# APPENDIX 1

## Regionally Significant Roadway Capacity Project Selection Process

# APPENDIX 1

## Regionally Significant Roadway Capacity Project Selection Process

### DRCOG-Funded Projects

DRCOG staff worked with the Transportation Advisory Committee to solicit and evaluate regionally significant roadway capacity candidate projects for regional funding. Projects in the 2035 RTP had not been thoroughly re-evaluated for many years because DRCOG's focus over the past three RTP update cycles had been on removing projects from the RTP due to the lack of revenues. With limited funds available for the 2040 Fiscally Constrained RTP (2040 FCRTP), DRCOG evaluated candidate projects to update the list of regionally significant roadway capacity projects.

Candidate projects were defined as:

- Projects already identified in the 2035 RTP with 100 percent locally derived funds
- Projects identified previously as vision unfunded projects
- New projects

DRCOG solicited candidate projects from local governments within the metropolitan planning organization area, Colorado Department of Transportation and the Regional Transportation District. Approximately 30 eligible projects were submitted for evaluation. These projects were scored together with approximately 20 projects *remaining* (construction not yet undertaken) in the 2035 RTP that were candidates for regional funding in the 2040 FCRTP.

Although several 2035 RTP projects evaluated were CDOT projects (submitted by CDOT or funded with CDOT-controlled revenues), CDOT did not submit any candidate projects for 2040 FCRTP evaluation. Instead, as described further below, CDOT separately submitted a list of fiscally constrained projects to be funded with CDOT-controlled revenues for the 2040 FCRTP. Accordingly, the project evaluation, scoring and selection process described here was applied to roadway capacity projects seeking DRCOG-controlled regional funding (STP-Metro and CMAQ).

#### Project Scoring Evaluation Criteria

The Transportation Advisory Committee and a subset work group of local government technical staff reviewed and revised the criteria used to evaluate and score roadway capacity projects in previous RTP

updates. The revised criteria, shown in Table A, were approved by the DRCOG Board in April 2014. As with previous versions, the revised criteria integrate and address Metro Vision goals and policy direction as of April 2014.

The criteria encompass several factors to evaluate projects from a high-level, comparative, long-range planning perspective using readily available data. Transportation criteria included congestion severity, cost per peak period person mile traveled, arterial roadway spacing, safety, intermodal and high security facilities, and rapid or frequent transit service. Land use criteria included serving urban and rural town centers and urban growth boundary/area status. Table A also summarizes the data used to evaluate projects and how the projects were scored.

The DRCOG Board and committees used the project evaluation and scoring process as the primary means to choose which projects to include in the fiscally constrained roadway network for air quality conformity modeling, given estimated project costs and anticipated available revenues through 2040. The evaluation and scoring process was viewed as the most objective and equitable way of making difficult project selection decisions, given limited available revenues. There were two additional considerations in this process:

- First, CDOT (separately submitted its list of fiscally constrained roadway capacity projects to be funded with CDOT-controlled revenues. CDOT later included on its project list to fully fund a few projects that DRCOG evaluated and scored. Those projects, such as the U.S. 6/Wadsworth interchange reconstruction, were removed from the DRCOG candidate project list because CDOT included them on its list.
- Second, because a few candidate projects were eligible for Congestion Mitigation and Air Quality (CMAQ) funding, those projects were addressed separately. Scores from the main candidate list were retained for CMAQ-eligible projects, to demonstrate they merited selection for funding. With demonstrated merit, DRCOG removed them from the main candidate projects list, allowing consideration of remaining projects for the limited available STP-Metro funding.

