restrictions on roadways;
- Upgrading the port of entry into Denver to include “smart” technologies for electronic credential checking and weigh-in-motion facilities;
- Increased homeland security concerns—criminal background checks, facility security plans, updating of hazardous material placards on trucks;
- Emergency response to truck crashes, and
- Rest stops, truck stops and parking.

One important but often overlooked regulatory aspect is the conflict between federal “work shift” requirements (the maximum length of a work shift) and CDOT road closures. For example, if CDOT has a winter-time closure in the I-70 mountain corridor, a long-haul trucker cannot extend his work shift to accommodate the time delay from that closure. This type of situation has incident management implications – one illustration of the interconnectedness of the various facets of freight movement.

Attachment 2

2. Commercial Vehicle Volumes

Figures 3 and 4 show 2014 and 2040 forecasted commercial vehicle volumes on the region's major roadways and highways. These data are from DRCOG's *2014 Annual Report on Traffic Congestion in the Denver Region*. As expected, the region's interstates and freeways have the highest volumes of commercial vehicles, though portions of roadways such as South Santa Fe Drive, Parker Road, and Wadsworth Boulevard also have high commercial vehicle volumes. Additionally, relatively lower volume roadways, such as interstates in rural areas, may have a high percentage of commercial vehicle traffic.

Package Delivery – from Seller to Buyer

One key way that commercial vehicles affect our daily lives is in the delivery of packages, particularly with increasing e-commerce. The graphics to the right and below illustrate typical updates offered to consumers to track the delivery status of their packages.

From a goods movement perspective, it is interesting to note how many places a package is transferred to and what modes it may have traveled to reach the consumer. For example, both packages originated in the Midwest and were routed through a carrier facility in Hodgkins, IL (suburban Chicago), and then were likely shipped by truck to a distribution center in Commerce City based on the 1.5 days of transit time. Both packages were then sorted and routed very early the next morning for delivery later that day. This illustrates the multimodal nature of goods movement, logistical complexities, and the importance of reliable travel and delivery times.

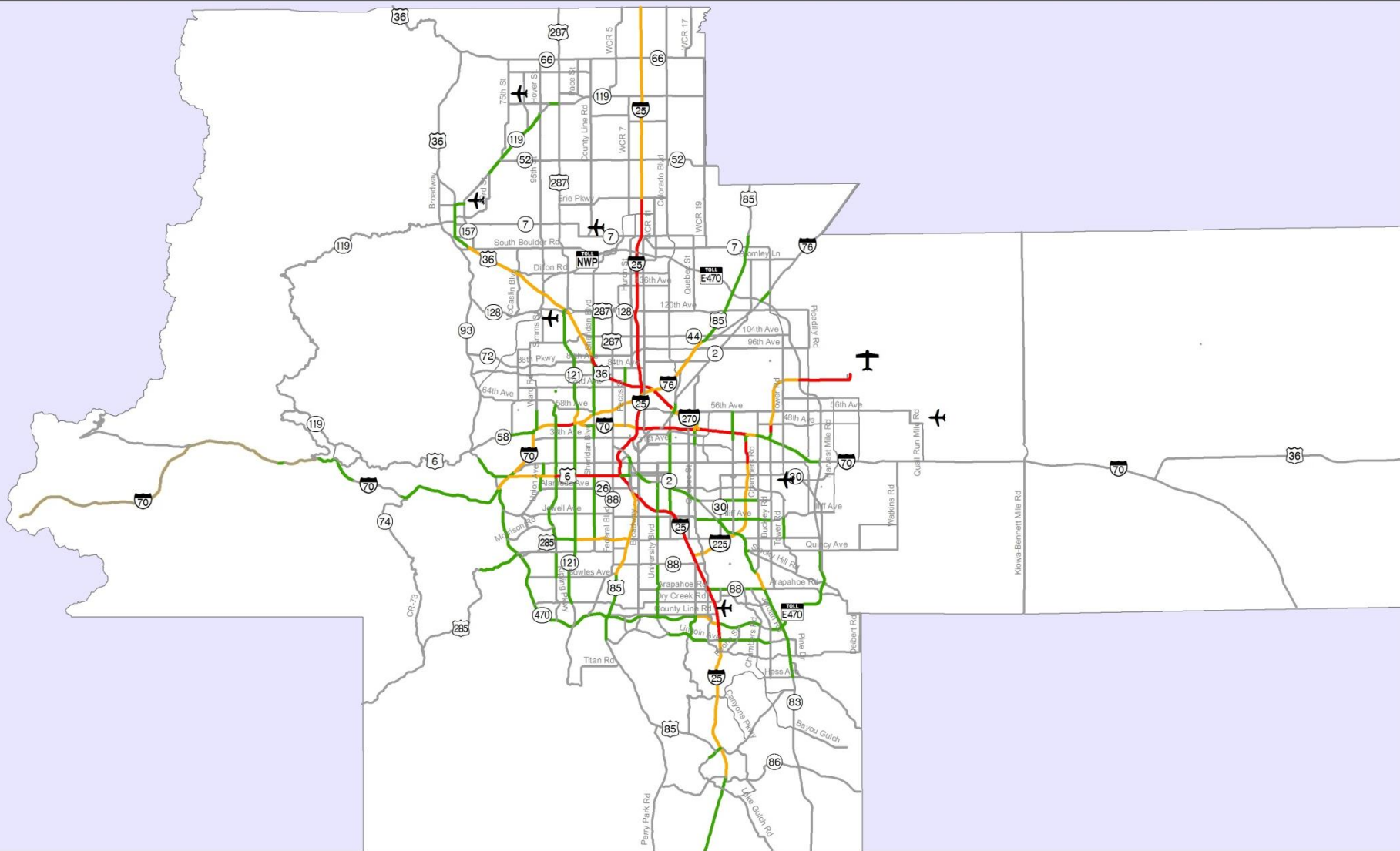
▼ Shipment Progress What's This?			
Location	Date	Local Time	Activity
DENVER, CO, US	10/29/2015	3:39 P.M.	Delivered
Commerce City, CO, United States	10/29/2015	5:22 A.M.	Out For Delivery
	10/29/2015	12:45 A.M.	Arrival Scan
Hodgkins, IL, United States	10/27/2015	5:18 P.M.	Departure Scan
Hodgkins, IL, United States	10/26/2015	10:32 P.M.	Arrival Scan
Shepherdsville, KY, United States	10/26/2015	6:00 P.M.	Departure Scan
	10/26/2015	5:23 P.M.	Origin Scan
United States	10/26/2015	7:41 P.M.	Order Processed: Ready for UPS

Latest update: Wednesday, Nov 4	
2:42 PM	Package was delivered in office The delivery was signed by: SANDI Lakewood, CO, US
1:25 AM	Out for delivery Commerce City, CO, US
1:04 AM	Package received by carrier Commerce City, CO, US
Tuesday, Nov 3	
10:30 PM	Package arrived at a carrier facility Commerce City, CO, US
Monday, Nov 2	
3:41 PM	Package has left the carrier facility Hodgkins, IL, US
3:28 AM	Package arrived at a carrier facility Hodgkins, IL, US
1:12 AM	Package has left the carrier facility Indianapolis, IN, US
Friday, Oct 30	
10:10 PM	Package received by carrier Indianapolis, IN, US
5:04 PM	Package received by carrier Plainfield, IN, US
2:03 PM	Package has left seller facility and is in transit to carrier Plainfield, IN, US

Figure 3

2014 Commercial Vehicle Volumes

Metro Vision Regional Transportation Plan



LEGEND

2014 Commercial Vehicle Volumes per Day

- < 5,000
- 5,000 - 10,000
- 10,000 - 15,000
- > 15,000

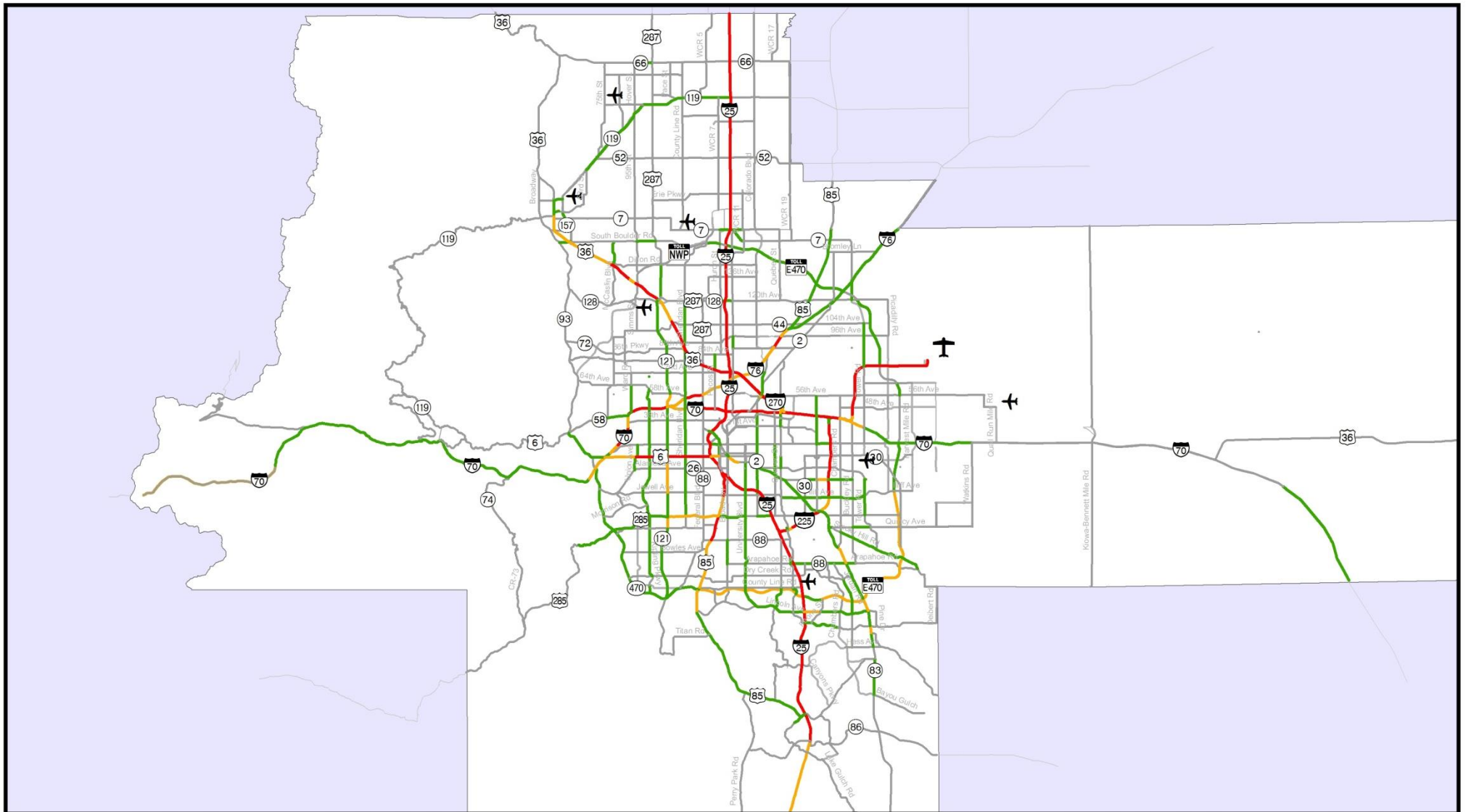


0 5 10
Miles

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Projection: State Plane Colorado Central, NAD 83 (feet)

Figure 4

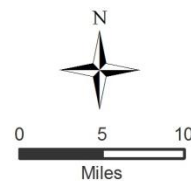
2040 Commercial Vehicle Volumes



LEGEND

2040 Commercial Vehicle Volumes per Day

- < 5,000
- 5,000 - 10,000
- 10,000 - 15,000
- > 15,000

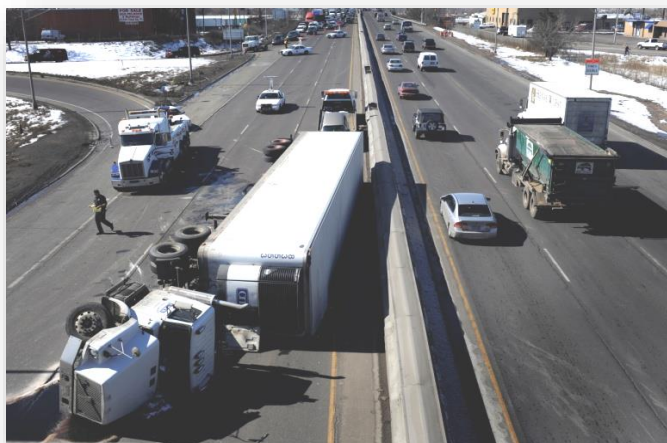


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Attachment 2

3. Crash/Safety

During the most recent three-year period available (2010-2012), there were 6,800 crashes involving trucks in the Denver region, resulting in 159 serious injuries and 34 fatalities (Table 1). Truck-involved crashes made up about four percent of all crashes and three percent of serious injuries, but seven



percent of all fatalities. Between 2010 and 2012, truck-involved crashes increased nine percent, while total crashes increased only three percent. Serious injuries in truck-involved crashes increased 68 percent, while total serious injuries increased nine percent. Finally, between 2010 and 2012, fatalities in truck-involved crashes decreased 23 percent compared to a six percent increase in total fatalities. It is

important to note that crash-related statistics can vary considerably from year to year, and that comparing truck-involved crash trends can be difficult because they make up such a small proportion of total crashes.

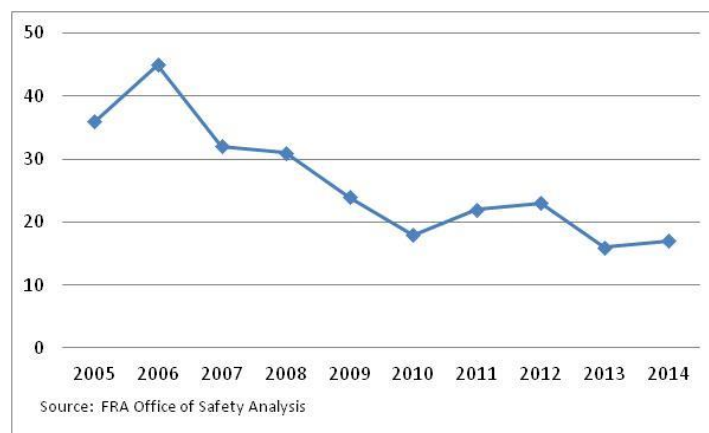
Table 1: Comparison of Truck and Total Crashes (2010-2012)

	Total Crashes		Serious Injuries		Fatalities	
	Number	Percent	Number	Percent	Number	Percent
Trucks	6,800	4%	160	3%	35	7%
All Vehicles	176,300		5,000		500	

Attachment 2

Crashes at railroad crossings are also an important issue. Figure 5 shows the number of railroad crossing crashes statewide from 2005-2014 based on data from the [Federal Railroad Administration's Office of Safety Analysis](#). As shown, the number of crashes has been decreasing significantly. Though the FRA data does not break out fatalities or injuries, it does include other interesting information. For example, for the most recent four year period (2011-2014), automobiles were the largest single category (35 percent) of total crashes at crossings. The BNSF Railway had the highest proportion of crashes (44 percent); RTD rail lines were involved in a single crash during the four year period.

Figure 5: Colorado Railroad Crossing Crashes (2005-2014)

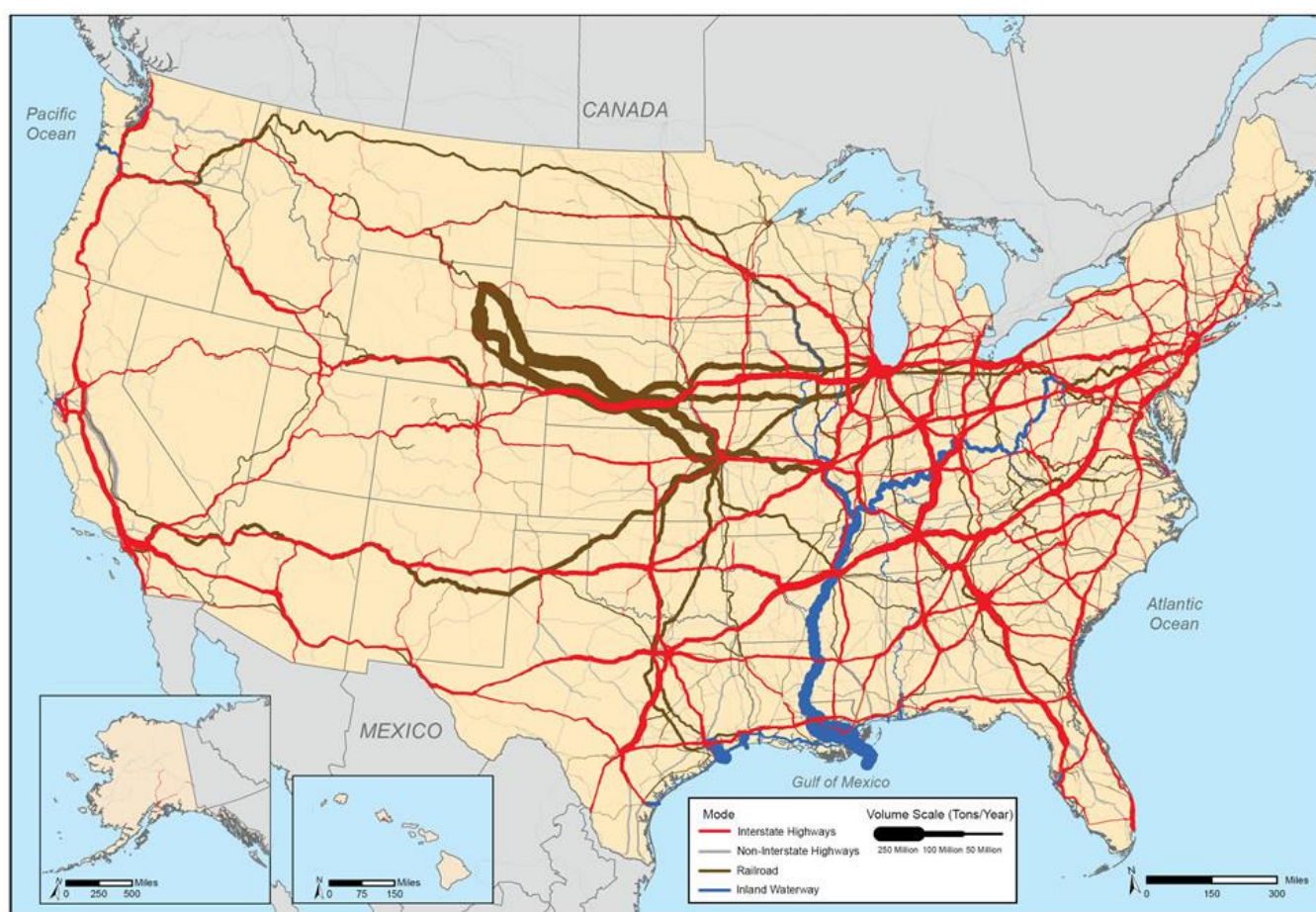


Attachment 2

4. Freight Railroads

Railroad cars carry the most ton-miles of freight in the Denver region. Railroads generally carry heavy and bulky cargo of lesser value per unit of weight. Freight that is hauled by rail instead of trucks causes less damage to the roadway infrastructure. Figure 6 (FHWA) illustrates freight flows by highways, railroads, and waterways for 2010. While Colorado is an important state for connecting long-haul freight shipping, the relative volume of freight passing through the state is less compared with adjacent states.

Figure 6: 2010 Freight Flows by Highway, Railroad, and Waterway



Sources: Highways: U.S. Department of Transportation, Federal Highway Administration, Freight Analysis Framework, Version 3.4, 2013; Rail: Based on Surface Transportation Board, Annual Carload Waybill Sample and rail freight flow assignments done by Oak Ridge National Laboratory; Inland Waterways: U.S. Army Corps of Engineers, Institute of Water Resources, Annual Vessel Operating Activity and Lock Performance Monitoring System data, 2013.

Freight rail traffic in the Denver metropolitan region is dominated by two Class I railroads: Union Pacific (UP) and Burlington Northern Santa Fe (BNSF). Class I railroads are the largest carriers and are designated as such by the Surface Transportation Board of the U.S. Department of Transportation. Two Class III railroads also operate within the Denver region: Denver Rock Island Railroad (DRIR) and Great Western Railway of Colorado (GWR). Active rail lines in the region are illustrated in Figure 8 along with switching yards, multimodal terminals, and major transfer facilities.

Attachment 2

The BNSF railroad's principal line through the Denver region runs north-south carrying the majority of trains from Wyoming to Texas. Its principal cargo is coal. The BNSF operates four branch lines within the region: Golden to Denver, Broomfield-Lafayette, Longmont-Barnett, and a line connecting Denver, northeastern Colorado, and Nebraska to the northeast.

The UP operates major north-south lines and east-west lines within the region. The north-south line connects Denver with Cheyenne and Pueblo. East-west lines connect Denver with Utah and western Colorado to Kansas. RTD purchased from UP the 33-mile branch line connecting Commerce City to the Boulder area. It is active only from Commerce City to just north of 120th Avenue.



The BNSF and UP have joint operations and track sharing agreements south of downtown Denver. The joint line is known as the Consolidated Mainline. It is operated as a paired track; one track used for northbound traffic and the other track used for southbound traffic.

The DRIR has a switching and terminal spur line north of I-25 and 58th Avenue running roughly parallel to I-270 connecting the UP and BNSF facilities. The GWR operates branch lines connecting North Front Range communities such as Fort Collins and Loveland to Longmont. GWR has an interchange point with BNSF at Longmont (switching only).

5. Major Multimodal Terminals

Figure 2 shows the location of the current UP and BNSF multimodal rail-truck transfer facilities. They are also listed in Table 2 below. The BNSF operates the Rennicks and Globeville (31st Street) switching yards. BNSF has major terminals and freight transfer facilities to serve trailers on flat cars (TOFCs) and auto transport. UP has major terminals and freight transfer facilities known as the North Yard, 40th Street Yard, Rolla Auto Transfer Yard, and Pullman Yard, in addition to several switching yards. The National Highway System also includes the following [intermodal connectors](#) in the Denver region:

- RTD Transit Stations: Broadway LRT station, Broomfield Park-n-Ride, Civic Center Station, Denver Union Station (Amtrak), Southmoor Park-n-Ride, Stapleton (now Central Park) Park-n-Ride, Table Mesa Park-n-Ride, Thornton Park-n-Ride, Wagon Road Park-n-Ride, and Westminster Center Park-n-Ride

Attachment 2

- Railroad Facilities: Burlington Northern Railroad Auto/Railroad Transfer Facilities, Southern Pacific Railroad Transfer Facility, Union Pacific Railroad Auto/Railroad Transfer Facilities
- Pipeline Facilities: Conoco Pipeline Transfer, Kanab Pipeline Transfer, Phillips Pipeline, Total Petroleum Pipeline Terminal
- Other Facilities: Denver International Airport, Denver Greyhound Bus Station

Table 2: Existing Multimodal Freight Facilities

Name	Location	Type
Conoco Pipeline Transfer	56 th Ave. and Brighton Rd.	Pipeline Terminal
Kanab Pipeline Transfer	80 th Ave. and W. of SH-2	Pipeline Terminal
BNSF Rennicks Yard	53 rd Ave. and Bannock St.	Rail Yard
BNSF 31 st St. Yard	Globeville Rd. and 38 th St.	Rail Yard
UP Burham (4 th Ave.) Yard	800 Seminole Rd.	Rail Yard
UP Monaco	Smith Rd. and Monaco Pkwy.	Rail Yard
UP Roydale	Smith Rd. and Peoria St.	Rail Yard
UP 36th St. Yard	Wazee St.	Rail Yard
BNSF Big Lift	SH-85 and Louviers Ave.	Rail-Truck Transfer Facility
UP North Yard	901 W. 48 th Ave.	Rail-Truck Transfer Facility
BNSF TOFC Yard	Pecos St. and 56 th Ave.	Rail-Truck Transfer Facility
UP Rolla Auto Transfer	96 th Ave. and US-85	Rail-Truck Transfer Facility
UP 40 th St. Yard	40th Ave. and York St.	Rail-Truck Transfer Facility
BNSF Irondale Auto Transfer	SH-2 and 88 th Ave.	Rail-Truck Transfer Facility
UP Pullman Yard	N. of 40 th Ave. and SE of Brighton Blvd.	Rail-Truck Transfer Facility
BNSF Locomotive Shops	Park Ave., Delgany, and S. Platte River	Rail-Truck Transfer Facility

The appendix contains two “concept examples” of aerial photographs showing multimodal terminals and the major roadway connectors providing access to them. These examples illustrate where these multimodal terminals are located in relation to the region’s multimodal transportation network.

6. Air Cargo

Air cargo activity to and from Denver has grown dramatically over the past 25 years. According to [DIA’s Master Plan](#), total cargo volume is forecast to increase from approximately 310,800 tons in 2006 to approximately 714,000 tons by 2030. The number of all-cargo aircraft operations is forecast to increase

Attachment 2

from about 21,000 in 2006 to about 40,000 in 2030. Air freight is by nature high value and time sensitive and is linked to the types of retail, service, and manufacturing businesses expected to lead the region's economic development in the future. DIA handles thousands of packages and containers per day, with much smaller levels at Centennial, Rocky Mountain Metropolitan, and Front Range Airports. The aviation section contains more detailed information about the region's airport operations and future implications.

7. Pipelines

Pipelines in the Denver region ship in oil products and natural gas. Crude oil is processed into usable fuels such as gasoline and delivered by truck to filling stations. Colorado's only oil refinery is located in Commerce City near I-270. Natural gas is used to generate electricity for homes (heating and cooking) and businesses. Colorado requires investor-owned utilities to obtain 30 percent of their electricity from renewable sources. Pipeline transfer facilities are shown in Figure 2.

8. At-Grade Arterial Railroad Crossings

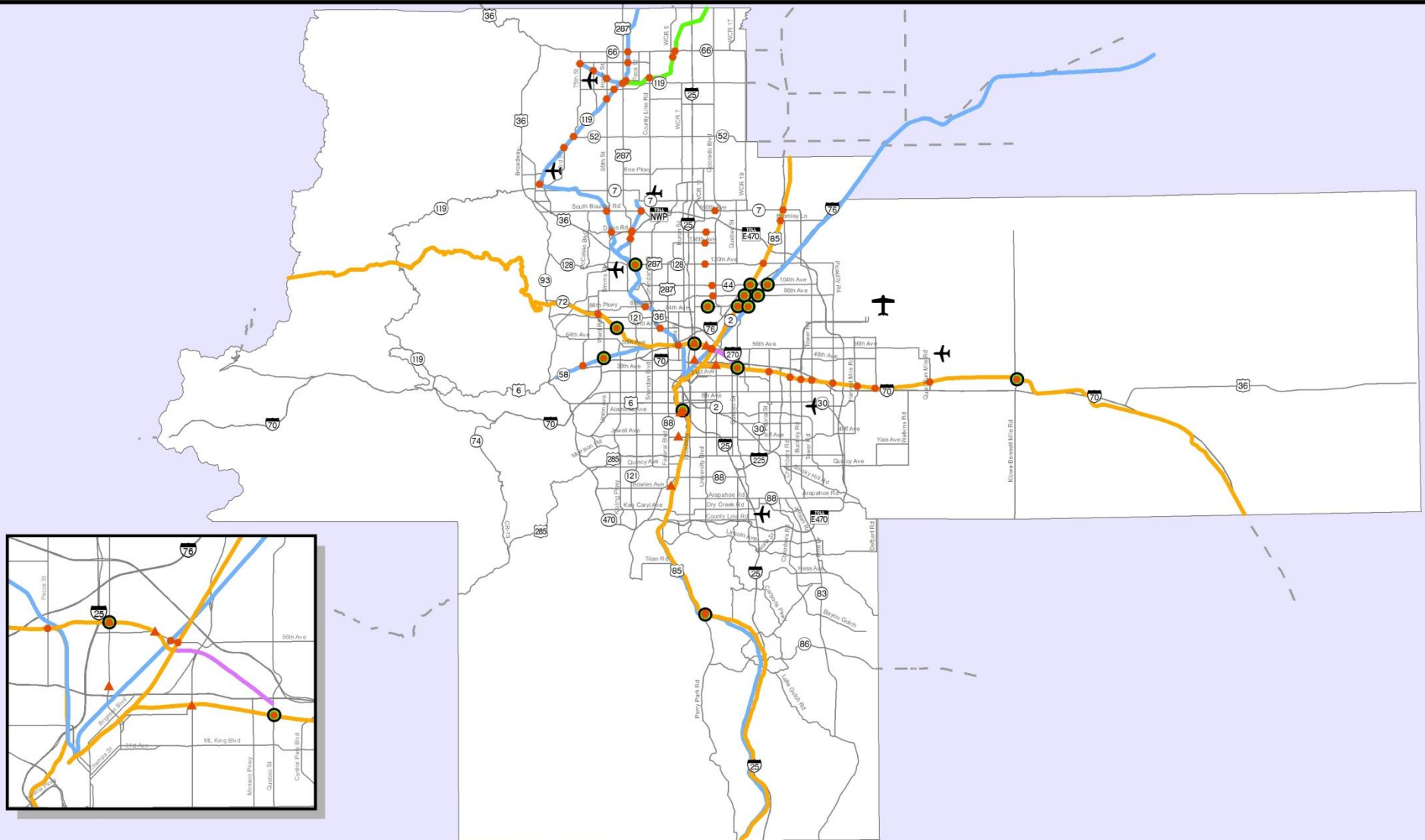
Over 500 at-grade intersections exist between the rail system and the roadway system in the Denver metropolitan region. Many of these at-grade crossings are found north of the I-70 corridor in predominately industrial and warehouse areas. At-grade crossings can pose safety concerns as well as problems of delay to auto and truck traffic and emergency services. The 58 rail-on-roadway crossings on the regional highway network are shown in Figure 7.

The number of trains that cross a road per day will increase on those lines that may serve commuter rail in the future. Corridor studies will determine the need for constructing additional grade-separations at such locations. In recent years, the region has converted several at-grade crossings into grade-separated ones, such as the UP at Wadsworth Bypass/Grandview Avenue, the UP At Pecos Street, the UP/RTD East Rail at Peoria Street, and others.

9. Warehousing

The Denver region is the hub of the state for warehousing and distribution activities. National Quarterly Census of Employment and Wages (QCEW) data show that almost 3,000 firms (with at least 10 employees) are engaged in wholesale trade and warehousing activities in the Denver region. Figure 8 shows the locations and concentrations of wholesale trade and warehousing firms in the Denver region based on the same data, which uses national NAICS employment category codes.

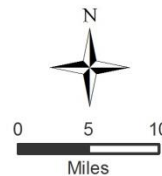
Figure 7
At-Grade Railroad Crossings
on the Regional Roadway System



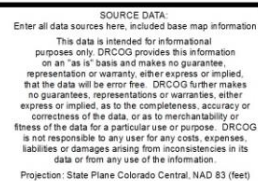
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At-Grade Crossings

- Railroad Main Line
- ▲ Siding/Spur
- Future grade separation
- Roads Outside Region
- Union Pacific Railroad
- BNSF Railway
- Great Western Railroad
- Regional Transportation District (RTD)
- Denver Rock Island Railroad
- Regional Roadway System



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Projection: State Plane Colorado Central, NAD 83 (feet)



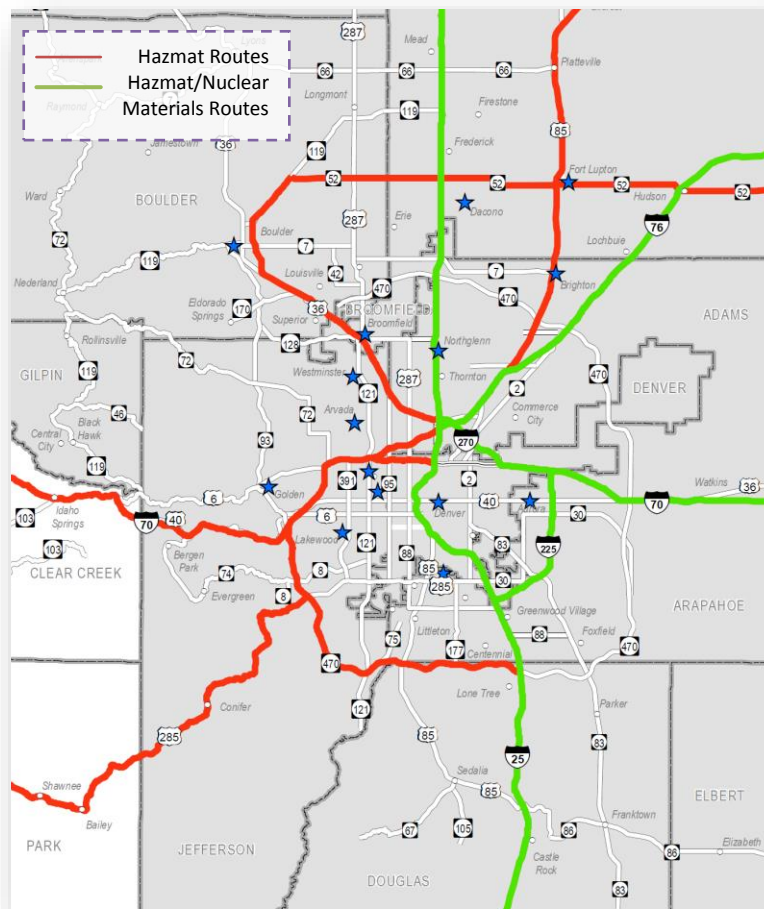
Attachment 2

10. Hazardous Materials

CDOT is responsible for designating hazardous materials (hazmat) routes based on several criteria and policy directives, such as Title 42, Article 20 of the Colorado Revised Statutes and CDOT Policy Directives 1903 and 1903.1. In practical terms, CDOT's Hazmat Advisory Team analyzes whether a proposed route meets several criteria. If so, the Transportation Commission must approve the proposed designation, and then CDOT files a petition with the Colorado State Patrol for final approval. The 12 required criteria consider connectivity, interstate commerce, traffic volumes, safety, surrounding land uses and other factors (see [here](#) for more information).

Figure 9 shows CDOT's graphical representation of hazmat and nuclear materials routes in the DRCOG region. Roadways shown in green are designated hazmat and nuclear materials routes; those in red are hazmat routes only. The stars indicate municipalities that require gasoline, diesel, and liquefied petroleum gas to comply with routing requirements. Designated routes in the Denver region include interstates and portions of US-36, US-85, US-285, C-470, SH-119, and SH-52.

Figure 9: Designated Hazmat & Nuclear Materials Routes

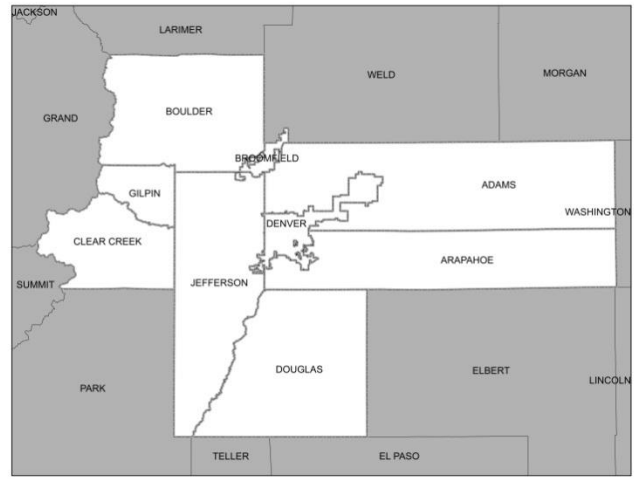


Attachment 2

F. Key Freight Commodity Flow Data

CDOT prepared commodity flow data profiles identifying the top commodities transported by truck into and out of 14 “economic regions” in Colorado. CDOT identifies the Denver economic region as Freight Zone #3 (Figure 10), which corresponds to DRCOG’s planning area except for excluding southwest Weld County. However, additional data for Weld County, where feasible, is included. According to CDOT’s *State Highway Freight Plan*, oil and gas activity is heavily concentrated in Weld County, with over 21,000 active wells (40% of the statewide total). Besides oil and gas, agriculture is a principal industry in Weld County.

Figure 10: CDOT Freight Zone #3



CDOT used the IHS Global Insight, Inc. Transearch 2010 database, consistent with the State Highway Freight Plan, to prepare the commodity flow analysis, which focuses on the top commodities transported by truck by weight in class for 2010 and forecast for 2040. The Transearch database combines the primary shipment data obtained from many of the nation’s largest rail and truck freight carriers with information from public, commercial, and proprietary sources to generate a base year estimate of freight flows at the county level. A separate model is then used to predict 2040 forecasts using proprietary forecasts, as well as using supply and demand factors, including employment, output, and purchases by industry and county. The Transearch forecast focuses on freight tonnage, but a value forecast is also produced, which holds the base year price as fixed.

In preparing the commodity flow data profiles, CDOT determined the top commodities being transported and the top locations where they are being transported to and from. Commodities in the database were grouped using four-digit Standard Transportation Commodity Codes (“STCC”) a system designed by a special committee of the Association of American Railroads (AAR). Currently, the STCC is maintained and published by the AAR and has been updated over the years to meet the needs of its users, particularly the North American Freight Railroads.

Based on CDOT’s analysis, the following tables and maps highlight the top commodities transported on highways within the DRCOG region. Commodities highlighted in light green are considered to be

Attachment 2

secondary traffic, thereby indicating that a commodity is not necessarily produced in that region, but is traveling through it.

1. Transported Out of the Region

Tables 3 and 4 are a list of the top commodities originating in Freight Zone #3 that are transported out of the zone on trucks in 2010. The tables also provide 2040 forecasts. As shown in Table 3, gravel, sand, and concrete products are some of the top individual commodities that originate in and are transported out of the Denver region by weight. In contrast, missile and space vehicle parts, electronic data processing equipment, and malt liquors are the top commodities by value (Table 4).

Table 3: Top Commodities (by Weight) Transported out of Denver Region by Truck

Commodity	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Warehouse & Distribution Center	2,580,580	12%	4,469,500	12%
Gravel or Sand	2,197,050	10%	3,674,070	10%
Ready-mix Concrete, Wet	2,175,630	10%	4,511,520	12%
Concrete Products	1,784,190	8%	3,539,820	10%
Malt Liquors	1,653,190	8%	1,982,880	5%
Asphalt Paving Blocks or Mix	1,035,290	5%	937,950	3%
Other Commodities	10,145,190	47%	17,745,650	48%
Total Tonnage	21,571,120	100%	36,861,390	100%

Attachment 2

Table 4: Top Commodities (by Value) Transported out of Denver Region by Truck

Commodity	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
Warehouse & Distribution Center	\$2,738,910,550	10%	4,743,728,330	6%
Missile or Space Vehicle Parts	\$1,652,912,180	6%	3,668,958,830	5%
Electronic Data Processing Equip.	\$1,565,718,120	5%	7,613,461,930	10%
Malt Liquors	\$1,517,309,710	5%	1,819,391,540	2%
Orthopaedic or Prosthetic Supplies	\$1,004,238,680	3%	4,525,069,570	6%
Rail Intermodal Drayage from Ramp	\$941,645,050	3%	2,473,170,180	3%
Misc. Plastic Products	\$845,860,200	3%	2,028,632,810	3%
Drugs	\$687,976,570	2%	2,477,405,670	3%
Solid State Semiconductors	\$169,017,800	1%	5,741,746,760	8%
Other Commodities	\$17,700,284,860	61%	38,781,659,150	52%
Total Value	\$28,823,873,720	100%	73,873,224,770	100%

Table 5 shows the tonnage and value breakdown of commodity flows by mode exported from Freight Zone #3 in 2010, as well as 2040 forecasts. Most freight is exported from the Denver region by truck in terms of both tonnage and value – about 98 percent by either measure. The 2040 forecasts are very similar. This does not mean that rail, air, and other modes are not important, but it does underscore the importance of the region’s highways, roadways, and streets to freight and goods movement.

Table 5: Total Commodities Exported from Denver Region by Tonnage, Value, and Mode

Mode Split	2010		2040	
	Tonnage	Value	Tonnage	Value
Truck	21,188,500	\$27,423,589,220	36,179,390	\$70,083,469,740
Rail	257,190	\$99,909,760	483,550	\$211,445,410
Air	124,830	\$609,301,600	195,030	\$1,079,716,150
Other	600	\$3,096,570	3,420	\$21,187,800
Totals	21,571,120	\$28,135,897,150	36,861,390	\$71,395,819,100

Attachment 2

Figures 11 and 12 show the top in-state destinations for commodities transported out of the Denver Region by tons (Figure 9) and by value (Figure 10) for both 2010 and 2040. As noted previously, CDOT groups all of Weld County in a different freight zone “economic region” than the rest of the DRCOG region. Even if CDOT had grouped southwest Weld County in Freight Zone #3, the results of Figures 11 and 12 would not likely change.

Figure 11: Top Colorado Destinations of Denver Region Exports by Tons in 2010 and 2040

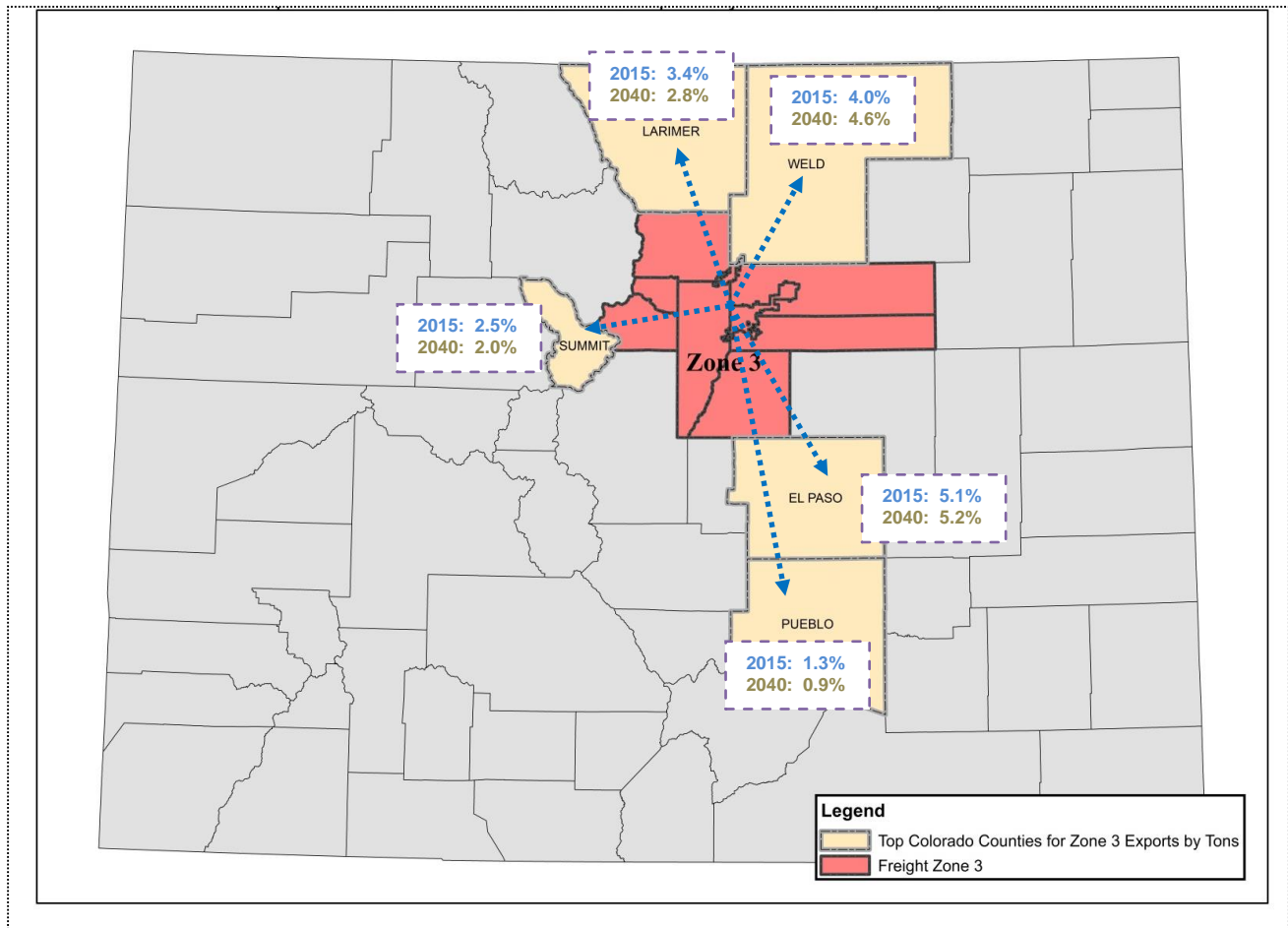
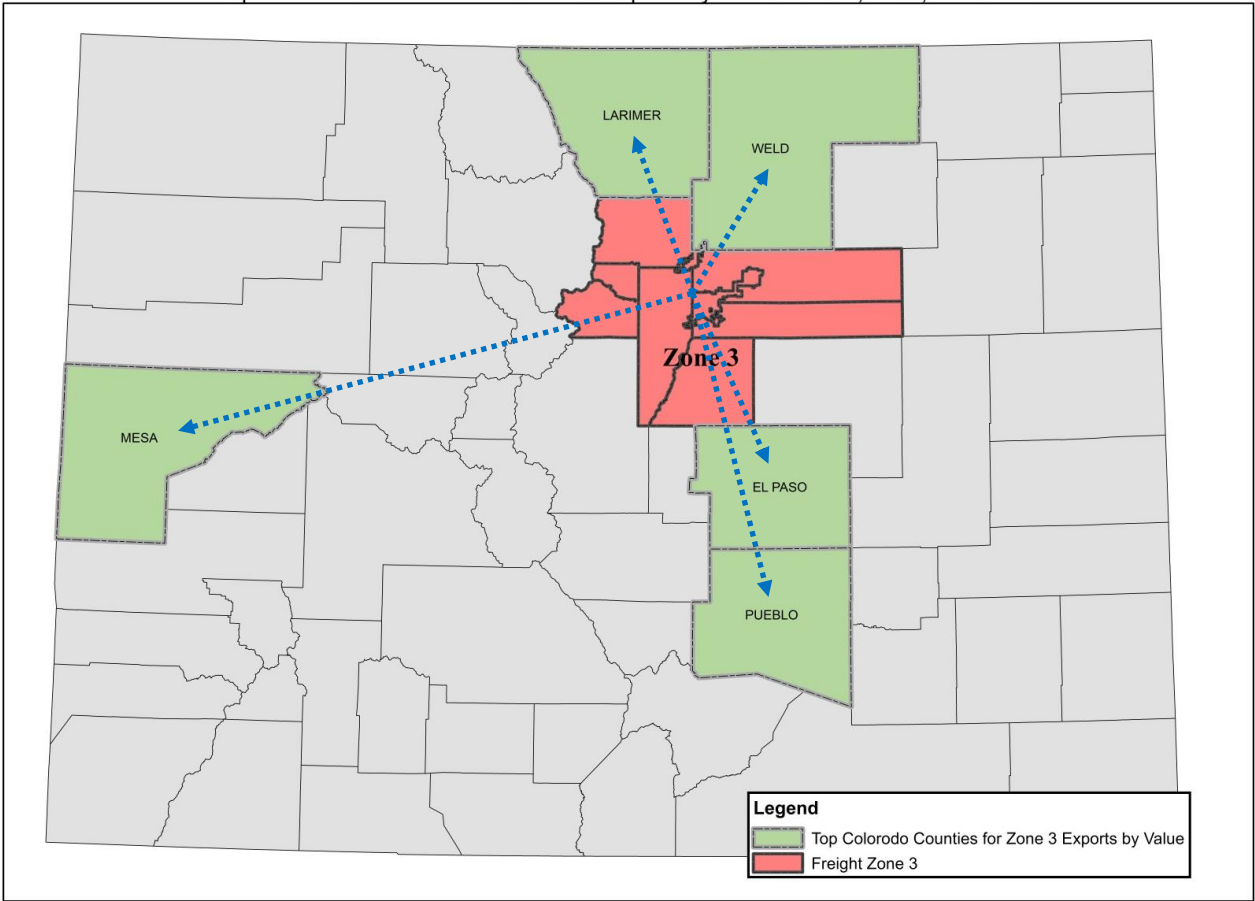