**Table A**

**Project Scoring Evaluation Criteria for 2040 RTP**

**Regionally Significant Roadway Capacity Projects**

*DRCOG Board Approved April 16, 2014*

| Criteria Category | Point Distribution Process | Maximum Points |
|---|---|---|
| 1. Congestion Severity (Existing and Future)<br>*(current or parallel facility)*<br>*Existing: Congestion Management Program (CMP) Score*<br>*Future: 2040 Existing and Commited Network Model* | Existing Congestion: Points (0-20) based on CMP score<br>Future Congestion: Points (0-10) based on peak period (6.5 hours) volume/capacity ratio (v/c) > 0.54<br>Prorate by 1-point increments based on range of values | 30 |
| 2. Cost per Peak Period Person Mile Traveled (PMT)<br>*2040 model run* | Project cost divided by peak 6.5 hour PMT (from FOCUS Travel Model)<br>Prorate by 1-point increments based on range of values | 17 |
| 3. Gap Closure<br>*completes all or part of a lane or segment gap* | 15 points if gap is completely closed,<br>8 points for partial gap closure (min 50% closure)<br>(gap must be < 5 miles) | 15 |
| 4. Arterial Roadway Spacing<br>*proximity to parallel Regional Roadway System facilities* | 5 points if nearest parallel arterial is > 3 miles away<br>2 points if > 1.5 miles away | 5 |
| 5. Regional Roadway System Classification<br>*Freeways, MRAs, or NHS-Principal Arterial segments* | 4 points for freeway<br>2 points for major regioinal arterial (MRA)<br>1 point for principal arteral on National Highway System (NHS) | 4 |
| 6. Serves Urban Centers/Rural Town Center<br>*Proximity to designated Urban Centers/Rural Town Centers* | 5 points if project is within or touching<br>3 points for roadway segment project, if within 1/2 mile | 5 |
| 7. Safety Measure<br>*Most recent 3-years of crash data* | Based on weighted crash rate (crashes/vmt)<br>(Injury and fatal crashes factored by 5)<br>8 points to 10% of projects with highest value<br>4 points to next 15% of projects | 8 |
| 8. Urban Growth Boundary/Area<br>*is project entirely within the UGB/A?* | 2 points if the project is entirely within the contiguous urban growth boundary area (including preserved land) | 2 |
| 9. Serve Major Intermodal or High Security Facility<br>*DIA, Union Station, GA airports*<br>*intermodal freight terminals, Buckley AFB* | 4 points if project is within or touching<br>2 points if within 1 mile | 4 |
| 10. Rapid/Frequent Transit Corridor<br>*support of major transit corridors* | Rapid Transit Tier 1 Corridor: 10 points.<br>15 mins. or better headway corridor (avg. weekday peak period): 5 points | 10 |
| | | **100** |

# APPENDIX 2

## 2040 Fiscally Constrained Park-n-Ride Lots and Transit Stations

# 2040 Metro Vision Regional Transportation Plan
# Appendix 2: Fiscally Constrained
# Park-n-Ride Lots and Transit Stations

| RTD Facility Name | Tier 1 Rapid Transit Corridor | Status | Parking Spaces | | | |
|---|---|---|---|---|---|---|
| | | | Existing 2015 | Spaces by 2025 | Total 2040 | Net Change (2015-2040) |
| **Rapid Transit Stations with Parking** | | | | | | |
| 13th Ave | I-225 | New | 0 | 250 | 690 | 690 |
| 30th/Downing | Central Corridor | Existing | 27 | 27 | 27 | 0 |
| 38th/Blake | East Corridor | New | 0 | 200 | 500 | 500 |
| 40th/Colorado | East Corridor | New | 0 | 200 | 1,800 | 1,800 |
| 41st/Fox | Gold Line (may be shared with NW Rail in future) | New | 0 | 500 | 770 | 770 |
| 48th and Brighton at National Western Center | North Metro | New | 0 | 40 | 40 | 40 |
| 60th/Sheridan-Arvada Gold Strike | Gold Line | New | 0 | 330 | 330 | 330 |
| 61st/Peña Blvd | East Corridor | New | 0 | 800 | 800 | 800 |
| Alameda | Central Corridor | Existing | 302 | 302 | 302 | 0 |
| Arapahoe at Village Center | Southeast Corridor | Existing | 1,115 | 817 | 817 | -298 |
| Arvada Ridge | Gold Line | New | 0 | 280 | 280 | 280 |
| Aurora Metro Center | I-225 | New | 0 | 200 | 200 | 200 |
| Belleview | Southeast Corridor | Existing | 59 | 59 | 59 | 0 |
| Central Park | East Corridor | New | 0 | 1,500 | 1,500 | 1,500 |
| Clear Creek/Federal | Gold Line | New | 0 | 280 | 370 | 370 |
| Colorado | Southeast Corridor | Existing | 363 | 363 | 363 | 0 |
| Commerce City/72nd | North Metro | New | 0 | 359 | 330 | 330 |
| County Line | Southeast Corridor | Existing | 388 | 388 | 388 | 0 |
| Dayton | Southeast Corridor | Existing | 250 | 250 | 250 | 0 |
| Decatur-Federal | West Corridor | Existing | 1,900 | 474 | 474 | -1,426 |
| Downtown Longmont | Northwest Rail | New | 0 | 0 | 439 | 439 |
| Dry Creek | Southeast Corridor | Existing | 235 | 235 | 235 | 0 |
| Eastlake at 124th | North Metro | New | 0 | 410 | 960 | 960 |
| Englewood | Southwest Corridor | Expansion | 910 | 910 | 1,350 | 440 |
| Federal/Evans | Southwest Corridor | Existing | 99 | 99 | 99 | 0 |
| Federal Center | West Corridor | Existing | 1,000 | 1,000 | 1,000 | 0 |
| I-25 / Broadway | Central Corridor | Existing | 1,248 | 1,040 | 740 | -508 |
| Iliff | I-225 | New | 0 | 600 | 600 | 600 |
| Jefferson County-Golden | West Corridor | Existing | 705 | 705 | 705 | 0 |
| Lakewood-Wadsworth | West Corridor | Existing | 1,000 | 1,000 | 1,000 | 0 |
| Lincoln | Southeast Corridor | Existing | 1,734 | 1,734 | 1,734 | 0 |
| Littleton/Downtown | Southwest Corridor | Existing | 361 | 361 | 361 | 0 |
| Littleton/Mineral Station | Southwest Corridor | Existing | 1,227 | 1,227 | 1,227 | 0 |
| Nine Mile | Southeast Corridor | Existing | 1,225 | 1,225 | 1,225 | 0 |
| Northglenn/112th | North Metro | New | 0 | 316 | 1,200 | 1,200 |
| Oak | West Corridor | Existing | 200 | 200 | 200 | 0 |
| Orchard | Southeast Corridor | Existing | 48 | 48 | 48 | 0 |
| Original Thornton at 88th | North Metro | New | 0 | 561 | 1,500 | 1,500 |
| Pecos Junction | Gold Line (may be shared with NW Rail in future) | New | 0 | 300 | 300 | 300 |
| Peoria | I-225 / East Corridor | New | 0 | 550 | 1,900 | 1,900 |
| RidgeGate Parkway | Southeast Corridor | New | 0 | 0 | 2,100 | 2,100 |
| Second Avenue/Abilene | I-225 | New | 0 | 200 | 200 | 200 |
| Sheridan | West Corridor | Existing | 800 | 800 | 800 | 0 |
| Southmoor | Southeast Corridor | Existing | 788 | 788 | 788 | 0 |
| Thornton Crossroads at 104th | North Metro | New | 0 | 907 | 1,460 | 1,460 |
| University of Denver Station | Southeast Corridor | Existing | 540 | 540 | 540 | 0 |
| Westminster | Northwest Rail | New | 0 | 350 | 925 | 925 |
| Yale | Southeast Corridor | Existing | 129 | 129 | 129 | 0 |
| ***Subtotal*** | | | **16,653** | **23,854** | **34,055** | **17,402** |