Figure 12: Top Colorado Destinations of Denver Region Exports by Value in 2010 and 2040



Attachment 2

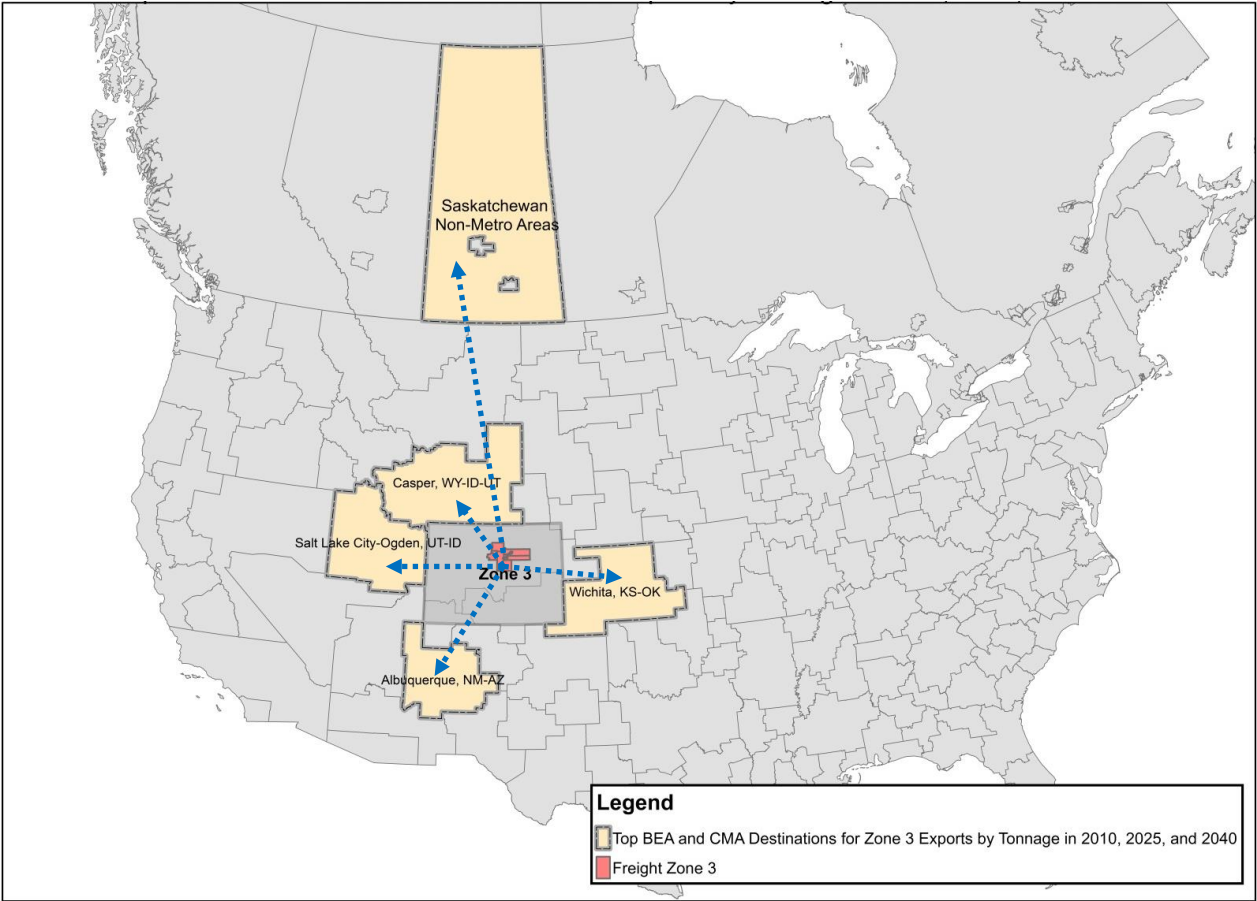
2. Transported out of State

Table 6 and Figure 13 show the top out of state destinations for commodities originating within and exported from the Denver Region by truck, by weight in tons for 2010 and 2040. As shown, the Casper, Wyoming, region (known as Business Economic Area, or BEA) is the top export destination, both in 2010 and forecasted for 2040. The top five BEA destinations for DRCOG region commodity exports do not change between 2010 and 2040, though their ranking changes slightly (between Albuquerque BEA and Wichita BEA). Table 7 and Figure 14 show similar information, by commodity value.

Table 6: Top Out of State Destinations (by Weight) of Denver Region Exports by Truck

Business Economic Area (BEA)	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Wyoming Portion of Casper BEA	1,318,840	16%	2,176,950	15%
Utah Portion of Salt Lake City BEA	949,770	12%	1,565,610	11%
New Mexico Portion of Albuquerque BEA	375,840	5%	634,920	4%
Kansas Portion of Wichita BEA	329,690	4%	664,540	5%
Non-CMA Saskatchewan	239,770	3%	428,960	3%
Other Destinations	4,899,770	60%	8,777,940	62%
Total Tonnage	8,113,680	100%	14,248,920	100%

Figure 13: Top Out of State Destinations of Denver Region Exports by Tons in 2010 and 2040

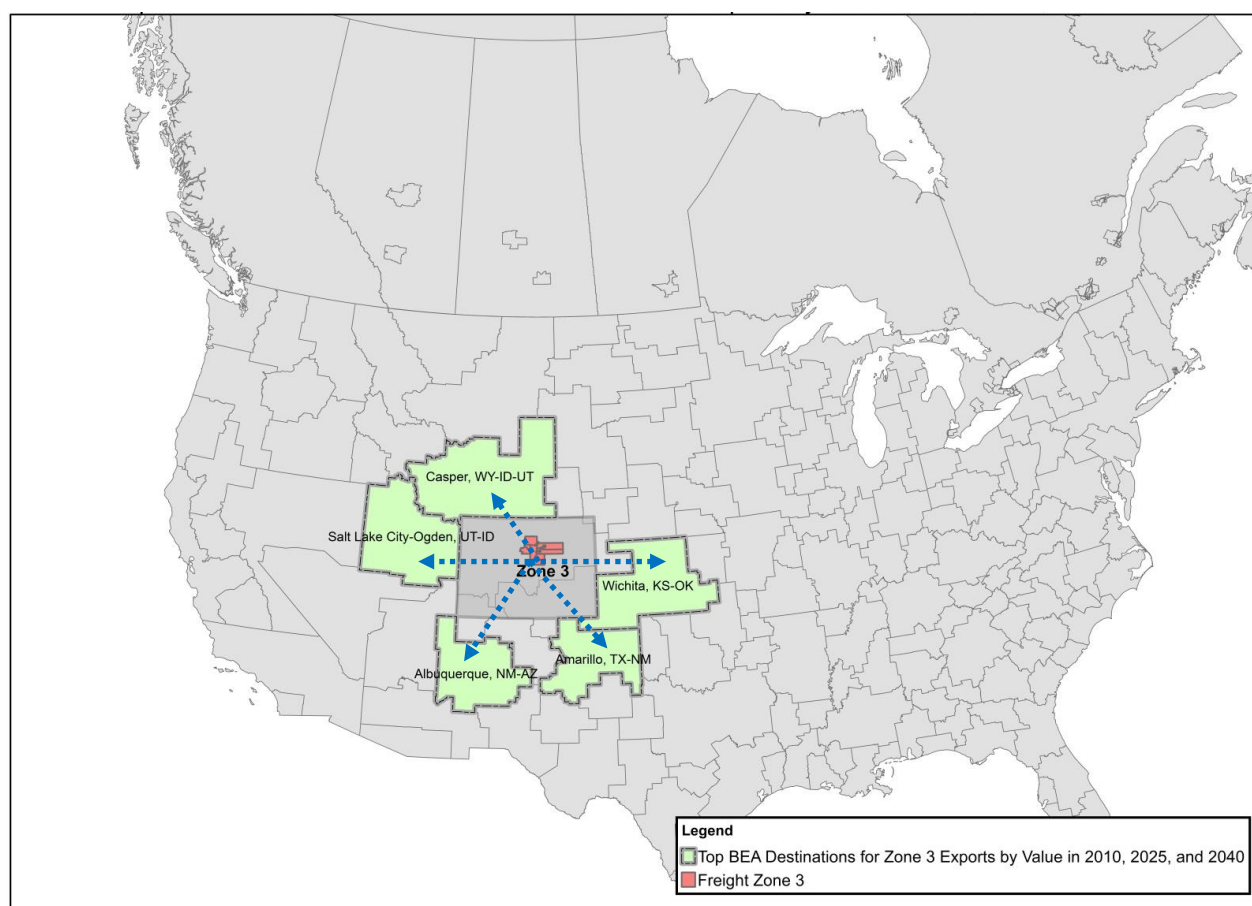


Attachment 2

Table 7: Top Out of State Destinations (by Value) of Denver Region Exports by Truck

Business Economic Area (BEA)	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
Wyoming Portion of Casper BEA	\$1,828,477,320	9%	\$3,743,802,300	7%
Utah Portion of Salt Lake City BEA	\$1,775,745,960	9%	\$3,253,535,190	6%
New Mexico Portion of Albuquerque BEA	\$1,292,333,840	7%	\$2,909,081,890	5%
Kansas Portion of Wichita BEA	\$1,150,107,780	6%	\$3,580,855,490	7%
Texas Portion of Amarillo BEA	\$752,754,740	4%	\$2,184,338,060	4%
Other Destinations	\$12,633,129,260	65%	\$38,185,693,000	71%
Total Value	\$19,432,548,900	100%	\$53,857,305,930	100%

Figure 14: Top Out of State Destinations of Denver Region Exports by Value in 2010 and 2040



Attachment 2

3. Transported Into the Region (from in-state)

Tables 8 and 9 are a list of the top commodities imported into the DRCOG region (Freight Zone #3) by truck for 2010 and 2040 (forecast). As shown in Table 8, crude petroleum, gravel, sand, and concrete products are some of the top individual commodities by weight that are transported into the Denver region by truck. Crude petroleum is also one of the top commodities by value, along with petroleum refining products, plastics products, and electronic data processing equipment (Table 9).

Table 8: Top Commodities (by Weight) Transported into the Denver Region by Truck

Commodity	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Crude Petroleum	5,493,840	12%	7,615,930	10%
Warehouse & Distribution Center	4,668,530	10%	13,960,910	18%
Gravel or Sand	4,347,910	10%	6,445,850	8%
Ready-mix Concrete, Wet	3,837,630	8%	8,628,340	11%
Broken Stone/Riprap	3,191,810	7%	4,923,360	6%
Grain	3,070,240	7%	4,121,570	5%
All Other Commodities	20,939,370	46%	33,454,150	42%
Total Tonnage	45,549,330	100%	79,150,110	100%

Table 9: Top Commodities (by Value) Transported into the Denver Region by Truck

Commodity	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
Warehouse & Distribution Center	\$4,954,965,870	10%	14,817,486,140	12%
Crude Petroleum	\$2,333,185,230	5%	3,234,418,240	3%
Petroleum Refining Products	\$1,793,903,510	3%	1,270,911,540	1%
Misc. Plastic Products	\$1,497,621,040	3%	2,488,609,190	2%
Electronic Data Processing Equip.	\$1,367,234,890	3%	5,288,313,520	4%
Cash Grains, NEC	\$1,062,393,230	2%	1,238,915,990	1%
Drugs	\$856,487,510	2%	3,894,871,780	3%
Solid State Semiconductors	\$743,859,160	1%	22,645,608,370	18%
Radio or TV Transmitting Equip.	\$647,978,110	1%	3,749,756,770	3%
Other Commodities	\$36,291,372,900	70%	68,202,299,000	54%
Total Value	\$51,549,001,450	100%	126,831,190,540	100%

Attachment 2

Table 10 shows the tonnage and value breakdown of commodity flows by mode transported into the DRCOG region in 2010, as well as 2040 forecasts. As with exports (Table 5), most freight is imported into the Denver region by truck in terms of both tonnage and value – about 98 percent by either measure. The 2040 forecasts are very similar. As noted previously, this does not mean that rail, air, and other modes are not important, but it does underscore the importance of the region’s highways, roadways, and streets to freight and goods movement.

Table 10: Total Commodities Transported into the Denver Region by Tonnage, Value, and Mode

Mode Split	2010		2040	
	Tonnage	Value	Tonnage	Value
Truck	21,188,500	\$27,423,589,220	36,179,390	\$70,083,469,740
Rail	257,190	\$99,909,760	483,550	\$211,445,410
Air	124,830	\$609,301,600	195,030	\$1,079,716,150
Other	600	\$3,096,570	3,420	\$21,187,800
Totals	21,571,120	\$28,135,897,150	36,861,390	\$71,395,819,100

Figures 15 and 16 show the top in-state origins for commodities transported into the Denver Region by tons (Figure 15) and by value (Figure 16) for both 2010 and 2040. As noted previously, CDOT groups all of Weld County in a different freight zone “economic region” than the rest of the DRCOG region. Even if CDOT had grouped southwest Weld County in Freight Zone #3, the results of Figures 15 and 16 would not likely change.

Attachment 2

Figure 15: Top Colorado Origins of Commodities Transported into the Denver Region by Tons in 2010 and 2040

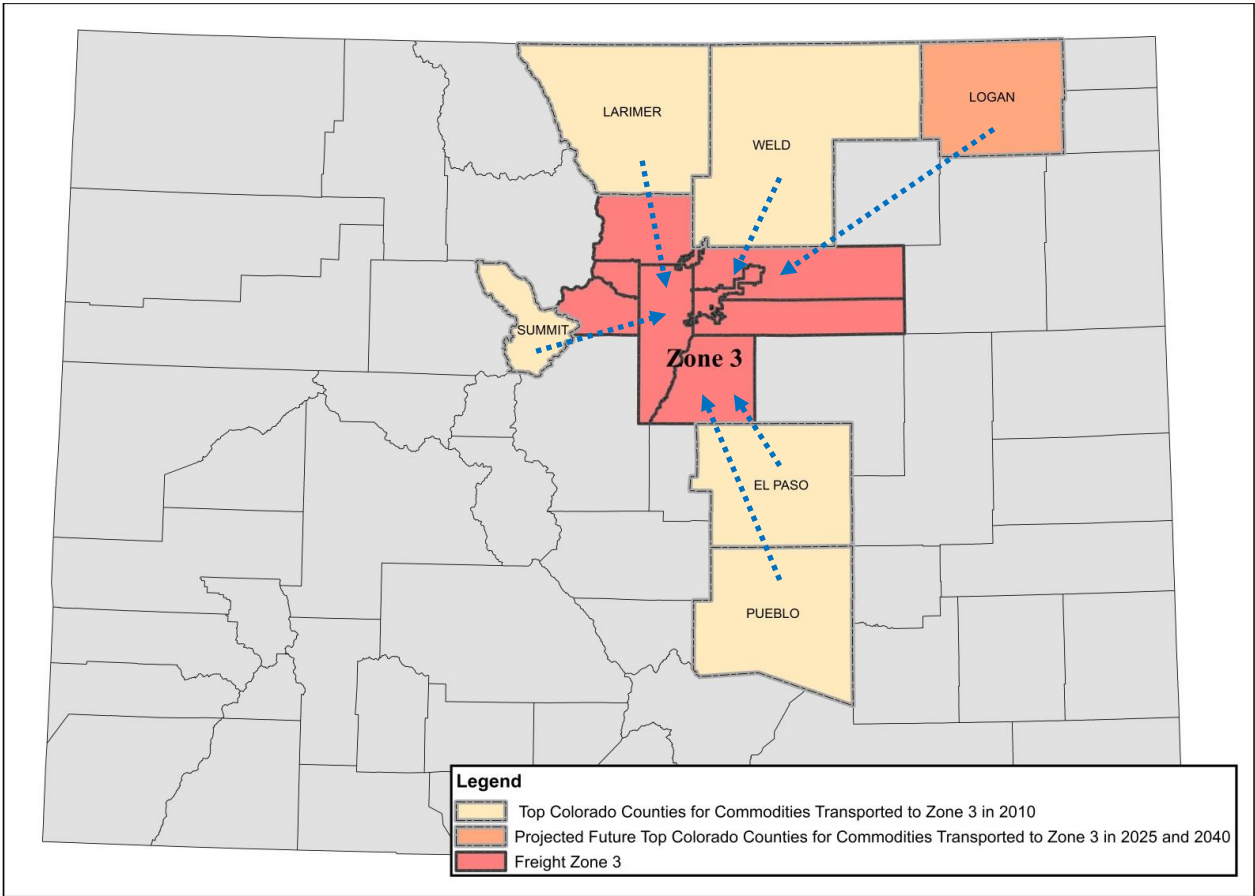
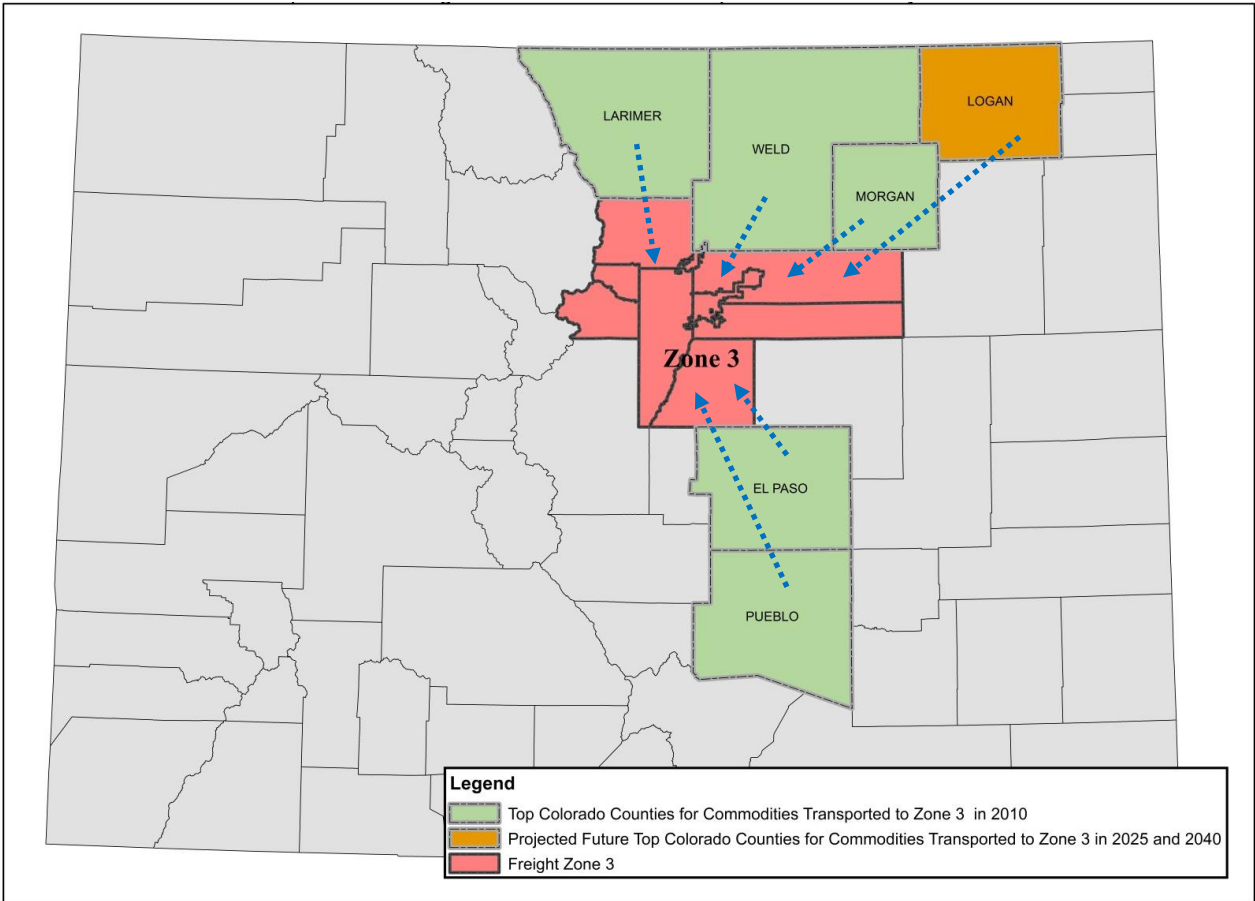


Figure 16: Top Colorado Origins of Commodities Transported into the Denver Region by Value in 2010 and 2040



Attachment 2

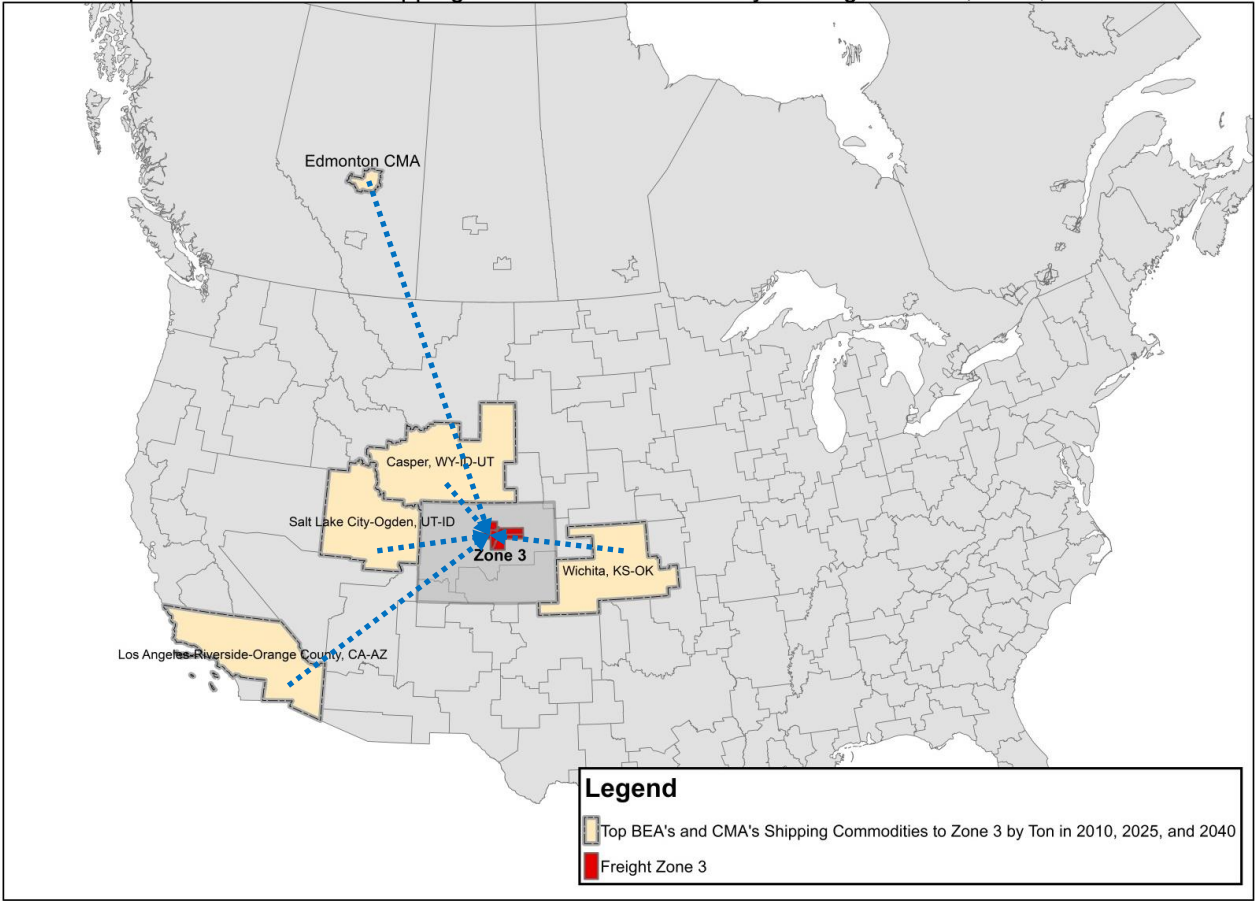
4. Transported Into the Region (from out of State)

Table 11 and Figure 17 show the top out of state origins for commodities transported into the Denver Region by truck, by weight in tons for 2010 and 2040. As shown, the Edmonton, Alberta region is the top import origin, both in 2010 and forecasted for 2040. The top five destinations for DRCOG region commodity imports do not change significantly between 2010 and 2040, though their ranking changes slightly. Table 12 and Figure 18 show similar information, by commodity value.

Table 11: Top Out of State Destinations (by Weight) of Denver Region Exports by Truck

Business Economic Area (BEA)	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Edmonton, Alberta CMA	5,504,500	26%	7,655,840	20%
Utah Portion of Salt Lake City BEA	1,235,940	6%	2,490,820	7%
California Portion of Los Angeles BEA	1,149,340	5%	2,555,990	7%
Kansas Portion of Wichita BEA	995,650	5%	2,274,530	6%
Wyoming Portion of Casper BEA	801,670	4%	1,415,520	4%
Other Origins	11,274,290	54%	21,897,760	57%
Total Tonnage	20,961,390	100%	38,290,460	100%

Figure 17: Top Out of State Origins of Denver Region Imports by Tons in 2010 and 2040

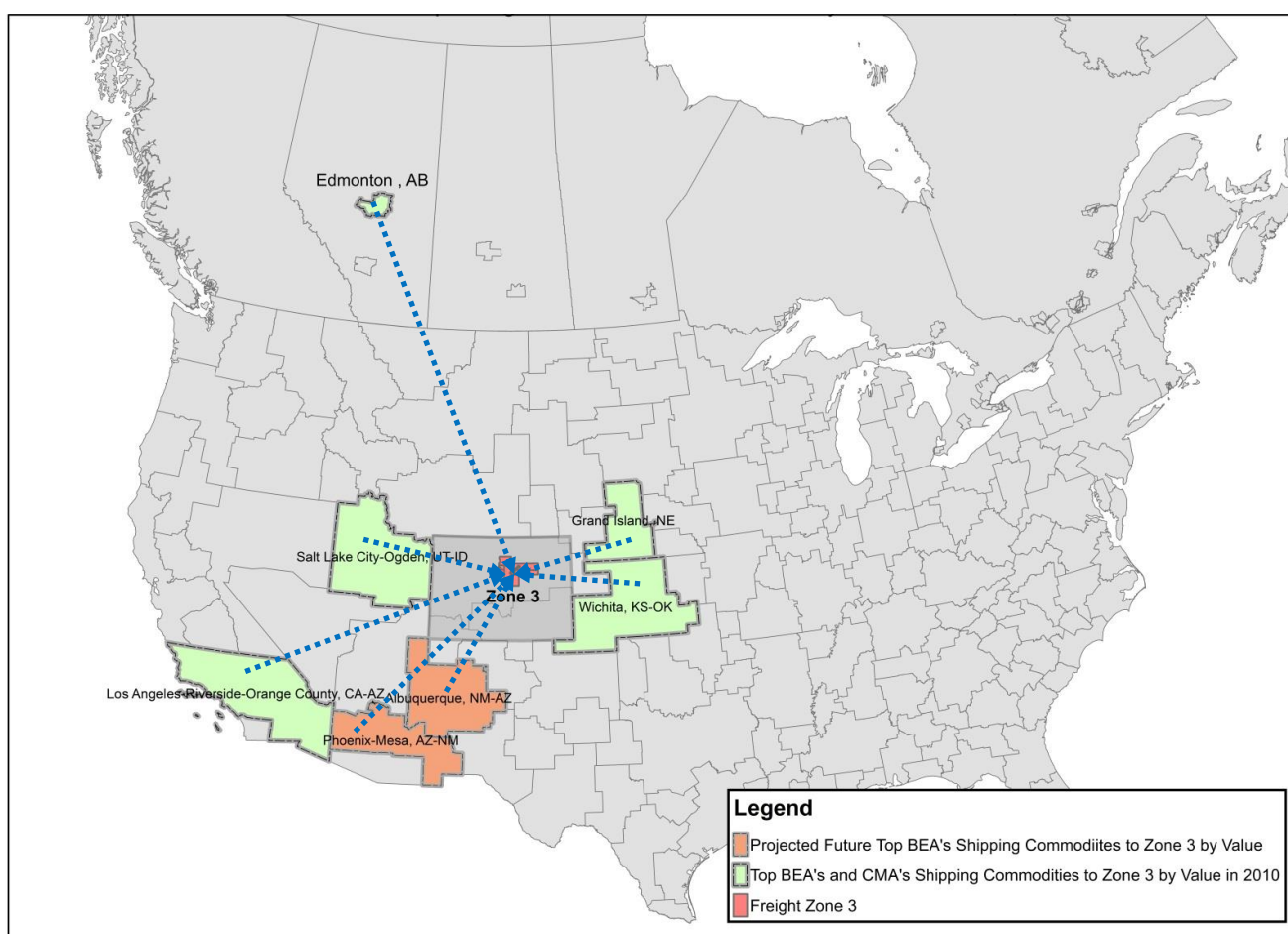


Attachment 2

Table 12: Top Out of State Origins (by Value) of Denver Region Imports by Truck

Business Economic Area (BEA)	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
California Portion of Los Angeles BEA	\$7,489,348,240	18%	\$18,790,425,150	17%
Utah Portion of Salt Lake City BEA	\$4,999,349,150	12%	\$20,284,254,420	19%
Edmonton, Alberta CMA	\$2,362,353,550	6%	\$3,351,652,410	3%
Kansas Portion of Wichita BEA	\$1,676,616,910	4%	\$3,769,683,340	3%
Grand Island, Nebraska BEA	\$1,278,166,320	3%	\$2,551,631,130	2%
New Mexico Portion of Albuquerque BEA	\$681,291,780	2%	\$5,523,340,610	5%
Arizona Portion of Phoenix BEA	\$439,420,810	1%	\$4,848,587,270	4%
Other Origins	\$21,929,858,150	54%	\$48,805,180,950	45%
Total Value	\$40,856,404,910	100%	\$107,924,755,280	100%

Figure 18: Top Out of State Origins of Denver Region Imports by Value in 2010 and 2040



Attachment 2

5. Transported Within the Region

Tables 13 and 14 show the top commodities with both an origin and destination within the DRCOG region (Freight Zone #3) that were shipped on trucks for 2010, and 2040 forecasts. Table 13 shows the information by weight; Table 14 shows the information by commodity value.

Table 13: Top Commodities by Weight with Origins and Destinations in DRCOG Region

Commodity	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Gravel or Sand	9,629,660	26%	15,925,380	26%
Broken Stone/Riprap	7,089,910	19%	12,548,350	20%
Warehouse & Distribution Center	4,067,040	11%	6,763,940	11%
Ready-mix Concrete, Wet	3,286,600	9%	5,399,580	9%
Petroleum Refining Products	1,869,100	5%	2,144,570	3%
Asphalt Paving Blocks or Mix	1,519,850	4%	1,371,450	2%
Concrete Products	1,491,560	4%	2,636,600	4%
Rail Intermodal Drayage from Ramp	1,270,730	3%	3,386,910	6%
Other Commodities	7,137,340	19%	11,132,710	18%
Total Tonnage	37,361,790	100%	61,309,490	100%

Table 14: Top Commodities by Value with Origins and Destinations in DRCOG Region

Commodity	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
Rail Intermodal Drayage from Ramp	\$5,374,774,700	24%	14,325,566,410	31%
Warehouse & Distribution Center	\$4,316,578,420	19%	7,178,946,820	15%
Rail Intermodal Drayage to Ramp	\$1,866,509,330	8%	4,656,595,880	10%
Petroleum Refining Products	\$1,707,505,090	7%	1,959,154,690	4%
Drugs	\$980,875,800	4%	3,292,437,990	7%
Missile or Space Vehicle Parts	\$918,236,870	4%	2,988,822,500	6%
Mail and Express Traffic	\$776,770,930	3%	612,344,870	1%
Air Freight Drayage to Airport	\$553,175,460	2%	653,062,740	1%
Bread or Other Bakery Products	\$517,063,430	2%	779,363,600	2%
Other Commodities	\$5,775,282,160	25%	10,053,149,680	22%
Total Value	\$22,786,772,190	100%	46,499,445,180	100%

Attachment 2

Finally, Table 15 shows the percentage of commodities that have both an origin and destination within the DRCOG region by year, by both weight and value.

Table 15: Commodities that Stay Within the DRCOG Region

Year	Tonnage	Value
2010	55%	29%
2025	56%	26%
2040	53%	23%

Attachment 2

G. MVRTP Freight-Related Transportation Improvements

One of the most consistent feedback themes provided by freight stakeholders over time is the importance of travel time reliability and the impact of congestion on freight and goods movement. The following roadway system improvement project types contained in the MVRTP will directly benefit the movement of freight by decreasing congestion and improving travel time reliability:

- Expand the regional roadway system (add nearly 1,200 lane-miles) by widening roads, removing bottlenecks, and constructing new roads and interchanges;
- Construct railroad crossing grade-separations at critical locations;
- Provide roadway management and Intelligent Transportation System applications such as traveler information systems, incident management, and variable message signs, and
- Efficiently operate, maintain, and repair roadways and other transportation facility assets so that freight and all traffic can travel smoothly and safely.

The following examples of regionally significant roadway capacity projects in the 2040 Fiscally Constrained RTP will specifically benefit freight and goods movement because they are located on roadways that are either designated freight corridors, provide access to multimodal freight terminals, have a large volume of commercial vehicles, or are otherwise important to freight and goods movement:

- I-25 (US-36 to SH-7): add managed lanes – opened in 2016
- I-25 (Santa Fe Dr. to US-6): interchange capacity
- I-70 (Brighton Boulevard to Chambers Rd.): add 2 new managed lanes
- I-70 (Empire Junction (US-40) to Twin Tunnels): add peak period shoulder managed lanes
- I-270 (I-25 to I-70): widen from 4 to 6 lanes
- I-270/Vasquez Blvd: interchange capacity
- US-36 (I-25 to Table Mesa Dr.): add managed lanes – opened in 2015
- US-85 (Highlands Ranch Pkwy. to County Line Rd.): widen from 4 to 6 lanes
- C-470 (Kipling Pkwy. to I-25): add toll managed lanes
- SH-2 (72nd Ave. to I-76): widen from 2 to 4 lanes
- Pena Blvd. (I-70 to E-470): widen from 4 to 8 lanes
- 88th Ave. (I-76 to SH-2): widen from 2 to 4 lanes

The MVRTP includes the following projects, strategies, and concepts to benefit the freight railroad system:

- **Eastern railroad bypass.** CDOT concluded the Colorado Rail Relocation Implementation Study (aka R2C2 Study) in 2009. Two alternative alignments were determined to have a positive benefit-

Attachment 2

to-cost ratio. Either alignment could result in a diversion of a substantial amount of freight rail traffic that currently uses the Consolidated Mainline through the Denver region.

- **Railroad grade-separation bridges/underpasses on the regional roadway system** at the following example locations:
 - BNSF at 88th Avenue
 - BNSF at 96th Avenue
 - BNSF at 104th Avenue
 - BNSF at SH-67 and UP at SH-67 (Sedalia)
 - BNSF/UP at Santa Fe Drive/Kalamath Street
 - RTD at 88th Avenue
 - UP at 72nd Avenue
 - UP at 88th Avenue
 - UP at 96th Avenue
 - UP at 104th Avenue
 - UP at Broadway (SH-53)
 - UP at Quebec Street frontage road ramps
 - UP at SH-79
 - UP at Washington Street
- **Railroad grade-separations on local streets off the regional roadway system** will also be considered at critical locations.

DRCOG's Transportation Improvement Program (TIP) also contains many multimodal transportation projects that will address and benefit freight and goods movement, such as the US-36 managed lanes project. The TIP implements the MVRTP and identifies all transportation projects to be completed in the Denver region over a six-year period with federal, state, or local funds.

There are other improvements that will be implemented as components of larger-scale projects built by CDOT or by local governments:

- Improve intersection turning radii at busy locations where trucks have difficulty making turns;
- Construct or widen shoulders to provide adequate space for trucks to pull over;
- Reconstruct bridges to handle typical truck load weights, and
- Construct additional rest areas or expand parking at existing areas on the outskirts of the Denver region.

Attachment 2

The City of Denver reached agreement in 2015 with adjacent jurisdictions to begin developing an “aerotropolis” around DIA. Potential freight implications include air cargo and airport-related storage, warehouse, transfer and other facilities for higher-value goods.

Land owners in the vicinity of Front Range Airport have proposed a new air/rail/highway multimodal facility known as Spaceport Colorado. Planned or envisioned improvements that will benefit terminals include:

- Widening of several regional system roadways that are located in the vicinity of multimodal terminals; and
- Constructing new multimodal freight centers to handle truck/rail transfers and relocate some existing multimodal terminals.

H. Operations & Technology

Operations and technology are important aspects of freight and goods movement. The overall objective of transportation system management and operation (TSM&O) strategies is to safely provide more reliable trip travel times and reduce the amount of delay faced by drivers, passengers, trucks, and commercial vehicles on the roadway and transit system. The strategies also have a positive impact on safety and air quality. Roadway operational improvement projects are generally low to moderate cost and do not explicitly add significant new capacity to the system. These improvements cost-effectively reduce delay, improve traffic flow (such as by reducing bottlenecks), and increase safety – all important benefits to freight and goods movement and the shipping and delivery of goods and services. As another example, the National ITS Architecture includes components on carrier operations and fleet management, cargo movement and condition, roadside safety, driver security, hazmat management, and commercial vehicle tracking.

Technology is important in many ways, such as real-time traffic/travel and weather data and managing fleet deployment and payload logistics. Connected vehicle applications are an emerging technology that are working to address such topics as curve speed warnings, oversize vehicle warnings, and smart roadside wireless inspection. CDOT recently unveiled its [RoadX](#) initiative to use innovative technology to improve transportation system safety, mobility, and efficiency. Such technology could include smart device apps, connected vehicles, truck platoons linked through technology, virtual guardrails, and others. CDOT will initially invest \$20 million to start RoadX and partner with the private sector to evolve the program.

Attachment 2

Additionally, e-commerce has become a significant share of the retail market, 6 percent, or more than \$1 trillion worth of goods worldwide in 2014. Rapid growth is expected to continue. To keep up with demand, retailers are looking beyond giant warehouses on the peripheries of metropolitan areas. While there will still be demand for those types of warehouses, smaller sites are popping up in places within a 10 to 30-minute drive from central business districts. These sites tend to be smaller; often there are move-in ready sites available. Because of their central location, these sites are sometimes referred to as “last-mile terminals” as they enable shorter delivery turnarounds to places where there is more



Credit: CNN/Amazon

population density¹. Relatedly, drone delivery is an emerging concept being investigated by e-commerce companies like Amazon. These and other emerging and rapidly-evolving technologies could potentially revolutionize freight travel and delivery; at the same time, their transportation and mobility implications are still unknown.

In light of growing urban freight delivery demand, the City of Seattle is teaming up with Costco, Nordstrom, and UPS to rethink the management of traffic congestion, curbs, sidewalks, parking, and other infrastructure through University of Washington’s new Urban Freight Lab. This lab will test more efficient methods to deliver goods ordered online to large retail and commercial buildings. Possible strategies could include centralized drop-off lockers and curb space management².

I. Air Quality Concerns with Freight Movement

The economic benefit of freight travel is not without environmental impacts, particularly to the region’s air quality. A large percentage of heavy trucks are powered by diesel engines. The state Air Pollution Control Division (APCD) estimates that heavy-duty diesel vehicles are responsible for about 50 percent of the primary PM₁₀ emissions from motor vehicles. Similarly, heavy-duty diesel engines are a large contributor to NO_x emissions. Continued improvements to diesel engines and fuels, including alternative fuels to the extent practical to the freight industry, will result in cleaner running trucks. Improvements that reduce roadway and rail congestion will also result in less pollution from truck and rail operations.

In August 2016 the U.S. Environmental Protection Agency and the DOT’s National Highway Traffic Safety Administration jointly finalized standards for medium- and heavy-duty vehicles that would improve fuel

¹ Nate Berg, “The E-Commerce Revolution: Online Boom Testing Infrastructure’s Limits”, *In Transition*, Winter 2016, Volume 25, 4-13

² Associated Press, “New Seattle freight lab tackles urban delivery congestion”, *Denver Post*, Oct. 15, 2016 (<http://www.denverpost.com/2016/10/15/seattle-freight-lab-urban-delivery-congestion/>)

Attachment 2

efficiency and cut carbon pollution to reduce the impacts of climate change, while bolstering energy security and spurring manufacturing innovation.

The final phase two program promotes a new generation of cleaner, more fuel efficient trucks by encouraging the development and deployment of new and advanced cost-effective technologies. These standards cover model years 2018-2027 for certain trailers and model years 2021-2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The standards are expected to lower CO₂ emissions by approximately 1.1 billion metric tons, save vehicle owners fuel costs of about \$170 billion, and reduce oil consumption by up to two billion barrels over the lifetime of the vehicles sold under the program.

J. Summary – Eye on the Future

Freight and goods movement is increasingly important at the federal, state, regional, and local levels. Many freight-related issues, concerns, and solutions apply to the region's overall transportation system, while some are unique to freight and goods movement. As with other components of the MVRTP, DRCOG, CDOT, local governments, and others will continue to work closely with freight stakeholders to plan for the future. The MVRTP recognizes that rapid technological evolution requires the region to be nimble, flexible, and responsive to adapt quickly to changing trends and innovations.

ATTACH 3

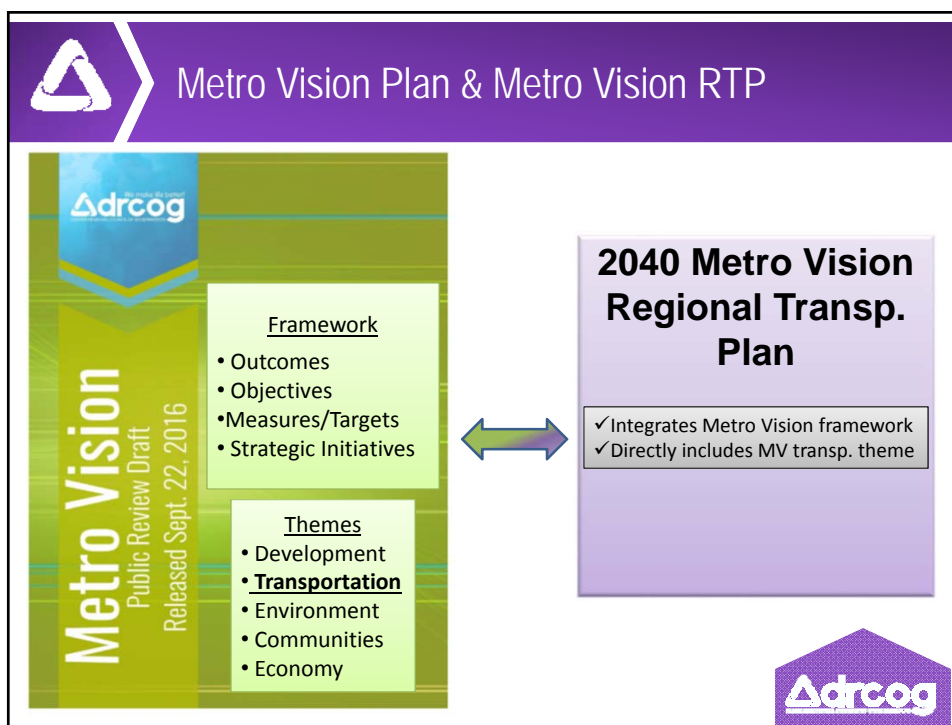


Adrcog

**2040 Metro Vision
Regional Transp. Plan**

Presented by:
Jacob Riger
November 2, 2016

Board Work Session
November 2, 2016



Adrcog

Metro Vision Plan & Metro Vision RTP

Metro Vision
Public Review Draft
Released Sept. 22, 2016

Framework

- Outcomes
- Objectives
- Measures/Targets
- Strategic Initiatives


Themes

- Development
- **Transportation**
- Environment
- Communities
- Economy

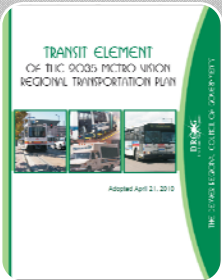
**2040 Metro Vision
Regional Transp.
Plan**

- ✓ Integrates Metro Vision framework
- ✓ Directly includes MV transp. theme

Adrcog

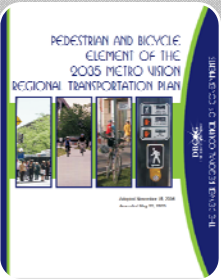


2040 MVRTP – Discussion Topics




TRANSIT ELEMENT
OF THE 2040 MVRTP
REGIONAL TRANSPORTATION PLAN

Adopted April 21, 2010



PEDESTRIAN AND BICYCLE
ELEMENT OF THE
2040 MVRTP
REGIONAL TRANSPORTATION PLAN


Adopted November 18, 2008



Coordinated
Transit Plan

Active
Transportation
(Walk/Bicycle)

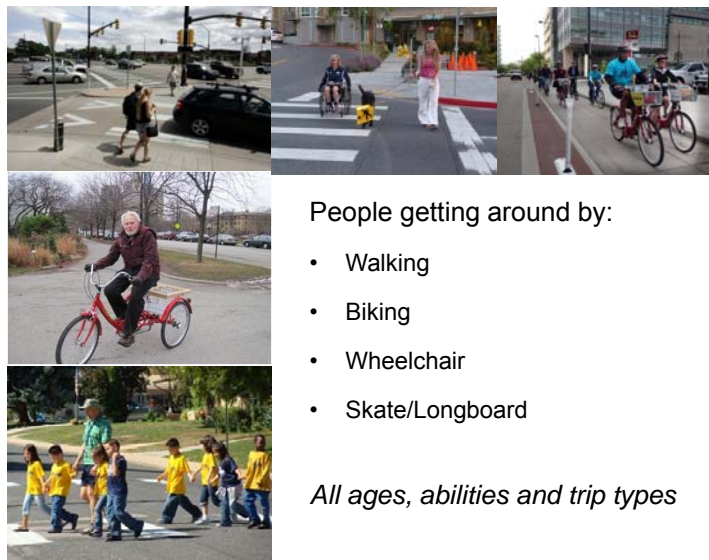
Freight & Goods
Movement



ACTIVE TRANSPORTATION SECTION



What is Active Transportation?