# 2040 Metro Vision Regional Transportation Plan
# Appendix 2: Fiscally Constrained
# Park-n-Ride Lots and Transit Stations

| RTD Facility Name | Tier 1 Rapid Transit Corridor | Status | Parking Spaces | | | |
|---|---|---|---|---|---|---|
| | | | Existing 2015 | Spaces by 2025 | Total 2040 | Net Change (2015-2040) |
| **Existing PnRs (Future Rapid Transit Stations) with Parking** | | | | | | |
| 40th/Airport Blvd - Gateway Park | East Corridor | Expansion | 1,079 | 1,079 | 2,200 | 1,121 |
| Olde Town Arvada | Gold Line | Expansion | 200 | 200 | 400 | 200 |
| Table Mesa | US-36 BRT | Existing | 824 | 824 | 824 | 0 |
| US 36/Broomfield | US-36 BRT | Existing | 940 | 940 | 1,810 | 870 |
| US-36 / Church Ranch | US-36 BRT | Existing | 396 | 396 | 396 | 0 |
| US-36/East Flatiron Circle | US-36 BRT | Existing | 264 | 264 | 264 | 0 |
| US-36 / McCaslin | US-36 BRT | Existing | 466 | 466 | 466 | 0 |
| US-36/ Sheridan | US-36 BRT | Existing | 1,310 | 1,310 | 1,310 | 0 |
| Wheat Ridge & Ward | Gold Line | Existing | 491 | 440 | 440 | -51 |
| ***Subtotal*** | | | **5,970** | **5,919** | **8,110** | **2,140** |
| **Rapid Transit Stations without Parking** | | | | | | |
| 10th/Osage | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 16th St/California | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 16th St/Stout | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 18th St/California | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 18th St/Stout | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 20th St/Welton | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 25th St/Welton | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 27th St/Welton | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| 29th St/Welton (inactive) | Central Corridor | Existing (inactive) | N/A | N/A | N/A | N/A |
| Auraria at Colfax | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| Auraria West | Central Platte Valley | Existing | N/A | N/A | N/A | N/A |
| Colfax | I-225 | New | N/A | N/A | N/A | N/A |
| Denver Airport | East Corridor | New | N/A | N/A | N/A | N/A |
| Fitzsimons | I-225 | New | N/A | N/A | N/A | N/A |
| Florida | I-225 | Existing | N/A | N/A | N/A | N/A |
| Garrison | West Corridor | Existing | N/A | N/A | N/A | N/A |
| Knox | West Corridor | Existing | N/A | N/A | N/A | N/A |
| Lamar | West Corridor | Existing | N/A | N/A | N/A | N/A |
| Lone Tree City Center | Southeast Corridor | New | N/A | N/A | N/A | N/A |
| Louisiana / Pearl | Southeast Corridor | Existing | N/A | N/A | N/A | N/A |
| Oxford-City of Sheridan | Southwest Corridor | Existing | N/A | N/A | N/A | N/A |
| Pepsi Center/ Elitch Gardens | Central Platte Valley | Existing | N/A | N/A | N/A | N/A |
| Perry | West Corridor | Existing | N/A | N/A | N/A | N/A |
| Red Rocks College | West Corridor | Existing | N/A | N/A | N/A | N/A |
| Sports Authority Field at Mile High | Central Platte Valley | Existing | N/A | N/A | N/A | N/A |
| Sky Ridge | Southeast Corridor | New | N/A | N/A | N/A | N/A |
| Theatre District/Convention Center | Central Corridor | Existing | N/A | N/A | N/A | N/A |
| **Transit/Transfer Centers** | | | | | | |
| Boulder Junction at Depot Square Station | | Existing | 75 | 75 | 75 | 0 |
| Civic Center Station | | Existing | 0 | 0 | 0 | 0 |
| Denver Union Station | | Existing | 0 | 0 | 0 | 0 |
| Downtown Boulder Station | | Existing | 0 | 0 | 0 | 0 |
| ***Subtotal*** | | | **75** | **75** | **75** | **0** |