People getting around by:

- Walking
- Biking
- Wheelchair
- Skate/Longboard

All ages, abilities and trip types



4 Main Topic Areas

Existing Conditions

- Miles, Maps, Facility Types, Mode Share, Safety, Benefits

Future Projections

- How many people will be walking and bicycling in 2040?

2040 Vision

- What is the vision for Active Transportation in the region?

Strategies

- How do “we” get there?





How many trips are made by bicycling and walking in the region each day?

- a) 250,000
- b) 500,000
- c) 900,000
- d) 2,000,000



Miles of AT Facilities

Bicycling Facilities

- **2300 miles**

• Source: GIS Data

Pedestrian Facilities

- **18,000 miles**
- Sidewalks \geq 5 feet
- 1300 square miles mapped

• Source: Planimetrics



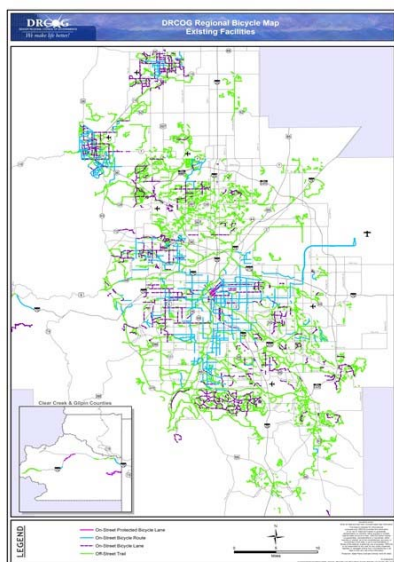


Miles – Bicycle Facilities

Bicycle Facility Type	Miles
Roadways with signed shared lanes	353
Roadways with bicycle lanes	430
Roadways with protected bike lanes	3
Multiuse Trail	1,558
Total:	2,344



Maps – Existing Facilities



DRCOG Regional Bicycle Map

- Web-based interactive map
- 2,344 miles
- Robust, but gaps and barriers





Types of Facilities - Pedestrian

Table 2 and [Pedestrian Infrastructure Gallery](#) (4 categories):

- Sidewalks
- On-street (crosswalks, pedestrian islands..)
- Other (alleys, pedestrian plazas..)
- Pedestrian support infrastructure (wayfinding)



Types of Facilities - Bicycle

Table 3 and [Bicycle Infrastructure Gallery](#) (3 categories):

- On-street bicycle facilities (bike lanes)
- Off-street bicycle facilities (shared-use path)
- Bicycling support infrastr. (bike parking)





Mode Share (to work)

Walking

- 37,000 people (daily)
- 2.4% mode share

Bicycling

- 20,000 people (daily)
- 1.2% mode share



	1980	1990	2000	2010	2014
Walking	4.7%	3.4%	2.4%	2.2%	2.4%
Bicycling	.7%	.7%	.7%	1.1%	1.2%

Source: US Census, ACS Data, 5 year



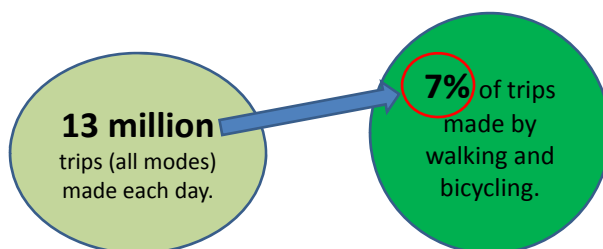
All trips

Walking

- 737,000 trips daily
- 6% of all trips

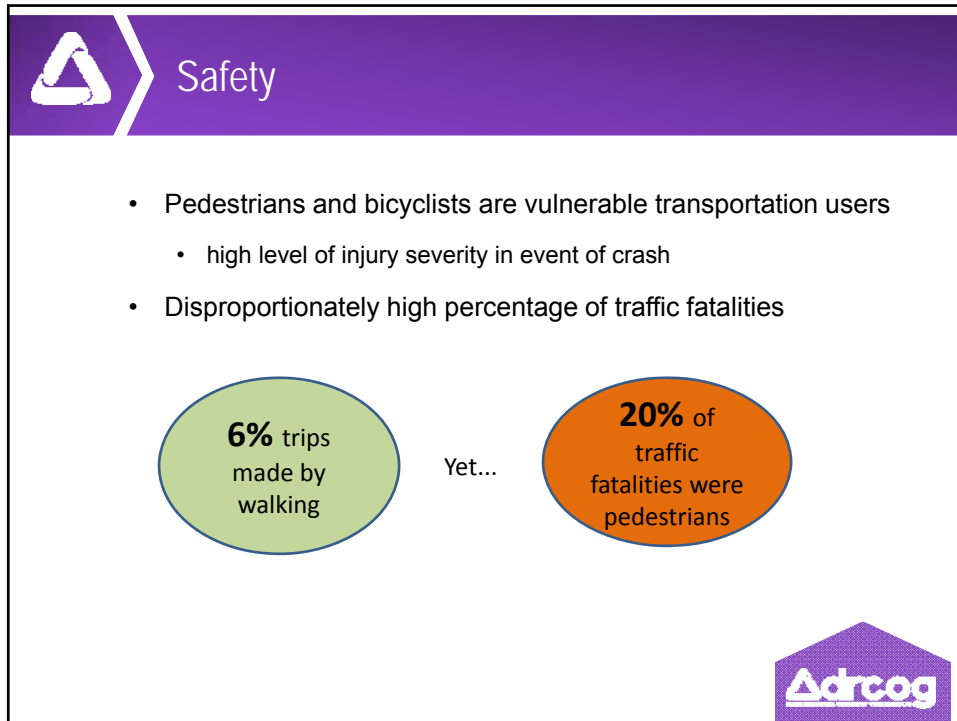
Bicycling

- 123,000 trips daily
- 1% of all trips



Source: DRCOG Travel Model, 2015

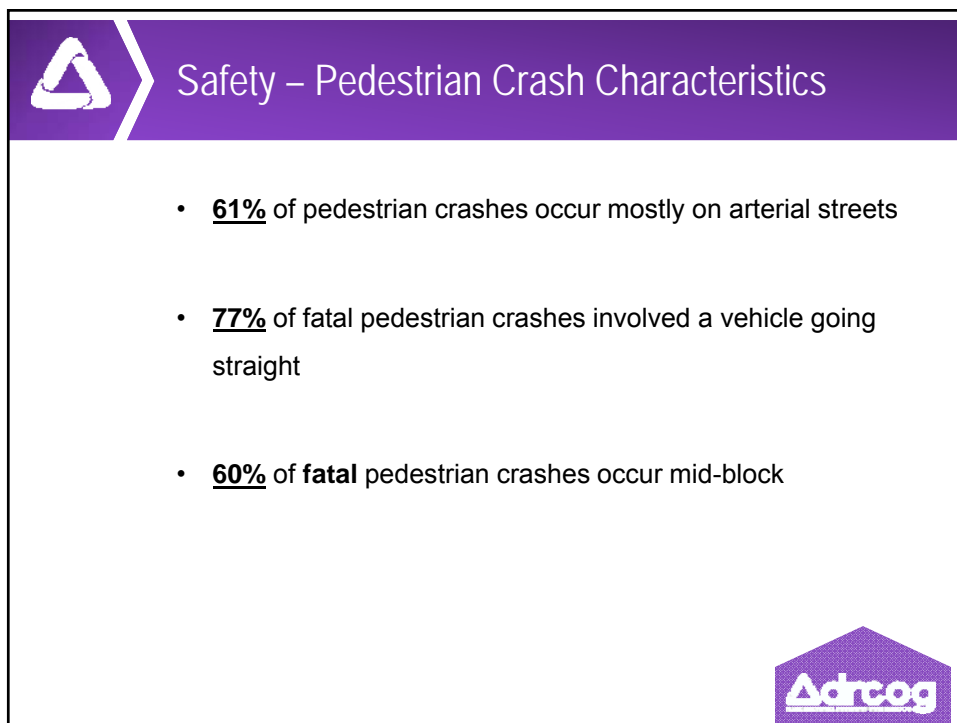





Safety


- Pedestrians and bicyclists are vulnerable transportation users
 - high level of injury severity in event of crash
- Disproportionately high percentage of traffic fatalities

6% trips made by walking Yet... 20% of traffic fatalities were pedestrians



Safety – Pedestrian Crash Characteristics

- 61% of pedestrian crashes occur mostly on arterial streets
- 77% of fatal pedestrian crashes involved a vehicle going straight
- 60% of **fatal** pedestrian crashes occur mid-block





Safety – Bicyclist Crash Characteristics

- 80% of bicycle crashes resulted in injury from 1991-2014
- 100 bicyclists **seriously injured** in reported traffic crashes/year
- 12% of bicycle crashes results in a fatality or serious injury
- 74% of bicycle crashes occur at an intersection



Benefits of AT

- Personal Mobility
- Environmental Benefits
- Health Benefits
- Economic Benefits

Did you know.....

About 70,000 households in the region did not have an automobile?

A robust bicycle and pedestrian network can provide cost-effective mobility options for people of all ages, abilities and incomes.





Benefits of AT

- Personal Mobility
- **Environmental Benefits**
- Health Benefits
- Economic Benefits

Did you know...

Over 1 million drive alone trips are made daily equal or less than the average bike/walk trip distances?

Opting to walk or bike in lieu of driving alone reduces congestion, air pollution, GHGs, and VMT



Benefits of AT

- Personal Mobility
- Environmental Benefits
- **Health Benefits**
- Economic Benefits

Did you know...

1 of 2 U.S. adults is living with a chronic disease and two-thirds are overweight or obese?

27% of children 2-14 in CO are obese or overweight?

Walking and bicycling can help reduce or mitigate obesity, stress and chronic disease





Benefits of AT

- Personal Mobility
- Environmental Benefits
- Health Benefits
- Economic Benefits

Economic Development

"The number one thing they want is bike lanes. Ten years ago we never would have thought that walkability or bike lanes would be economic development tools."

— Tami Door, Downtown Denver Partnership,
on what tech companies say they want in order to
locate to or stay in Denver

- Cost-effective modes
- Can be constructed at relatively low-cost
- Demonstration, pilot, and interim design projects
- AT is an economic development tool



Future Trends for AT

Number Daily Per Trips	2015	2040	% Increase
All trips	12,977,100	17,977,100	35%
Walking	736,942	1,148,311	56%
Bicycling	122,759	178,501	45%

• Active transportation trips are projected to increase from 7% to **8%** of all trips by 2040.

• Bicycling trips are projected to account for only **1%** of all trips by 2040.





Looking to 2040...

1. Increase walking and bicycling mode share beyond what is projected
2. Provide a robust walking and bicycling network for people of all ages and abilities
3. Improve the safety of the pedestrian and bicycle network thereby reducing (and strive to eliminate) serious injury crashes and fatalities



Low Stress (High Comfort) Network

- Attracts a wide segment of the population
- On/adjacent to lower speed/volume roads
 - e.g., wide sidewalks buffered by landscaping, protected bike lanes, multiuse facilities....





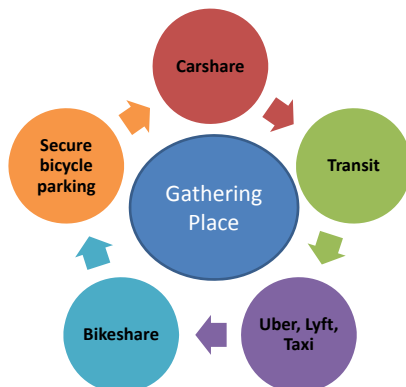
Connecting the AT Network

- Connecting a low-stress network
- Network continuity and consistency
- Fill in gaps, remove barriers within existing network and to first/final mile connections



Multimodal Transportation Nodes

- Cluster mobility options and amenities at popular destinations, transit stations, and urban/town/suburban centers





Complete Streets

Safely accommodate motorized and active transportation users of all ages and abilities along the street network.



Supporting Infrastructure and Technology

- Bicycle and Pedestrian support infrastructure
 - Pedestrian shelters at transit stops
 - Shade trees, landscaping along sidewalks/trails
 - Bicycle Parking
 - Wayfinding
- Real-time, multimodal trip planning





DRCOG's Role in Implementing Active Transportation

- Fund bike/ped projects in TIP
- In current TIP (2016-2021):
 - 22% of funds allocated directly to b/p projects
 - 100% of b/p projects selected are protected or grade-separated from the roadway
 - \$\$ to b/p projects as part of larger roadway projects
- Development of a Regional Active Transportation Plan in 2016
 - Will become part of MVRTP



FREIGHT SECTION



Freight & Goods Movement Overview

Purpose: Data, education, coordination, awareness

Context

- Federal & state emphasis (FAST Act)
- Coordinate with CDOT (Freight Advisory Council, Freight Plans)
- UPWP task – Regional Freight Movement Study



Freight Section Topics

Introduction

- What is freight & goods movement?

FAST Act Guidance

- National goals
- Freight networks
- Planning factors

Stakeholder Input

- Outreach activities, events
- Key concerns/input

Network & Facilities

- Network definitions
- Profiles by mode
- Multimodal terminals
- Safety
- RR crossings
- Warehousing
- Hazmat

Commodity Flows

- Imports/exports
- In-state, out-of-state
- By weight & value
- Truck, rail
- 2010, 2040

Other Topics


- MVRTP projects/strategies
- Operations & technology
- Air quality





▼ **Shipment Progress**

Location	Date	Local Time	Activity
DENVER, CO, US	10/29/2015	3:39 P.M.	Delivered
Commerce City, CO, United States	10/29/2015	5:22 A.M.	Out For Delivery
	10/29/2015	12:45 A.M.	Arrival Scan
Hodgkins, IL, United States	10/27/2015	5:18 P.M.	Departure Scan
Hodgkins, IL, United States	10/26/2015	10:32 P.M.	Arrival Scan
Shepherdsville, KY, United States	10/26/2015	6:00 P.M.	Departure Scan
	10/26/2015	5:23 P.M.	Origin Scan
United States	10/26/2015	7:41 P.M.	Order Processed: Ready for UPS





Federal Requirements & Guidance

FAST Act Provisions

- National Multimodal Freight Policy (NMFP) – goals to guide decision-making
- National Freight Strategic Plan (NFSP) – implement goals of NMFP
- National Multimodal Freight Network (NMFN)
 - Includes funding program
- National Highway Freight Network (NHFN)
 - Includes funding program
- Requires state-level freight plans; encourages state freight advisory committees



CDOT Coordination

- CDOT Freight Plans
 - DRCOG participation for economies of scale: data, information, outcomes, recommendations
 - Incorporate into MVRTP, address UPWP freight task
- Freight Advisory Council (DRCOG participates)
 - Advise on issues, projects, priorities
 - Educate about freight importance
 - Forum for opportunities and strategies
 - Seek partnerships and funding
 - Share information & data
 - Identify short and long term mobility initiatives
 - Advise CDOT, others on transportation planning efforts





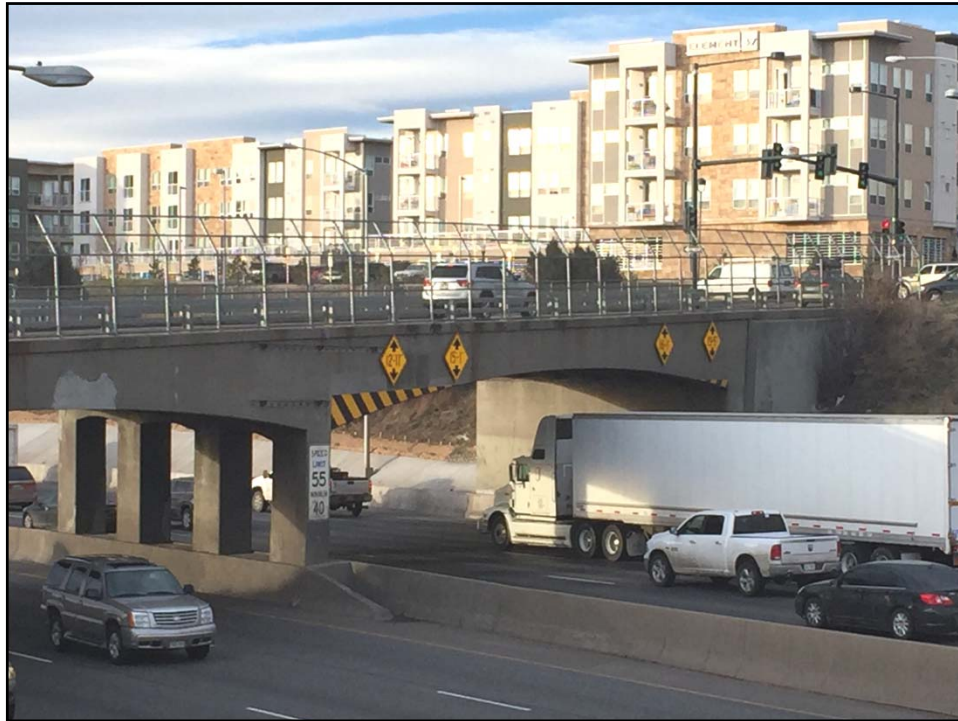
CDOT Freight Plans



Key Plan Elements

State Freight & Passenger Rail Plan	Combined Tasks (Overlapping)	Multimodal Freight Plan
The Role of Rail in Statewide Transportation	Existing Conditions	Project Selection Criteria Framework
Objectives for Freight Rail & Passenger Rail Services	Future Conditions - Emerging Trends & Forecasts	Freight Vision, Goals & Strategies Development
Proposed Passenger and Freight Rail Improvements & Investments	Economic Analysis of Freight & Rail System	Development of Freight Performance Metric(s) & Monitoring
The State's Rail Service & Investment Program	Network Issues, Needs Assessment & Opportunities	Implementation Framework
State Rail Coordination & Review	Stakeholder Participation	
	Public Involvement	

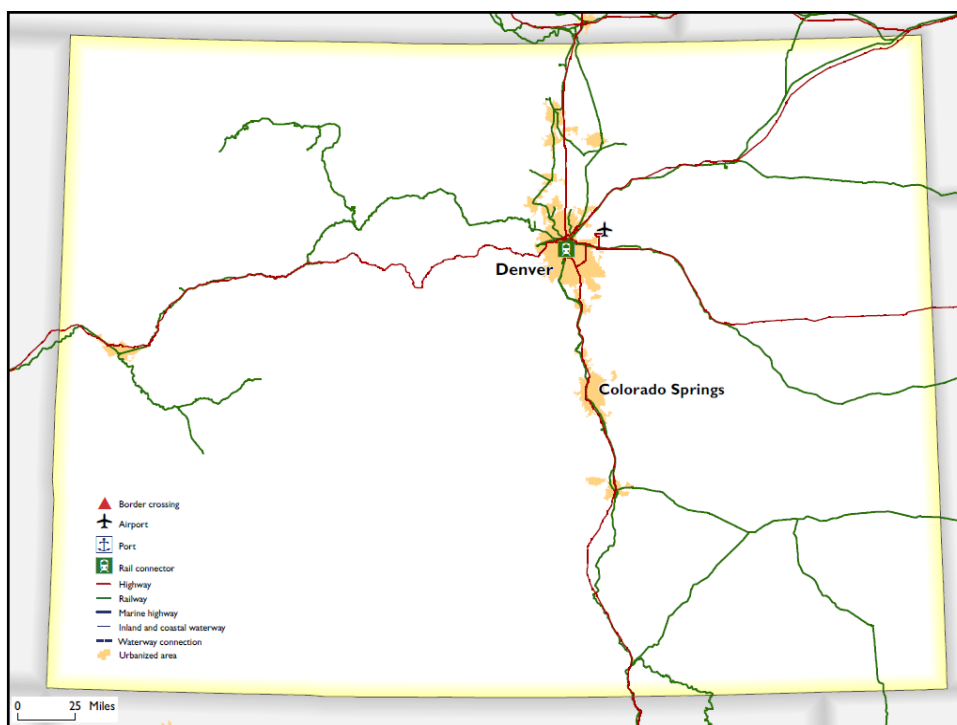
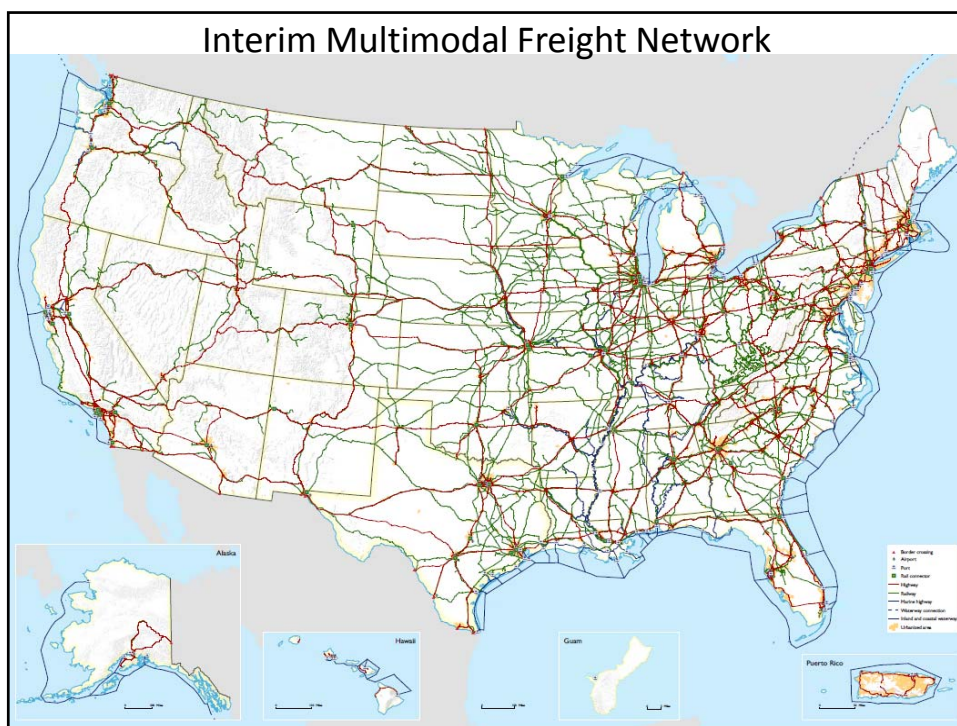


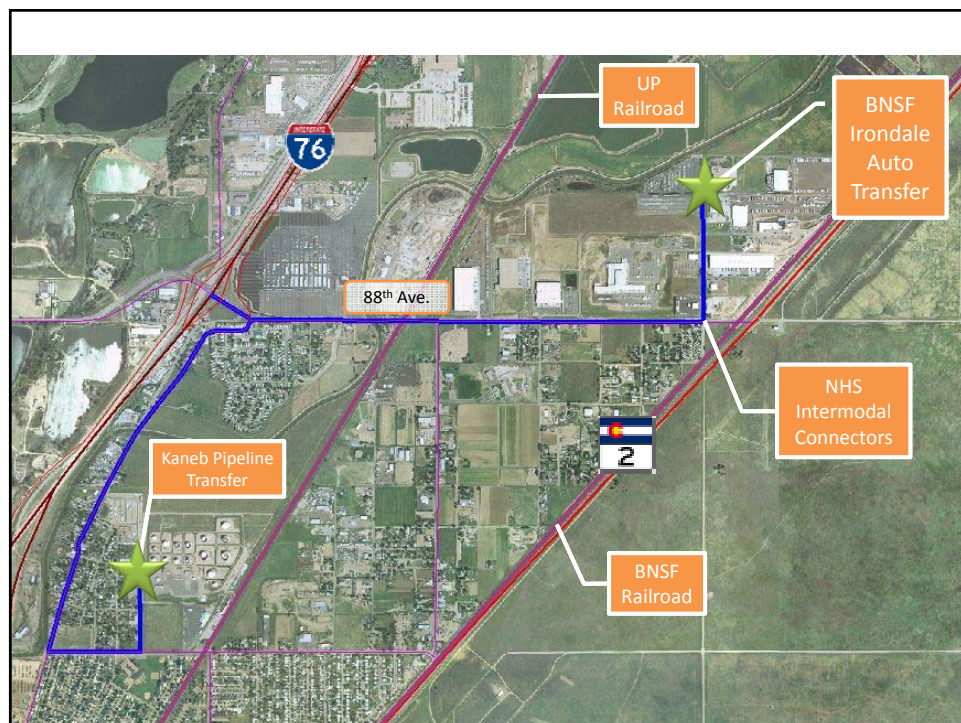
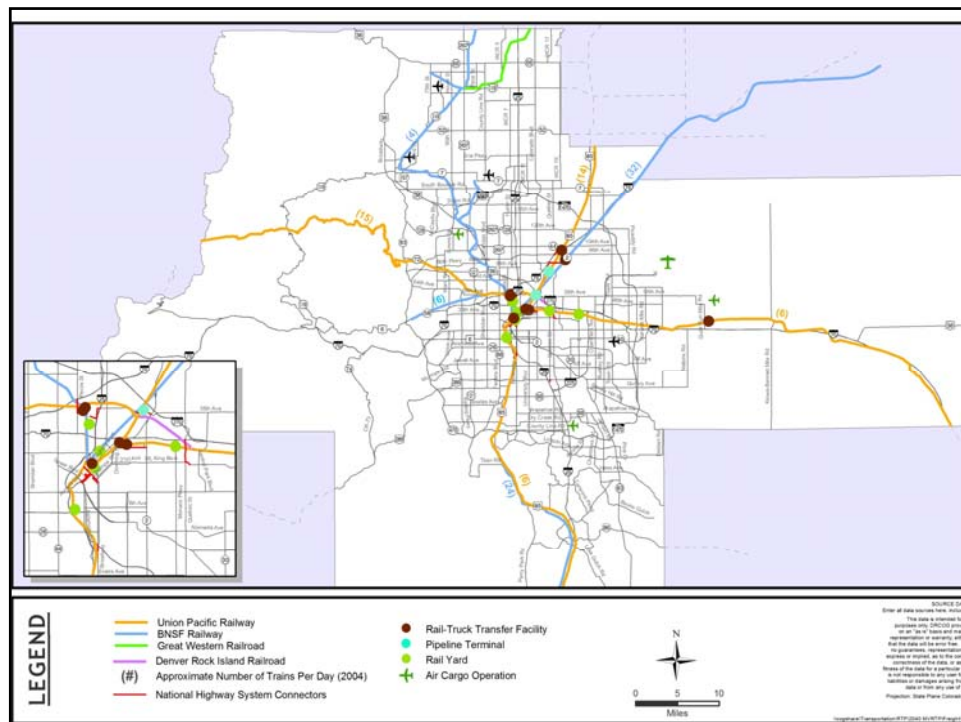


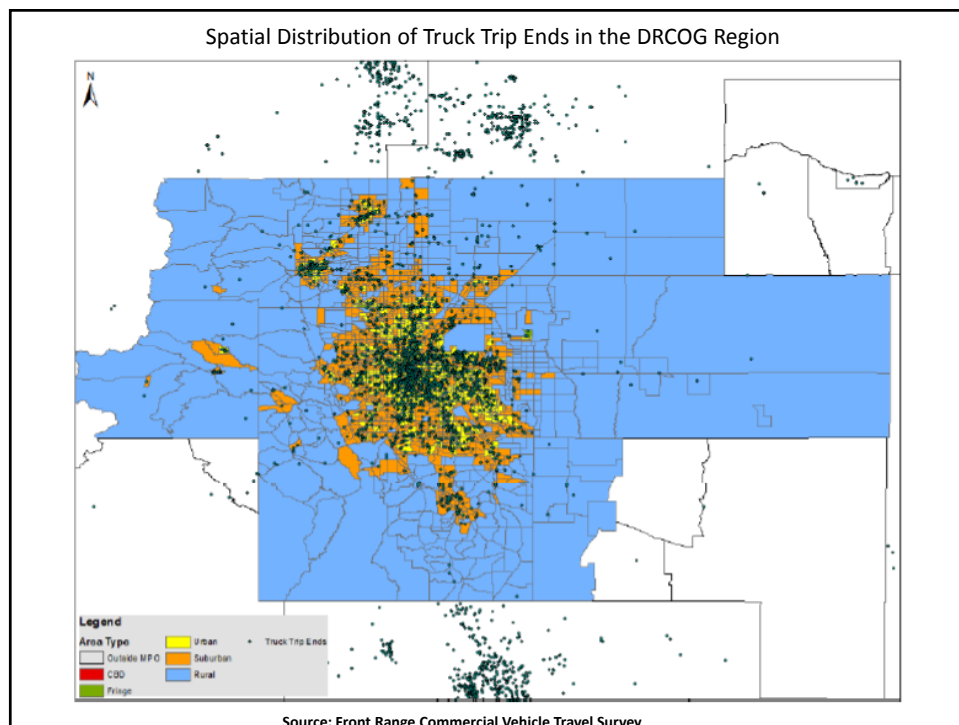
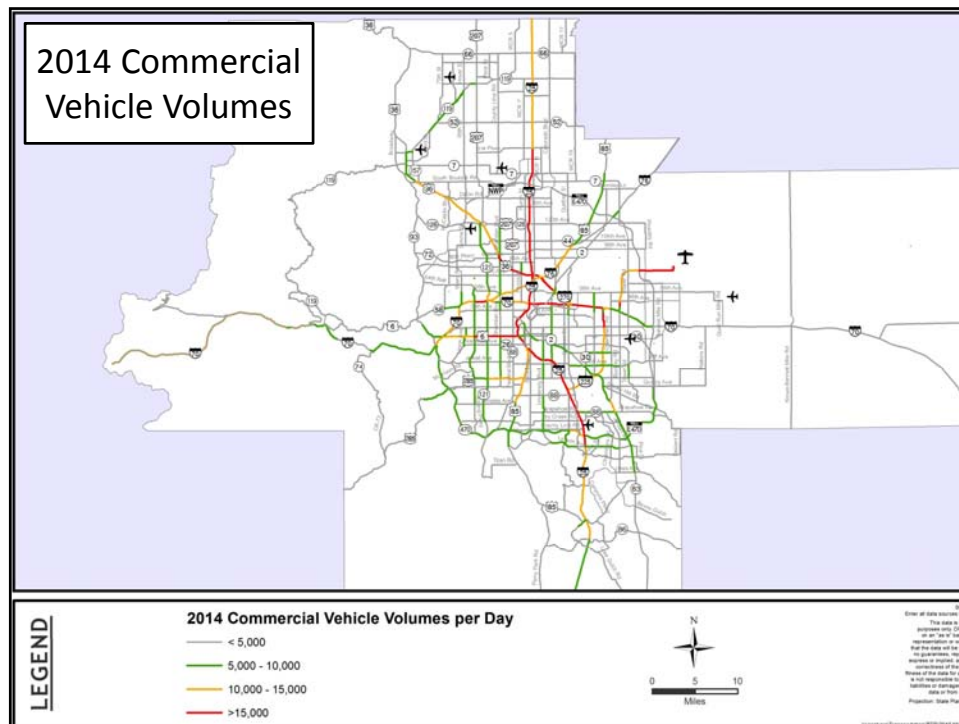
Stakeholder Input

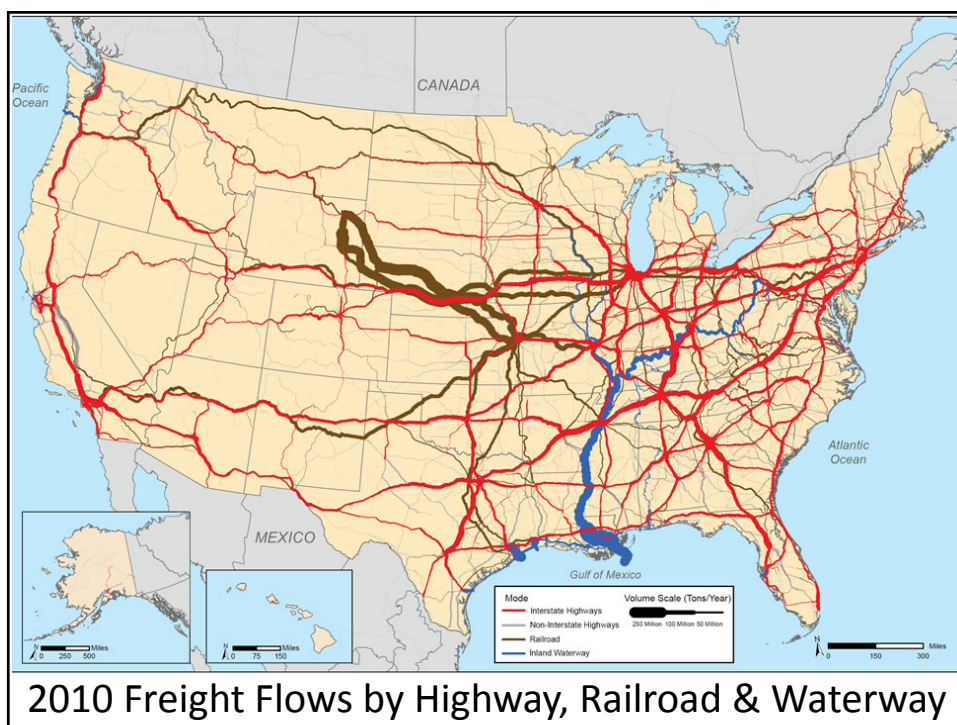
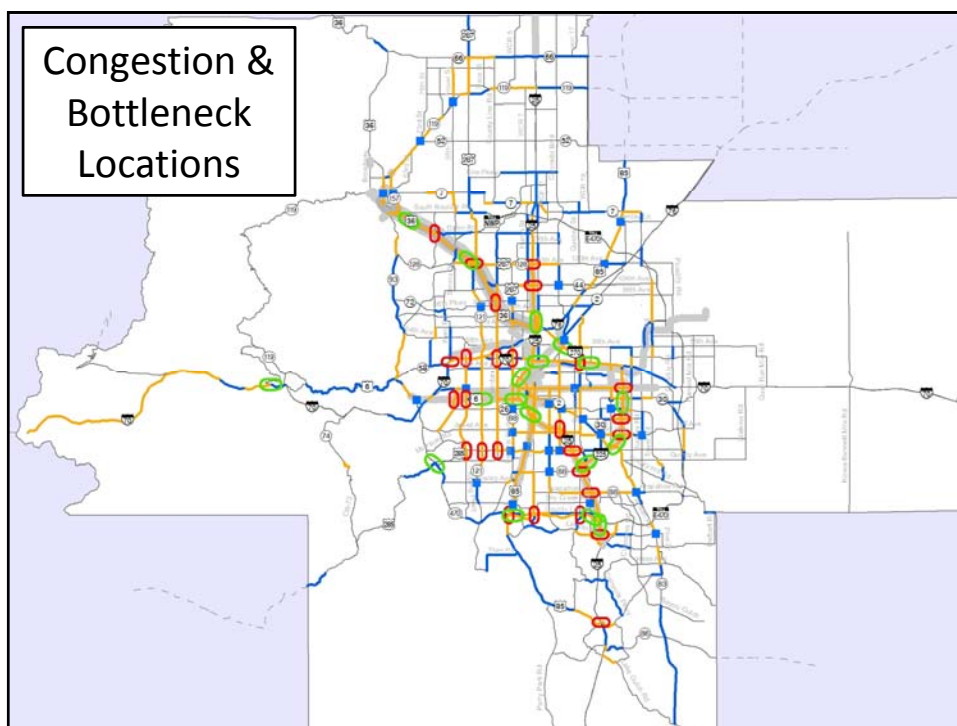
- Roadway congestion: reliability, cost, logistics
- Safety at rail/highway crossings, quiet zones
- Roadway design, turning radii
- Deficient bridges, poor roadway conditions
- Truck pull-offs & parking
- Delivery time restrictions
- *And many others...*











Commodity	2010 Existing		2040 Forecast	
	Tons	Percent	Tons	Percent
Warehouse & Distribution Center	2,580,580	12%	4,469,500	12%
Gravel or Sand	2,197,050	10%	3,674,070	10%
Ready-mix Concrete, Wet	2,175,630	10%	4,511,520	12%
Concrete Products	1,784,190	8%	3,539,820	10%
Malt Liquors	1,653,190	8%	1,982,880	5%
Asphalt Paving Blocks or Mix	1,035,290	5%	937,950	3%
Other Commodities	10,145,190	47%	17,745,650	48%
Total Tonnage	21,571,120	100%	36,861,390	100%

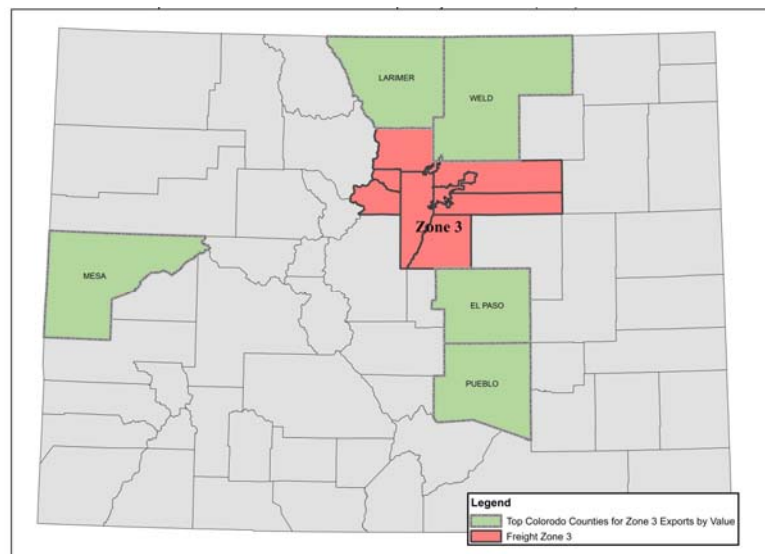
Export Commodity Flows

98% of exports
by truck

Commodity	2010 Existing		2040 Forecast	
	Value	Percent	Value	Percent
Warehouse & Distribution Center	\$2,738,910,550	10%	4,743,728,330	6%
Missile or Space Vehicle Parts	\$1,652,912,180	6%	3,668,958,830	5%
Electronic Data Processing Equip.	\$1,565,718,120	5%	7,613,461,930	10%
Malt Liquors	\$1,517,309,710	5%	1,819,391,540	2%
Orthopaedic or Prosthetic Supplies	\$1,004,238,680	3%	4,525,069,570	6%
Rail Intermodal Drayage from Ramp	\$941,645,050	3%	2,473,170,180	3%
Misc. Plastic Products	\$845,860,200	3%	2,028,632,810	3%
Drugs	\$687,976,570	2%	2,477,405,670	3%
Solid State Semiconductors	\$169,017,800	1%	5,741,746,760	8%
Other Commodities	\$17,700,284,860	61%	38,781,659,150	52%
Total Value	\$28,823,873,720	100%	73,873,224,770	100%

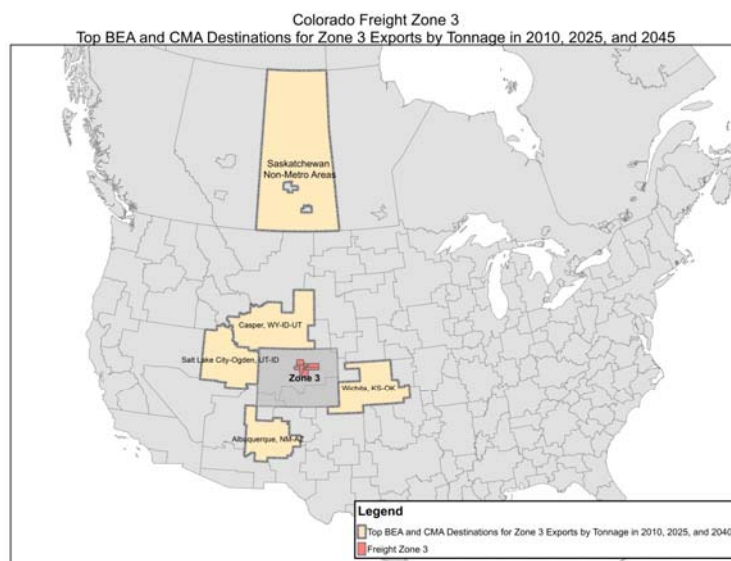


Top Colorado Destinations of Denver Region Exports by Value in 2010 and 2040






Top Out of State Destinations of Denver Region Exports by Tons in 2010 and 2040





MVRTP Freight-Related Investments

- Expand the regional roadway system, remove bottlenecks, and construct new roads and interchanges
- Construct railroad crossing grade-separations at critical locations
- Provide roadway management and Intelligent Transportation System applications such as traveler information systems, incident management, and variable message signs






Evolving Technology



- RoadX – CDOT initiative to use innovative technology to improve transportation system safety, mobility, and efficiency
- Many concepts: truck platooning, virtual guardrails, autonomous vehicles, etc.
- The definition of freight and freight transport continues to change – how will mobility, congestion, VMT, and other trends be affected?



ATTACH C

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Director, Transportation Planning & Operations
303-480-6747 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
November 2, 2016	Information	6

SUBJECT

Review the role of annexation in urban growth boundary/area (UGB/A) policy.

PROPOSED ACTION/RECOMMENDATIONS

N/A

ACTION BY OTHERS

N/A

SUMMARY

Background

At the October work session, Directors discussed the mapping methodology to identify the current extent of urban development. The Directors gave guidance that staff should pursue needed technical improvements while other potential improvements to UGB/A processes and policies are discussed at upcoming work sessions. The Board's review of existing UGB/A policy and procedures begins with this agenda item.

Annexation and the Denver Region's UGB/A

The region's UGB/A program is designed to help manage the overall extent of urban development, or "footprint." To keep the program flexible, individual jurisdictions have their own allocation, much like a department would have a budget within an overall organizational budget. Existing UGB/A policy aims to ensure that each jurisdiction retains control over how and when to use their UGB/A allocation.

The program emphasizes local control, therefore, regional UGB/A policy must address what happens when jurisdiction boundaries change – most commonly through annexation. These aspects of the current policy can be found in the [Metro Vision Growth and Development Supplement](#). The relevant language from the *Supplement* is excerpted and included in Attachment 1.

Staff will use the attached presentation (Attachment 2) to walk the Directors through current UGB/A policies that govern how annexation areas are treated in regard to post-annexation UGB/A allocation (city and county).

Context, previous feedback and staff observations

Most annexations do not include land covered by UGB/A at the time of annexation. Additionally, some cities and towns show future UGB/A beyond their existing boundaries – meaning they annex land already covered by their own UGB/A. Annexations can also involve unincorporated areas that are currently classified as urban – see Attachment 1 and Attachment 2 (slide 16) for current policy applied in those cases.

In recent years, staff has received Director feedback on this policy, generalized as follows:

- Don't let UGB/A get in the way of annexation powers under state statute.

- There's nothing to compel cities and towns to work with counties on what to do with areas covered by UGB/A during an annexation.
- It's not fair that counties can lose UGB/A through annexation.

DRCOG staff have also observed specific items that could be addressed in policy revisions:

- It is difficult for DRCOG staff to work out the details of what should happen with local UGB/A totals after the fact. On paper, local governments are expected to notify DRCOG through the UGB/A self-certification process. In practice, subsequent regional analysis by DRCOG reveals annexations involving UGB/A, requiring follow-up from DRCOG staff.
- The existing policy uses confusing language concerning “developed land” instead of “land classified as urban.” Currently urban land may not appear developed, but carry that designation because of context or pre-building activities (i.e. subdivision).
- The existing policy requires counties to notify a city if they move UGB/A from land within 3 miles of that city's boundary. The intent behind this notification requirement is unclear.

Staff have provided the following ***discussion questions*** to facilitate a conversation about desired intent of this policy.

- **Should the region's UGB/A be able to grow as the result of annexation without Board action?**
- The existing Urban Growth Area (UGA) option can protect counties against “losing” future urban growth area – **Should this be required for all counties?**
- The *Supplement* states that the “appropriate focus for DRCOG is regional, not local.”
 - Does **individual jurisdiction UGB/A allocation** or “ownership” matter to the region? Or is the **assignment/commitment on the ground** more important, regardless of jurisdiction “ownership”?
 - Should DRCOG **directly engage local parties** earlier in the process to sort out how annexation plays out in the UGB/A context? Or should DRCOG focus on **equipping local parties** with best practices and other tools that can help ensure better local-to-local communication?

Staff is seeking high-level guidance from the Directors about the direction and type of changes, if any, staff should pursue when drafting potential revisions to UGB/A annexation policies (as outlined in Attachment 1). A redlined draft will be brought back for Director consideration in early 2017.

PREVIOUS DISCUSSIONS/ACTIONS

[October 5, 2016](#) – Work session discussion of how to best use future work sessions to consider urban growth boundary/area (UGB/A) policy and process improvements

August 6, 2016 – Board workshop discussion of the anticipated UGB/A discussion expected next year ([slides available online](#))

PROPOSED MOTION

N/A

ATTACHMENT

Attachment 1 – “UGB/A and annexations” from *Metro Vision Growth and Development Supplement*

Attachment 2 – Presentation Slides

Link – [Metro Vision Growth and Development Supplement](#) (full document)

ADDITIONAL INFORMATION

If you need additional information, please contact Douglas W. Rex, Director, Transportation Planning & Operations, at 303-480-6747 or drex@drcog.org; Brad Calvert, Regional Planning and Development Director at 303-480-6839 or bcalvert@drcog.org, or Andy Taylor, Senior Planner at 303-480-5636 or ataylor@drcog.org.

ATTACH 1

Attachment 1

Metro Vision Growth and Development Supplement Excerpt

Adopted January 18, 2012

UGB/A and annexations

DRCOG allocates UGB/A to each member jurisdiction. Therefore the situation may arise whereby a city annexes an area located within a county's UGB/A. Ideally, cities and counties facing this situation will have entered into an intergovernmental agreement (IGA) that includes a provision for resolving UGB/A issues. DRCOG assumes that any self-certified UGB/A changes are consistent with such IGAs.



The following policies apply when an IGA is not in place:

- a. When a city annexes developed land located within the county's UGB/A, DRCOG will subtract the area from county's UGB/A allocation and add it to the city's UGB/A allocation.
- b. When a city annexes undeveloped land located within the county's UGB/A, the city and county must determine whether the annexed area
 - a. is subtracted from the county's allocation and added to the city's allocation; or
 - b. is covered with UGB/A "flexed" from elsewhere within the city's allocation (see the flexibility provisions above), which allows the county to move the annexed amount to another location; or
 - c. will remain non-urban and does not require UGB/A, which also allows the county to move the annexed amount to another location. In this situation, the city may subsequently apply for new UGB/A to cover the annexed area.