# 2040 Metro Vision Regional Transportation Plan
# Appendix 2: Fiscally Constrained
# Park-n-Ride Lots and Transit Stations

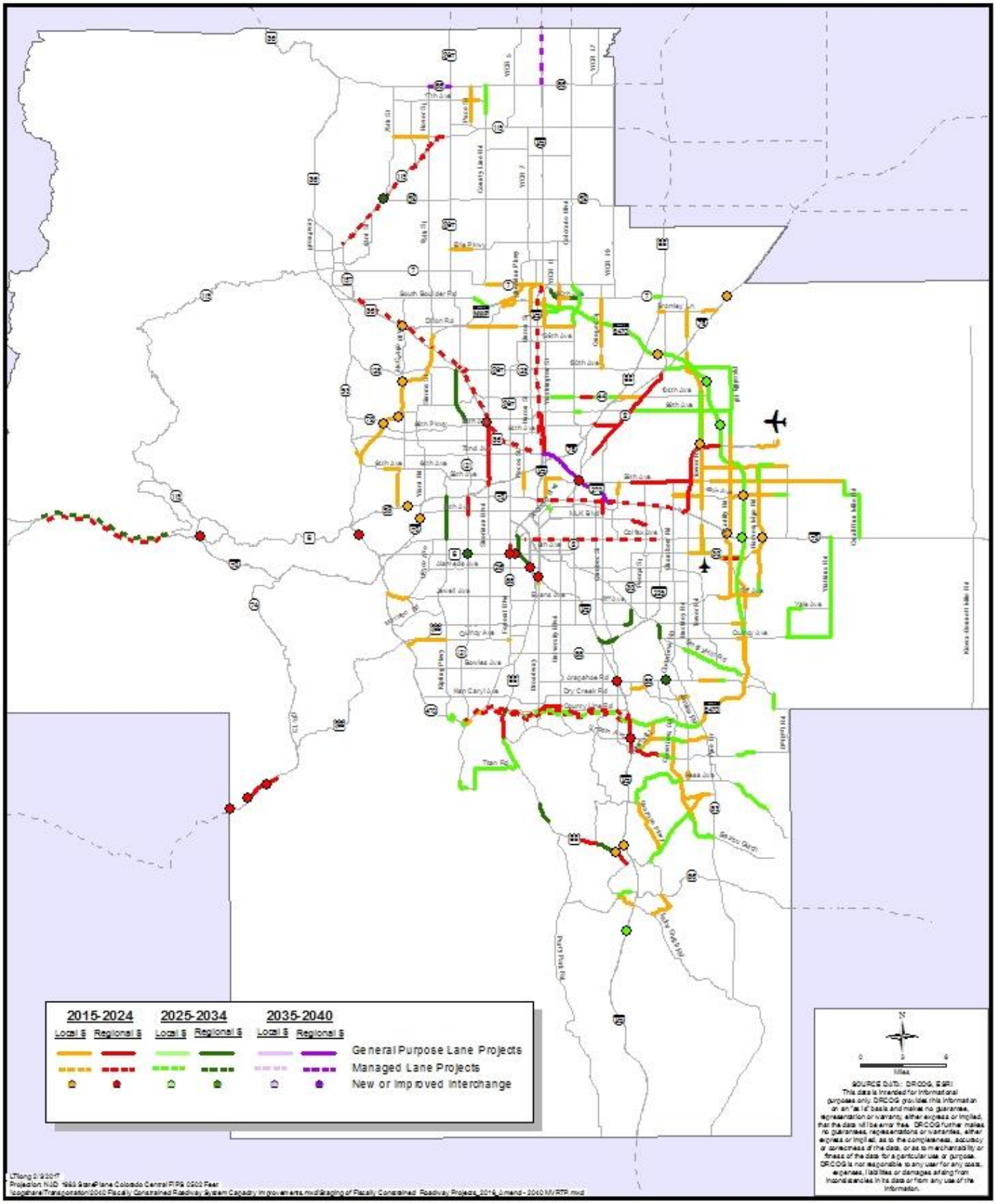
| Facility Name | Status | Parking Spaces | | | |
|---|---|---|---|---|---|
| | | Existing 2015 | Spaces by 2025 | Total 2040 | Net Change (2015-2040) |
| **RTD park-n-Ride Lots** | | | | | |
| 8th/Coffman | Existing | 97 | 197 | 197 | 100 |
| 27th Way/Broadway | Existing | 59 | 59 | 59 | 0 |
| 39th St/Table Mesa Drive | Existing | 40 | 40 | 40 | 0 |
| 70th/Broadway | Existing | 308 | 308 | 308 | 0 |
| 104th Ave/Revere | Existing | 89 | 89 | 89 | 0 |
| Alameda/Havana | Existing | 128 | 128 | 128 | 0 |
| Aspen Park | Existing | 162 | 162 | 162 | 0 |
| Bergen Park | Existing | 160 | 160 | 160 | 0 |
| Broadway Marketplace | Existing | 221 | 221 | 221 | 0 |
| Boulder Church of the Nazarene | Existing | 49 | 49 | 49 | 0 |
| C-470 / University Blvd | Existing | 440 | 440 | 440 | 0 |
| El Rancho | Existing | 36 | 36 | 36 | 0 |
| Evergreen | Existing | 45 | 45 | 45 | 0 |
| Genesee Park | Existing | 21 | 21 | 21 | 0 |
| Highlands Ranch Town Center | Existing | 177 | 177 | 177 | 0 |
| Hwy 119 / Niwot | Existing | 28 | 28 | 28 | 0 |
| Ken Caryl / C-470 | Existing | 268 | 268 | 268 | 0 |
| Lafayette | Existing | 136 | 136 | 136 | 0 |
| Lincoln/Jordan | Existing | 102 | 102 | 102 | 0 |
| Longmont (to be replaced by Downtown Longmont) | Existing | 101 | 0 | 0 | -101 |
| Lutheran Church | Existing | 41 | 41 | 41 | 0 |
| Lyons | Existing | 27 | 27 | 27 | 0 |
| Montbello | Existing | 84 | 84 | 84 | 0 |
| Nederland | Existing | 75 | 75 | 75 | 0 |