The city and the county will notify DRCOG of their joint intention regarding the annexed UGB/A as part of the self-certification letter.

When a county intends to remove UGB/A from an area within three miles of the incorporated limits of a city, the county will notify the affected city prior to any self-certification.


ATTACH 2



Urban Growth Boundary/Area (UGB/A)


UGB/A Maintenance: Annexation

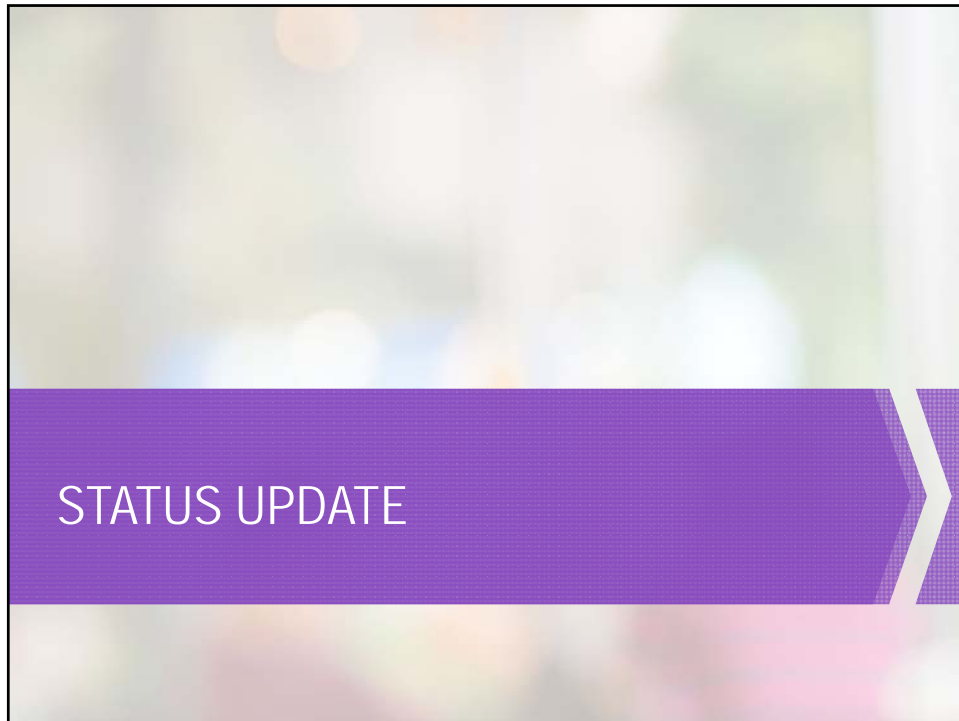
Presented by:
Brad Calvert
November 2, 2016




Outline – Today's Discussion


- Status update
- UGB/A and annexation (current process)
 - Key background (slides 7-13)
 - Visual depiction of current policies (14-30)
- Previous feedback and staff observations
- Discussion questions







Status: evaluating / fixing the current process



Development classification system


- October work session briefing
- Local staff engagement

Allocation request process

- Work session discussion to start in January 2017


UGB/A maintenance

- ***Today's topic: annexation***




Schedule		
Who	What	When
Board work session	UGB/A maintenance: annexation	Begin today 11/2/2016
	Allocation request process improvements	Tentatively to begin 1/4/2017
	UGB/A maintenance: other improvements	To be determined
	Development class. system improvements	Targeting March or April 2017
	Growth and Development Supplement Amend.	Targeting May or June 2017
Local technical input – Development Class. System	Intro/overview webcast	10/28/2016*
	Meeting #1 at DRCOG	11/15/2016
	Meeting #2 at DRCOG	1/10/2017
	(If needed) Meeting #3 at DRCOG	2/7/2017
	Local review period - DevType results	Begin as early as May 2017
Board action	Growth and Development Supplement Amend.	Targeting May or June 2017
	Invite regular cycle UGB/A allocation requests	Begin as early as July 2017

* Available as a recording




UGB/A AND ANNEXATION (CURRENT)



Key themes for UGB/A policy


Metro Vision Growth and Development Supplement


Adopted January 28, 2012



- a. Overall goal: Seeks to enhance quality of life
- b. Assumes good intent from local communities
- c. Flexible structure acknowledges varying local context
- d. Focuses on regional “30,000 foot level”
- e. Balances rigor and simplicity
- f. UGB/A serves various roles

Metro Vision 2035 Growth and Development Supplement, Extent of Urban Development – Overview (Pages 3-4)





Q: What does UGB/A cover?

A: Both currently urban land and future urban growth are part of one's UGB/A allocation


Currently
urban
land

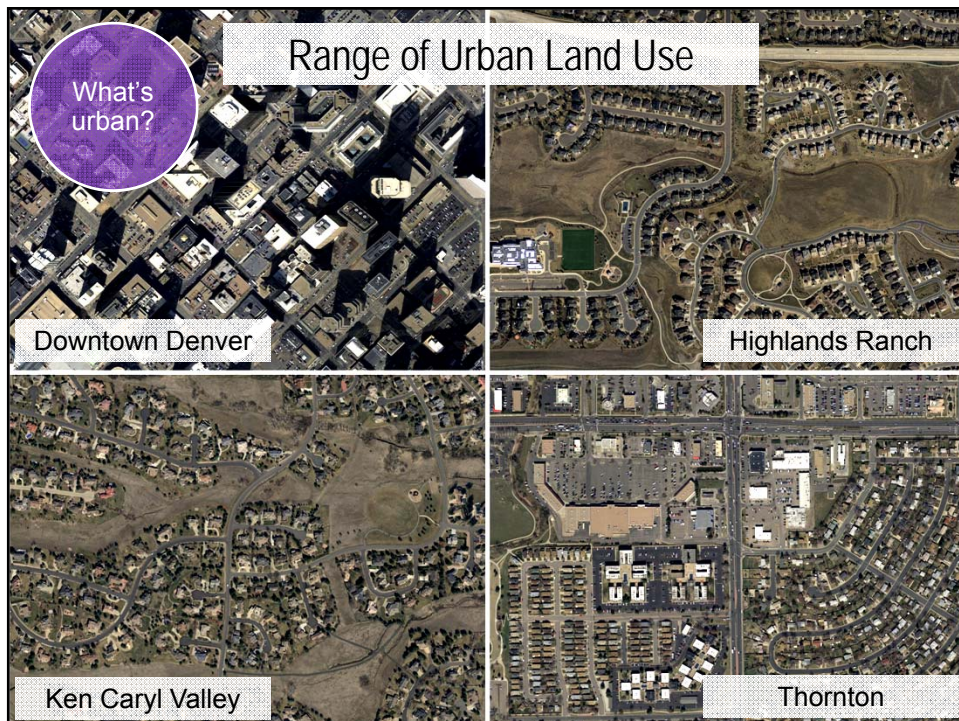
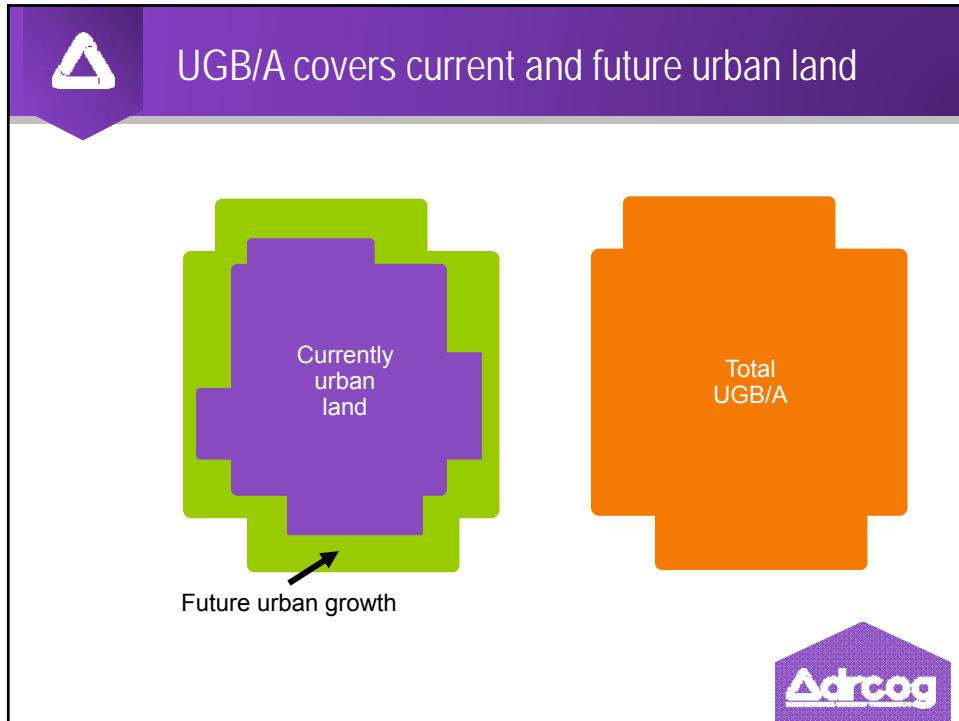
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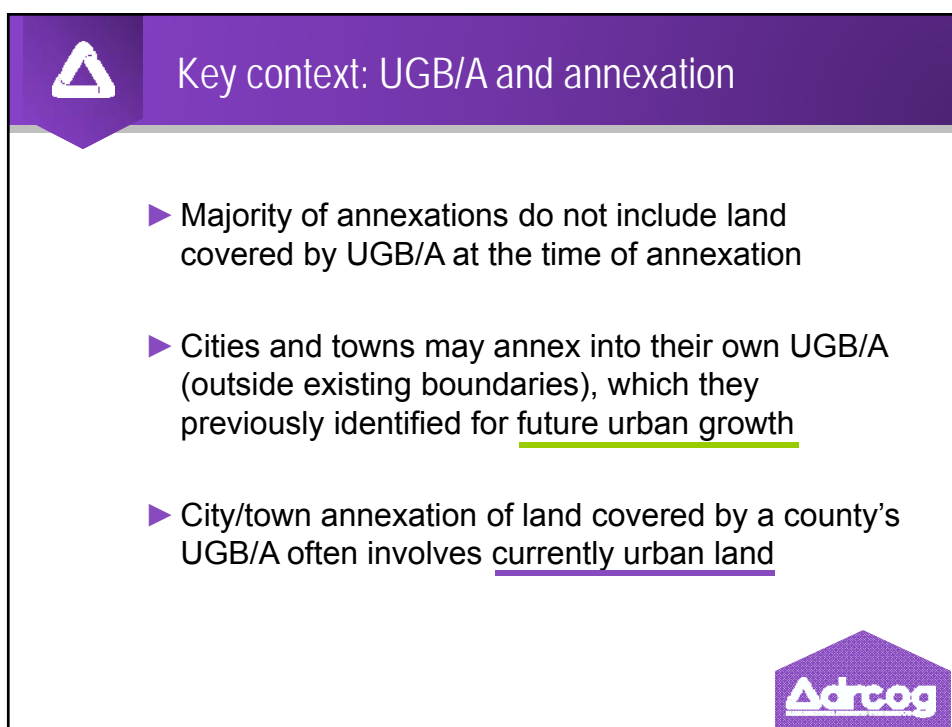
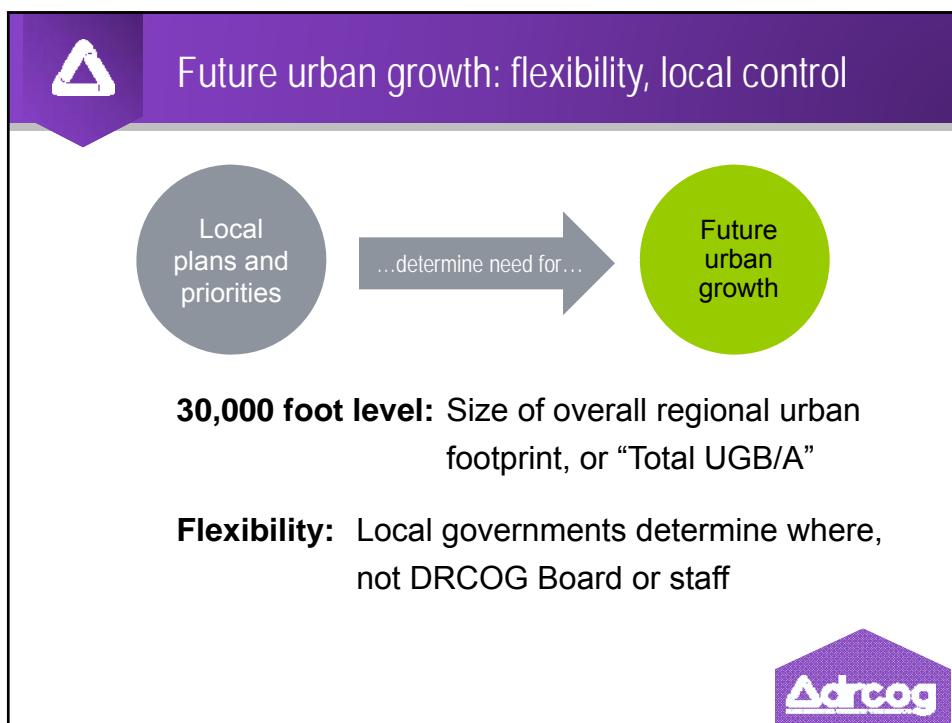
Future
urban
growth

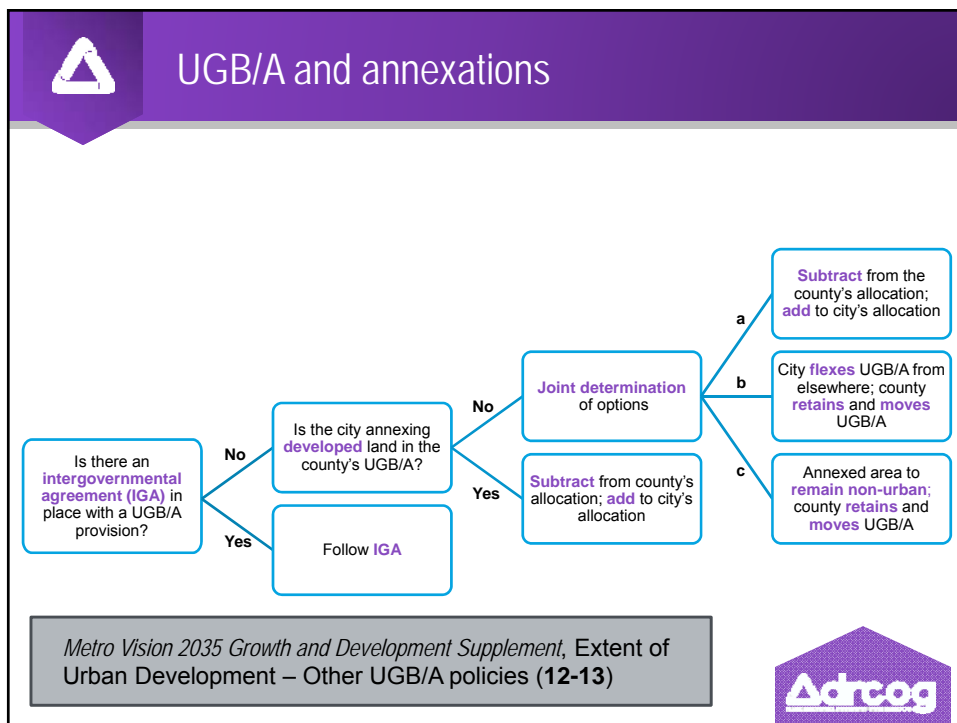
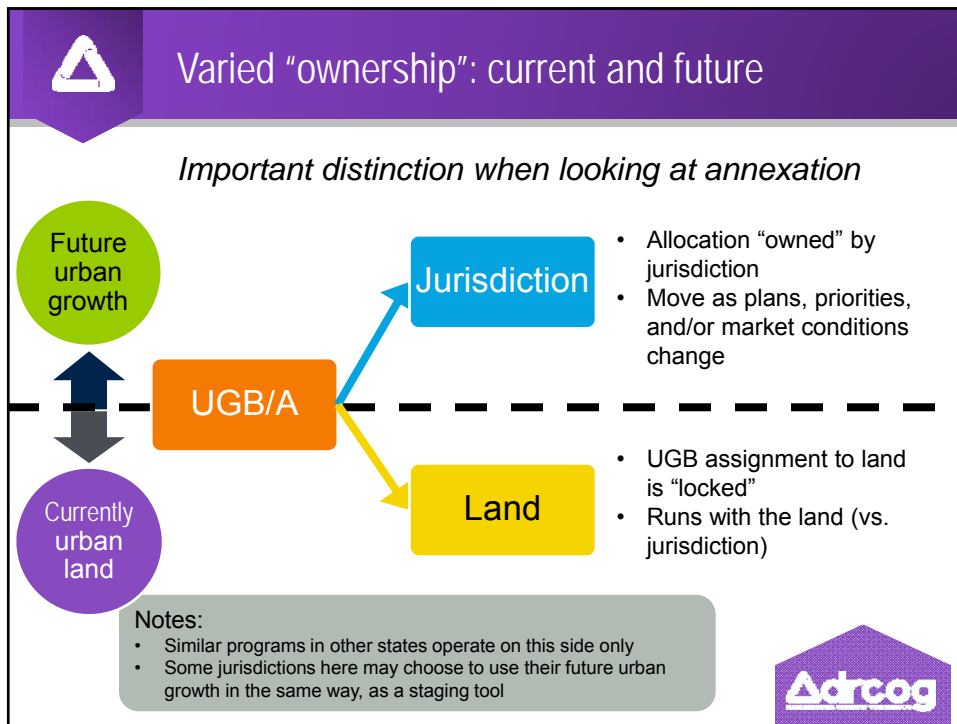
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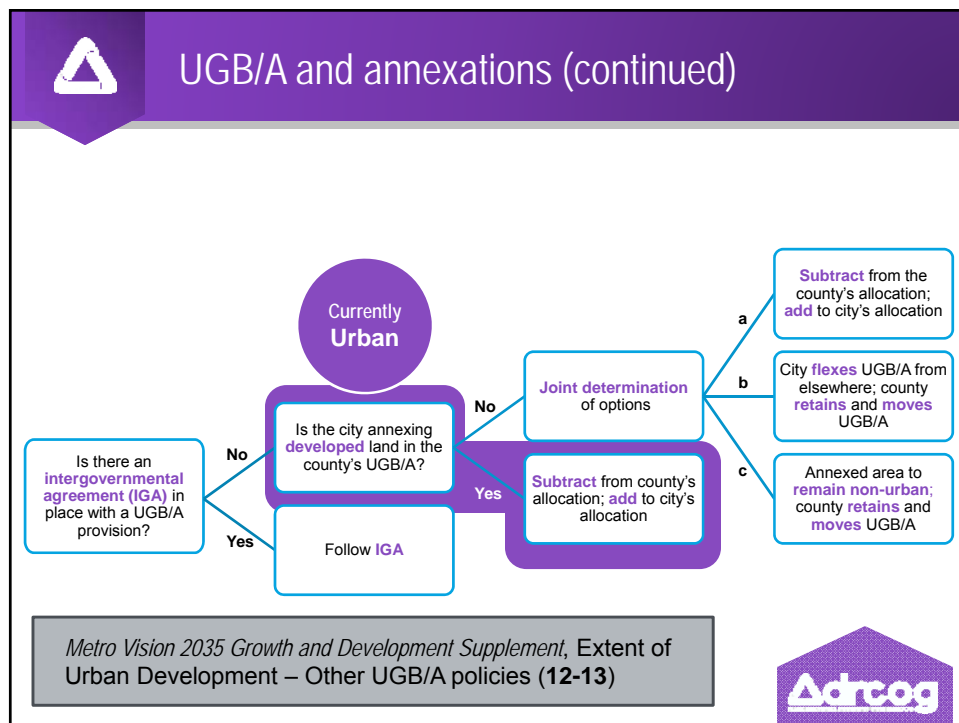
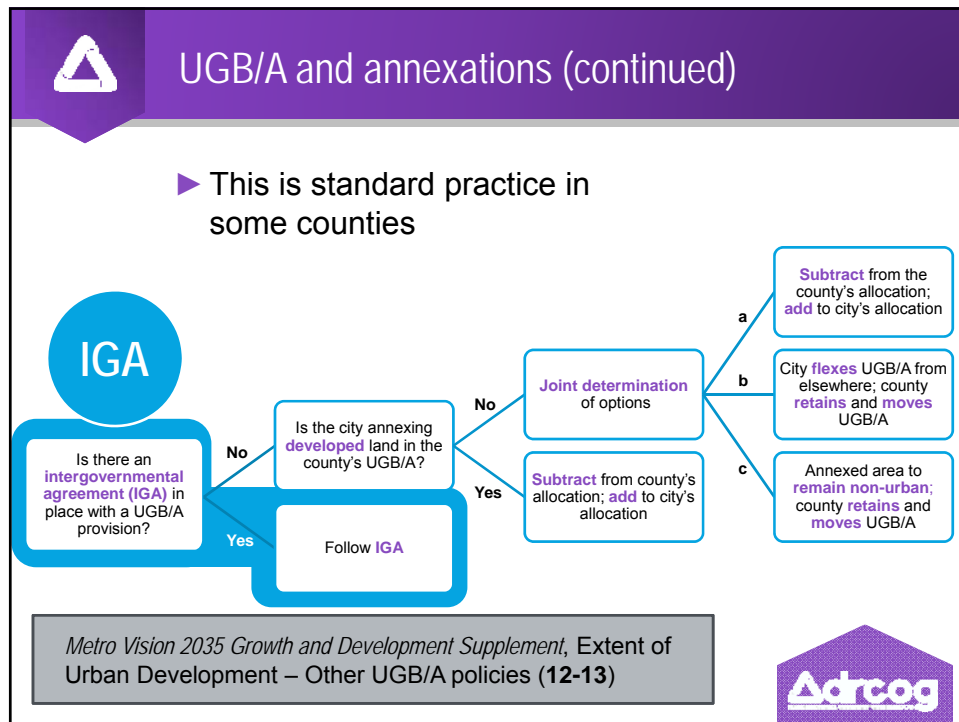
Total
UGB/A