| Olympic Park | Existing | 152 | 152 | 152 | 0 |
| Paradise Hills | Existing | 26 | 26 | 26 | 0 |
| Parker | Existing | 173 | 173 | 173 | 0 |
| Pine Junction | Existing | 92 | 92 | 92 | 0 |
| Pinery | Existing | 79 | 79 | 79 | 0 |
| SH-72/SH-93 | Existing | 14 | 14 | 14 | 0 |
| Smoky Hill/Picadilly | Existing | 55 | 55 | 55 | 0 |
| Southwest Plaza | Existing | 200 | 200 | 200 | 0 |
| Stapleton (Replaced by Central Park Station in 2016) | Existing | 1,314 | 0 | 0 | -1,314 |
| Tantra Drive/Table Mesa | Existing | 105 | 105 | 105 | 0 |
| Thornton | Existing | 817 | 817 | 817 | 0 |
| US-285 / Mountain View | Existing | 183 | 183 | 183 | 0 |
| US-285 / Twin Forks | Existing | 77 | 77 | 77 | 0 |
| US-287/Niwot Rd | Existing | 40 | 40 | 40 | 0 |
| US-287/Ute Rd (State Highway 66) | New | 0 | 150 | 150 | 150 |
| US-85 / 72nd Avenue (to be replaced by 72nd Avenue Station) | Existing | 83 | 0 | 0 | -83 |
| US-85 / Bridge St | Existing | 234 | 234 | 234 | 0 |
| Wadsworth / Hampden | Existing | 284 | 284 | 284 | 0 |
| Wagon Rd | Existing | 1,540 | 1,540 | 1,540 | 0 |
| ***Subtotal*** | | **8,362** | **7,114** | **7,114** | **-1,248** |
| **CDOT Carpool Lots** | | | | | |
| Castle Pines Parkway | Existing | 106 | 106 | 106 | 0 |
| Hogback | Existing | 512 | 512 | 512 | 0 |
| I-25/SH-52 | Existing | 94 | 94 | 94 | 0 |
| I-25/SH-66 | Existing | 56 | 56 | 56 | 0 |
| I-25/SH-119 | Existing | 102 | 102 | 102 | 0 |
| I-25/Weld County Road 8 | Existing | 56 | 56 | 56 | 0 |
| ***Subtotal*** | | **926** | **926** | **926** | **0** |
| ***Grand Total Parking Spaces*** | | **31,986** | **37,888** | **50,280** | **18,294** |

# APPENDIX 3

## Staging of Fiscally Constrained Roadway Projects (2015, 2025, 2035 and 2040)

# Staging of Fiscally Constrained Roadway Capacity Projects

2040 Metro Vision
Regional Transportation Plan

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Projection: NAD 1983 StatePlane Colorado Central FIPS 0502 Feet
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# APPENDIX 4

## Fiscally Constrained Roadway and Rapid Transit Capacity Improvements and Cost Allocations (Fiscal Years 2015-2040)

# Appendix 4 - 2040 Metro Vision Regional Transportation Plan
## Fiscally Constrained Roadway & Rapid Transit Capacity Improvements
### Remaining Project Cost Allocations (FY 2016 - 2040)
*February 2017*

| Roadway | CDOT Road | Project Location (Limits) | Improvement Type | Length (Miles) | Network Staging Period | Remaining Project Cost (FY '15 $millions) | County |
|---|---|---|---|---|---|---|---|
| **A. Regional Roadway System Projects** | | | | | | | |
| **1. Regionally Funded with DRCOG-Controlled Funds** | | | | | | | |
| 6th Pkwy. | | SH-30/Liverpool St. to E-470 | New 2 Lane Road | 1.3 | 2015-2024 | $19.9 | Arapahoe |
| 56th Ave. | | Havana St. to Pena Blvd. | Widen from 2 to 6 Lanes | 4.3 | 2015-2024 | $45.0 | Denver |
| 88th Ave. | | I-76 NB Ramps to SH-2 | Widen from 2 to 4 Lanes | 1.7 | 2015-2024 | $21.5 | Adams |
| 104th Ave. | SH-44 | Grandview Ponds to McKay Rd. | Widen from 2 to 4 Lanes | 0.7 | 2015-2024 | $8.1 | Adams |
| 120th Ave. | | Allison St. to Emerald St. | New 6 Lanes | 0.4 | 2015-2024 | $0.0 (1) | Broomfield |
| Arapahoe Rd. | SH-88 | Havana St. (or Jordan Rd.) | New Grade Separation | | 2025-2034 | $16.0 | Arapahoe |
| County Line Rd. | | Phillips St. to University Blvd. | Widen from 2 to 4 Lanes | 1.2 | 2015-2024 | $9.5 | Douglas |
| Hampden Ave./ S. Havana St. | SH-30 | Florence St. to s/o Yale Ave. | Widen from 5 to 6 Lanes | 1.4 | 2025-2034 | $14.0 | Denver |
| I-25 | I-25 | Lincoln Ave. | Interchange Capacity | | 2015-2024 | $49.4 | Douglas |
| I-25 | I-25 | Broadway | Interchange Capacity | | 2015-2024 | $50.0 | Denver |
| I-25 | I-25 | Ridgegate Pkwy. to County Line Rd. S. Ramps | Widen from 6 to 8 Lanes | 2.7 | 2015-2024 | $0.0 (1) | Douglas |
| I-70 | I-70 | I-25 to Chambers Rd. | Add 2 New Managed Lanes | 3.8 | 2015-2024 | $1,175.7 (2) | Denver/Adams |
| Kipling St. | SH-391 | Colfax Ave. to I-70 | Widen from 4 to 6 Lanes | 3.0 | 2025-2034 | $18.0 | Jefferson |
| Martin Luther King Jr. Blvd. | | Havana St./Iola St. to Peoria St. | Widen 2 to 4 Lanes; New 4 Lane Road | 1.0 | 2015-2024 | $15.0 | Denver |
| Parker Rd. | SH-83 | Quincy Ave. to Hampden Ave. | Widen from 6 to 8 Lanes | 1.0 | 2025-2034 | $18.5 | Arapahoe |
| Pena Blvd. | | I-70 to E-470 | Widen from 4 to 8 Lanes | 6.4 | 2015-2024 | $55.0 | Denver |
| Quebec St. | SH-35 | 35th Ave. to Sand Creek Dr. S. | Widen from 4 to 6 Lanes | 1.2 | 2015-2024 | $11.0 | Denver |
| Ridgegate Pkwy. | | Havana St. to Lone Tree E. City Limit | Widen from 2 to 4 Lanes | 1.8 | 2015-2024 | $8.0 | Douglas |
| SH-7 | SH-7 | 164th Ave. to Dahlia St. | Widen from 2 to 4 Lanes | 2.2 | 2025-2034 | $24.0 | Adams |
| | | *164th Ave. to York St.* | *Widen from 2 to 4 Lanes* | *0.8* | *2025-2034* | | *Adams* |
| | | *Big Dry Creek to Dahlia St.* | *Widen from 2 to 4 Lanes* | *0.8* | *2025-20234* | | *Adams* |
| Sheridan Blvd. | SH-95 | I-76 to US-36 | Widen from 4 to 6 Lanes | 4.5 | 2015-2024 | $23.0 | Adams/Jefferson |
| US-6 | US-6 | Federal Blvd. to Bryant St. | Interchange Capacity | | 2015-2024 | $0.0 (1) | Denver |
| US-36 | US-36 | I-25 Express Lanes to Table Mesa Dr. | Add HOT Lanes | 17.2 | 2015-2024 | $0.0 (1) | Regional |
| US-36 | US-36 | Sheridan Blvd. | Interchange Capacity | | 2015-2024 | $0.0 (1) | Jefferson |
| US-85 | US-85 | Blakeland Dr. to County Line Rd. | Widen from 4 to 6 Lanes | 0.5 | 2025-2034 | $26.0 | Douglas |
| US-85 | US-85 | Highlands Ranch Pkwy. to Blakeland Dr. | Widen from 4 to 6 Lanes | 1.6 | 2015-2024 | $24.1 | Douglas |
| Wadsworth Blvd. | SH-121 | 35th Ave. to 48th Ave. | Widen from 4 to 6 Lanes | 1.2 | 2015-2024 | $31.0 | Jefferson |
| Wadsworth Pkwy. | SH-121 | 92nd Ave. to SH-128 | Widen from 4 to 6 Lanes | 3.7 | 2025-2034 | $31.6 | Jefferson |
| | | | | | **A.1. Subtotal:** | **$1,694.3** | |

**Notes**

(1) Project funds have been fully obligated prior to FY '15; project is under construction.