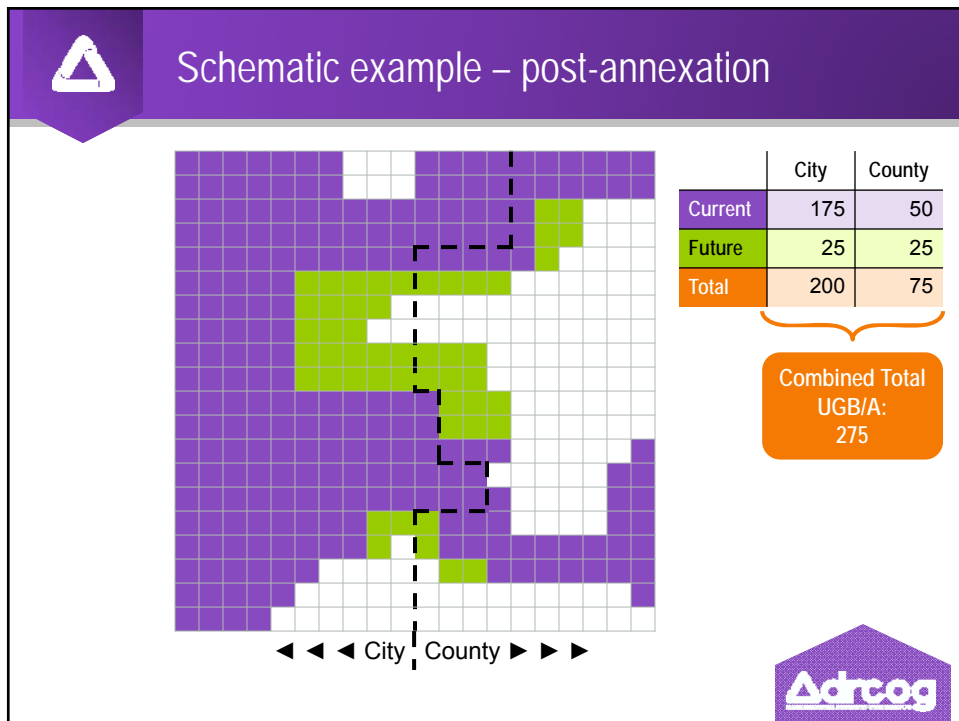
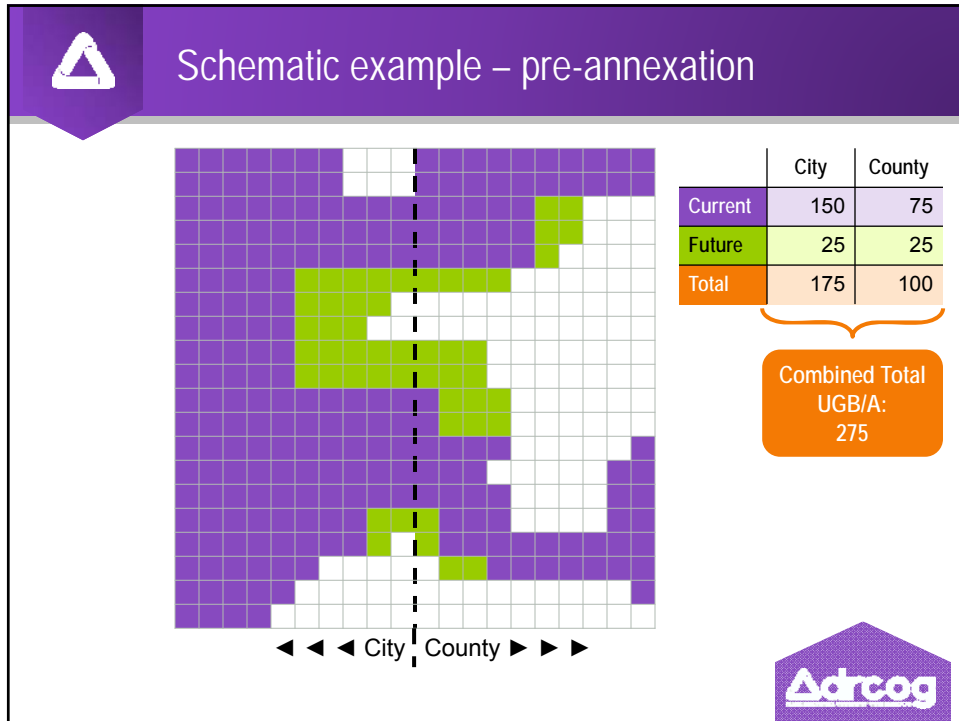


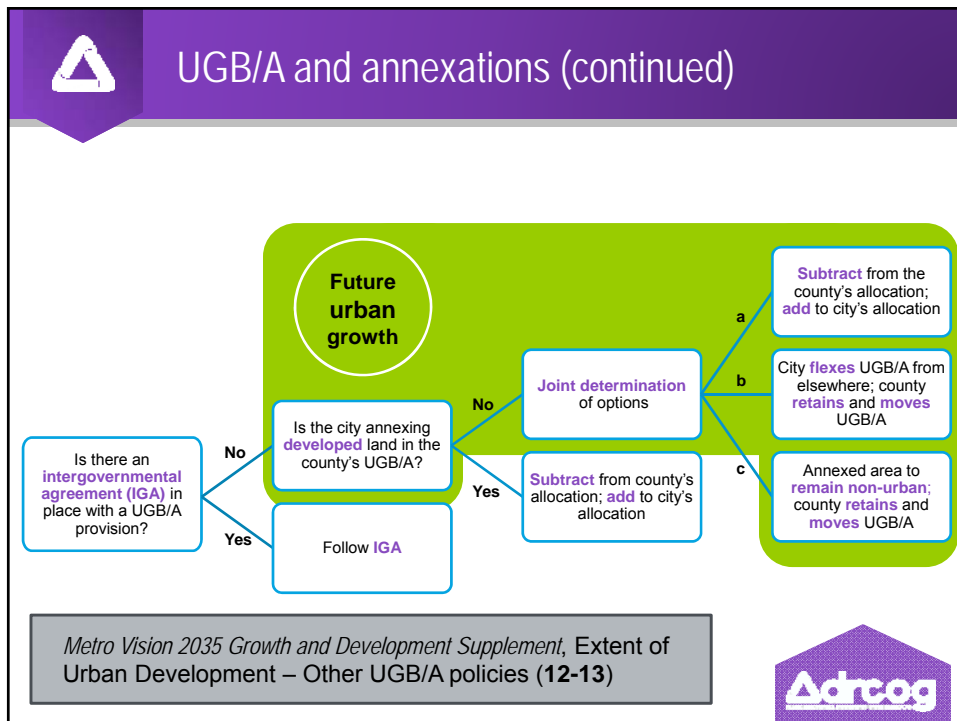
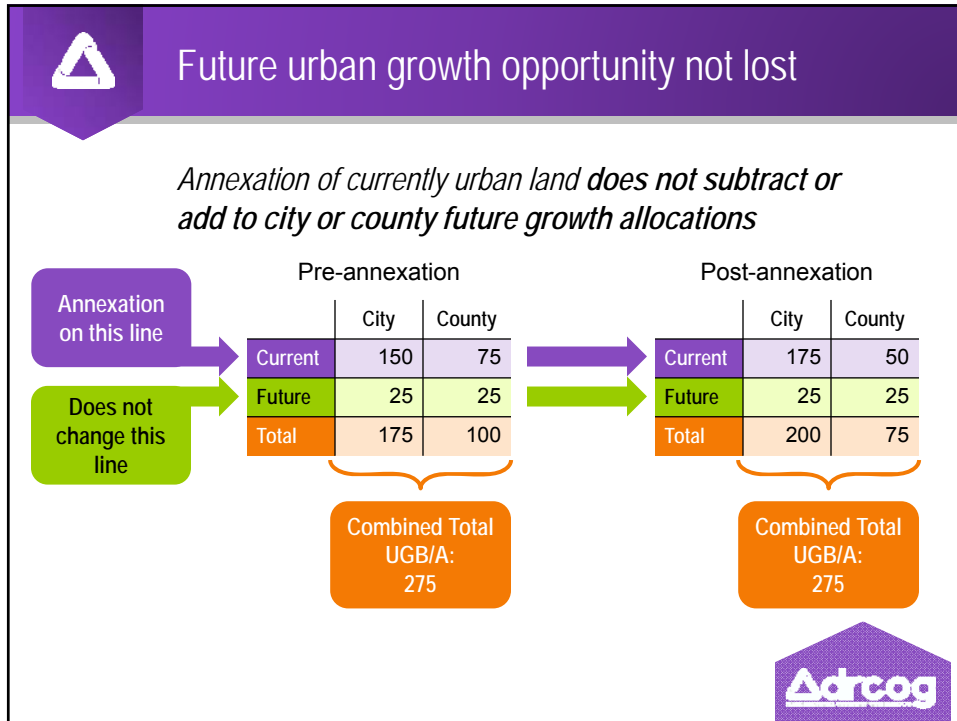


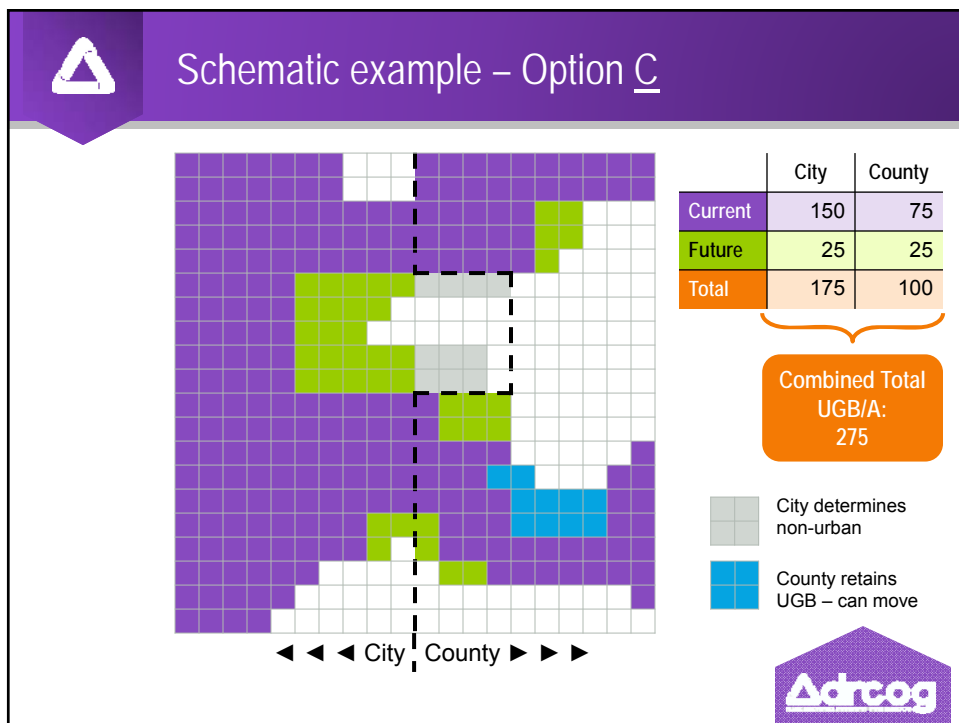
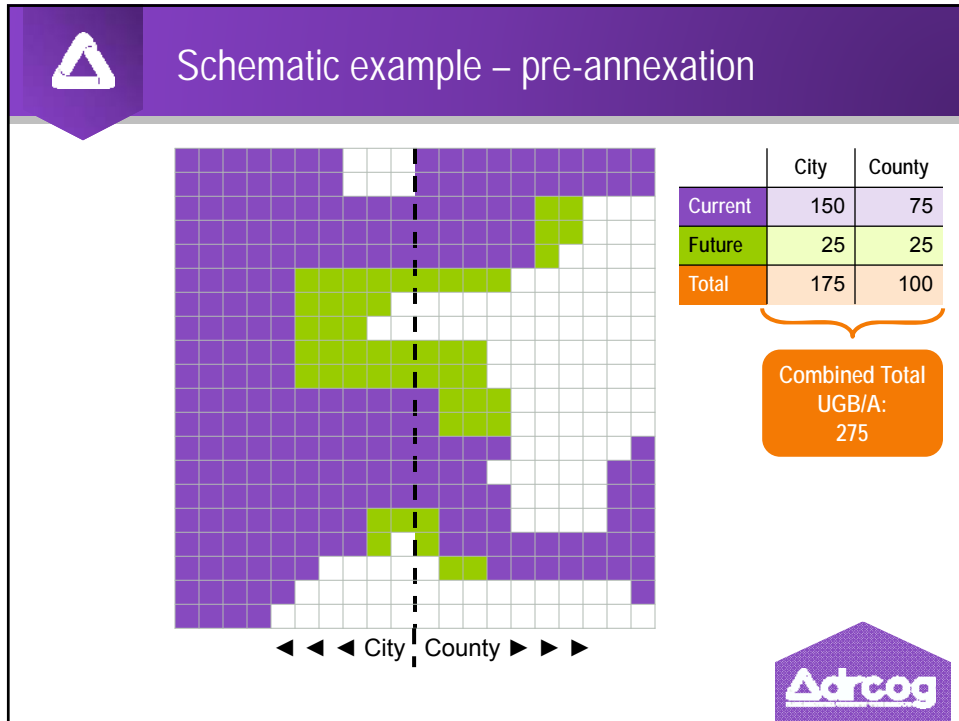


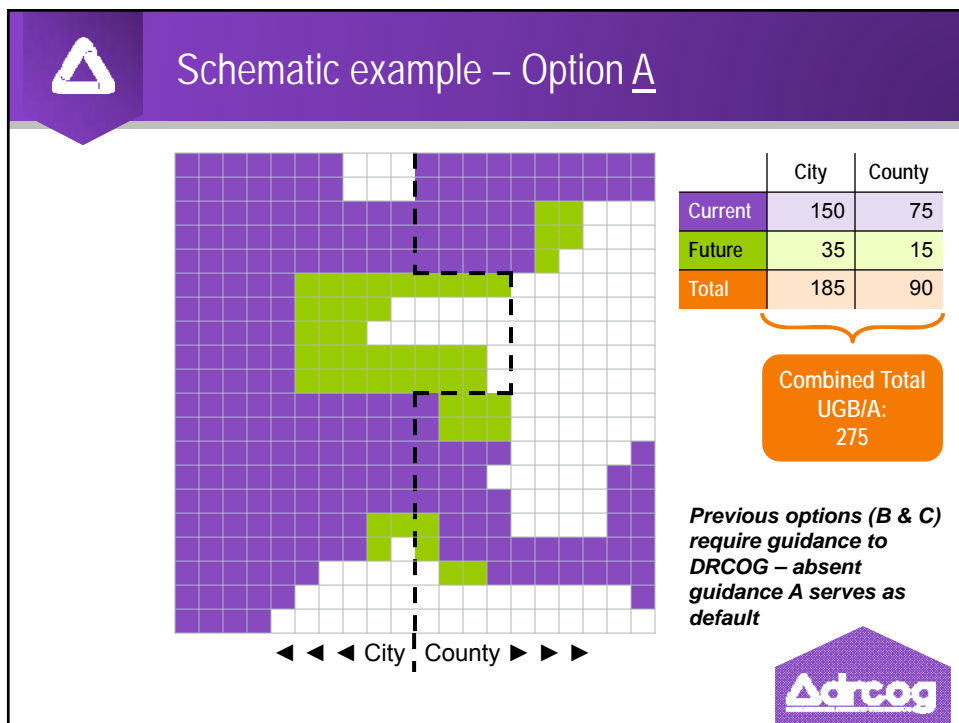
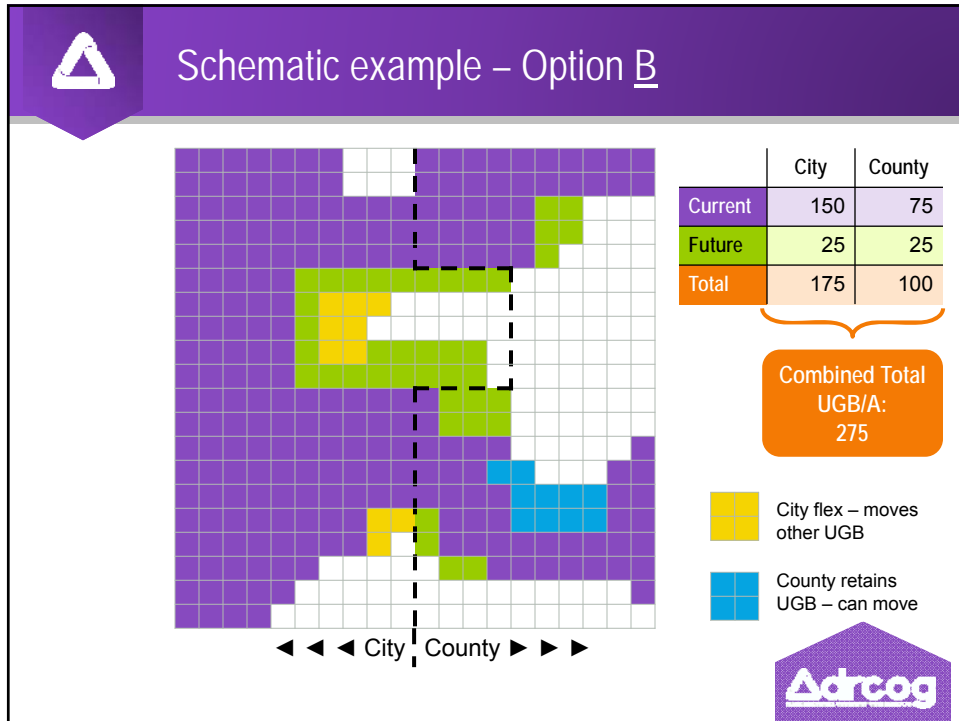

















Using the Urban Growth Area (UGA) approach


- Counties have an alternative that can help them protect their future urban growth

**Urban Growth
Boundary
(UGB)**


**Urban Growth
Area
(UGA)**

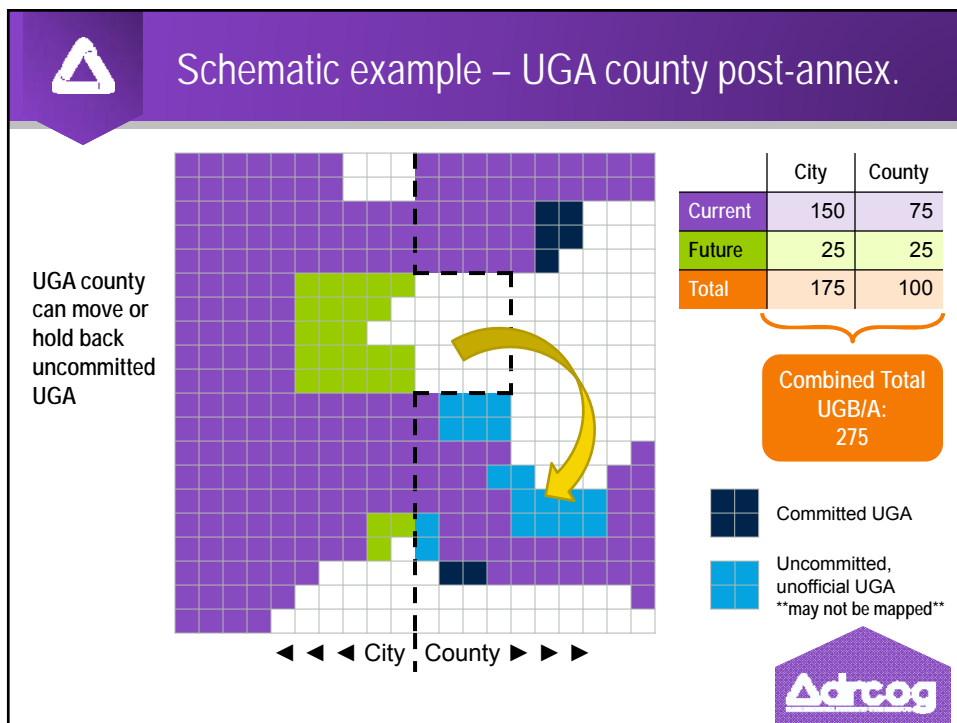
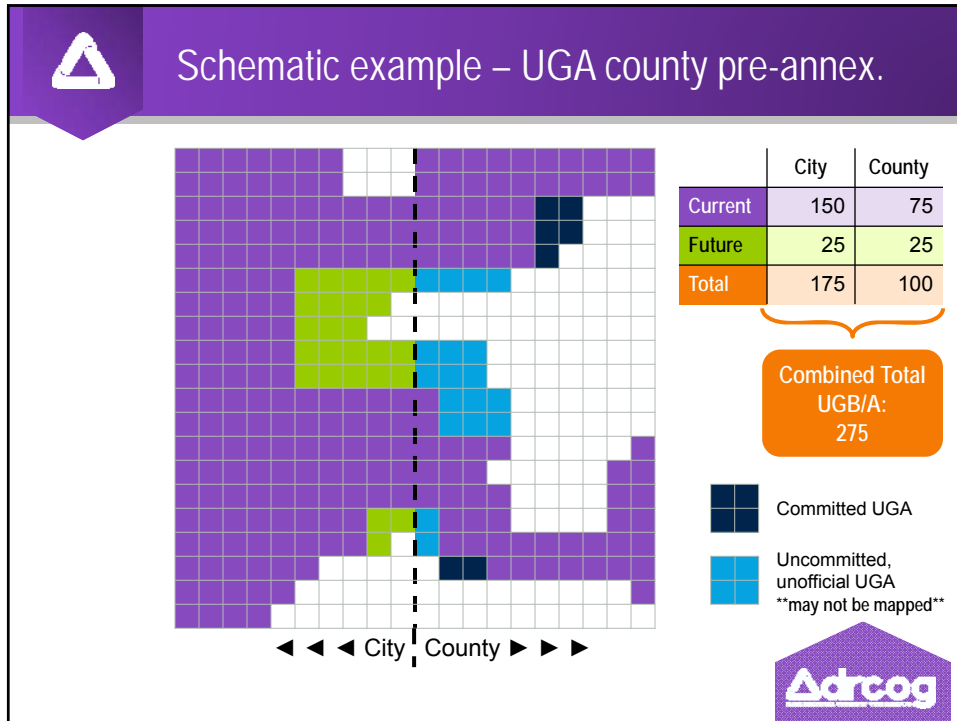



Both approaches offer flexibility

UGB communities	UGA communities*	
<div style="background-color: #f4a460; padding: 5px; margin-bottom: 5px;">Full allocation is mapped and made available</div> <div style="background-color: #f4a460; padding: 5px; margin-bottom: 5px;">Change commitment at any time</div> <div style="background-color: #f4a460; padding: 5px;">Submit UGB commitment, changes to DRCOG staff</div>	<div style="background-color: #f9d5b3; padding: 5px; margin-bottom: 5px;">Hold back full allocation</div> <div style="background-color: #f9d5b3; padding: 5px; margin-bottom: 5px;">Publically share committed areas only; change at any time</div> <div style="background-color: #f9d5b3; padding: 5px;">Share unofficial and committed UGA with DRCOG staff</div>	<div style="background-color: #fff9c4; padding: 10px; border-radius: 10px; display: inline-block;"> Helps inform regional forecasting and planning </div> <div style="font-size: 2em; color: #fff9c4; margin-top: 10px;">  </div>

* UGA communities: Arapahoe County, Adams County, Arvada, Aurora, Castle Rock, Douglas County, Jefferson County, Longmont and Thornton







PREVIOUS FEEDBACK AND STAFF OBSERVATIONS



Previous Board feedback

- Don't let UGB/A get in the way of annexation powers under state statute.
- There's nothing to compel cities and towns to work with counties on what to do with UGB/A during an annexation.
- It's not fair that counties can lose UGB/A through annexation.





Staff observations

Issues with maintaining altitude (DRCOG = 30,000 ft)

- Difficult for DRCOG staff to work out the details and piece things together after the fact

Confusing terminology

- Uses term “developed land” instead of “land classified as urban.”
 - Land might be urban based on context, not vertical development
 - Land can be classified as urban because of pre-building activities (i.e. subdivision)

Unclear intent behind notification requirement

- County must notify city if moving UGB/A from land within 3 miles of that city’s boundary



DISCUSSION QUESTIONS



Discussion questions

Focus this month on desired intent - staff will determine options for program operations and bring back in early 2017

- ▶ **Should the region's UGB/A be able to grow without Board action?**
- ▶ **Existing UGA option can protect counties against "losing" future urban growth area – should this be required for all counties?**
- ▶ **MV GDS: "The appropriate focus for DRCOG is regional, not local"**
 - UGB/A allocation vs. assignment/commitment – Does UGB/A "ownership" matter to the region?
 - Engaging or equipping our local partners – Where should DRCOG staff be putting its energy?



Urban Growth Boundary/Area (UGB/A)

UGB/A Maintenance: Annexation

Presented by:
Brad Calvert

November 2, 2016