(2) Includes DRCOG contribution of $50 million. CDOT-derived funds make up $1,125.7 billion.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **2. Regionally Funded with CDOT-Controlled Funds** | | | | | | | |
| C-470 | C-470 | Wadsworth Blvd. to I-25 | Add Toll Managed Lanes | | | $220.0 | Douglas/Jefferson |
| | | *EB: Wadsworth Blvd. to I-25* | *Add 1 New Toll/Managed Lane* | *10.8* | *2015-2024* | | *Douglas/Jefferson* |
| | | *WB: I-25 to Colorado Blvd.* | *Add 2 New Toll/Managed Lanes* | *4.1* | *2015-2024* | | *Douglas* |
| | | *WB: Colorado Blvd. to Wadsworth Blvd.* | *Add 1 New Toll/Managed Lane* | *8.2* | *2015-2024* | | *Douglas/Jefferson* |
| Federal Blvd. | SH-88 | 6th Ave. to Howard Pl. | Widen from 5 to 6 Lanes | 0.8 | 2015-2024 | $23.4 | Denver |
| I-25 | I-25 | Arapahoe Rd. | Interchange Capacity | | 2015-2024 | $50.4 | Arapahoe |
| I-25 | I-25 | Santa Fe Dr. (US-85) to Alameda Ave. | Interchange Capacity | | 2015-2024 | $27.0 | Denver |
| I-25 | I-25 | Alameda Ave. to Walnut St. (Bronco Arch) | Add 1 New Lane in each direction | 2.6 | 2025-2034 | $30.0 | Denver |
| I-25 | I-25 | US-36 to Thornton Pkwy. | Add 1 New SB Lane | 2.8 | 2015-2024 | $30.0 | Adams |
| I-25 | I-25 | US-36 to 120th Ave. | Add 1 Toll/Managed Lane each direction | 5.9 | 2015-2024 | $68.5 | Adams |
| I-25 | I-25 | 120th Ave. to SH-7 | Add 1 Toll/Managed Lane each direction | 6.0 | 2015-2024 | $55.0 | Adams/Broomfield |
| I-25 | I-25 | SH-66 to WCR 38 (DRCOG Boundary) | Add 1 Toll/Managed Lane each direction | 4.1 | 2035-2040 | $92.0 | Weld |
| I-225 | I-225 | I-25 to Yosemite St. | Interchange Capacity | | 2025-2034 | $43.0 | Denver |
| I-70 | I-70 | Empire Junction (US-40) to Twin Tunnels | Add/Convert 1 new EB Peak Period Managed Lane | 9.6 | 2015-2024 | $24.0 | Clear Creek |
| I-70 | I-70 | Twin Tunnels to Empire Junction (US-40) | Add 1 WB Peak Period Managed Lane | 9.6 | 2025-2034 | $50.0 | Clear Creek |
| I-70 | I-70 | Vicinity of US-6 and Floyd Hill | TBD | | 2015-2024 | $100.0 | Clear Creek |

## Appendix 4 - 2040 Metro Vision Regional Transportation Plan
## Fiscally Constrained Roadway & Rapid Transit Capacity Improvements
## Remaining Project Cost Allocations (FY 2016 - 2040)

***February 2017***

| Roadway | CDOT Road | Project Location (Limits) | Improvement Type | Length (Miles) | Network Staging Period | Remaining Project Cost (FY '15 $millions) | County |
|---|---|---|---|---|---|---|---|
| **2. Regionally Funded with CDOT-Controlled Funds (cont'd.)** | | | | | | | |
| I-270 | I-270 | I-25 to I-70 | Widen from 4 to 6 Lanes | 6.3 | 2035-2040 | $160.0 | Adams |
| I-270 | I-270 | Vasquez Blvd. (US 6/85) | Interchange Capacity | | 2015-2024 | $60.0 | Adams |
| SH-66 | SH-66 | Hover St. to Main St. (US-287) | Widen from 2 to 4 Lanes | 1.5 | 2035-2040 | $19.0 | Boulder |
| SH-119 | SH-119 | SH-52 | New Interchange | | 2025-2034 | $30.0 | Boulder |
| US-6 | US-6 | 19th St. | New Interchange | | 2015-2024 | $20.0 | Jefferson |
| US-6 | US-6 | Wadsworth Blvd. | Interchange Capacity | | 2025-2034 | $60.0 | Jefferson |
| US-85 | US-85 | Meadows Pkwy. to Louviers Ave. | Widen from 2 to 4 Lanes | 5.7 | | $59.0 | Douglas |
| | | *Meadows Pkwy. to Castlegate* | | | *2015-2024* | | |
| | | *Castlegate to Daniels Park Rd.* | | | *2025-2034* | | |
| | | *Daniels Park Rd. to SH-67 (Sedalia)* | | | *2015-2024* | | |
| | | *MP 191.75 to Louviers Ave.* | | | *2025-2034* | | |
| US-285 | US-285 | Pine Junction to Richmond Hill | | | | | |
| | | *Pine Valley Rd. (CR 126)/Mt Evans Blvd.* | *New Interchange* | | *2015-2024* | $14.0 | Jefferson |
| | | *Kings Valley Dr.* | *New Interchange* | | *2015-2024* | $11.0 | Jefferson |
| | | *Kings Valley Dr. to Richmond Hill Rd.* | *Widen from 3 to 4 Lanes (Add 1 SB Lane)* | 0.9 | *2015-2024* | $10.0 | Jefferson |
| | | *Shaffers Crossing to Kings Valley Dr.* | *Widen from 3 to 4 Lanes (Add 1 SB Lane)* | 1.4 | *2015-2024* | $12.0 | Jefferson |
| | | *Parker Ave.* | *New Interchange* | | *2015-2024* | $9.0 | Jefferson |
| | | | | | **A.2. Subtotal:** | **$1,277.3** | |
| **3. 100% Locally Derived Funding** | | | | | | | |
| 6th Ave. | | Airport Blvd. to Tower Rd. | Widen from 2 to 6 Lanes | 1.0 | 2015-2024 | $10.2 | Arapahoe |
| 6th Ave. | SH-30 | Tower Rd. to 6th Pkwy. | Widen from 2 to 6 Lanes | 1.6 | 2015-2024 | $14.1 | Arapahoe |
| 6th Pkwy. | | SH-30 to E-470 | Widen from 2 to 6 Lanes | 1.3 | 2025-2034 | $34.9 | Arapahoe |
| 6th Pkwy. | | E-470 to Gun Club Rd. | Widen from 2 to 6 Lanes | 0.3 | 2015-2024 | $4.9 | Arapahoe |
| 6th Ave. | | 6th Pkwy. to Harvest Mile Rd. | Widen from 2 to 6 Lanes | 0.4 | 2015-2024 | $13.2 | Arapahoe |
| 17th Ave. | | Alpine St. to Ute Creek Dr. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $2.3 | Boulder |
| 35th Ave. | | Brighton Blvd. to Walnut St. | Widen from 2 to 4 Lanes | 0.3 | 2025-2034 | $2.5 | Denver |
| 48th Ave. | | Imboden Rd. to Quail Run Rd. | Widen from 2 to 6 Lanes | 1.0 | 2025-2034 | $9.7 | Adams |
| 48th Ave. | | Picadilly Rd. to Powhaton Rd. | New 6 Lanes | 3.0 | 2015-2024 | $40.7 | Adams |
| 48th Ave. | | Powhaton Rd. to Monaghan Rd. | New 6 Lanes | 1.0 | 2025-2034 | $13.6 | Adams |
| 56th Ave. | | E-470 to Imboden Rd. | Widen from 2 to 6 Lanes | 7.0 | 2015-2024 | $67.9 | Adams |
| 56th Ave. | | Picadilly Rd. to E-470 | Widen from 2 to 6 Lanes | 1.0 | 2015-2024 | $9.7 | Adams |
| 56th Ave. | | Dunkirk St. to Himalaya St. | Widen from 4 to 6 Lanes | 0.5 | 2015-2024 | $11.5 | Denver |
| 56th Ave. | | Himalaya St. to Picadilly Rd. | Widen from 2 to 6 Lanes | 1.0 | 2015-2024 | $5.8 | Denver |
| 56th Ave. | | Pena Blvd. to Tower Rd. | Widen from 4 to 6 Lanes | 0.7 | 2015-2024 | $17.3 | Denver |
| 58th Ave. | | Washington St. to York St. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $10.4 | Adams |
| 64th Ave. | | Denver/Aurora City Limit to Himalaya St. | Widen from 2 to 6 Lanes | 0.5 | 2015-2024 | $6.5 | Adams |
| 64th Ave. | | Harvest Mile Rd. to Powhaton Rd. | New 2 Lanes | 1.0 | 2015-2024 | $6.5 | Adams |
| 64th Ave. | | Harvest Mile Rd. to Powhaton Rd. | Widen from 2 to 4 Lanes | 1.0 | 2025-2034 | $10.9 | Adams |
| 64th Ave. | | Himalaya Rd. to Harvest Mile Rd. | Widen from 2 to 4 Lanes | 3.0 | 2015-2024 | $12.3 | Adams |
| 64th Ave. | | Powhaton Rd. to Monaghan Rd. | New 4 Lanes | 1.0 | 2015-2024 | $6.7 | Adams |
| 64th Ave. | | Tower Rd. to Denver/Aurora City Limits | Widen from 2 to 4 Lanes | 0.5 | 2015-2024 | $0.7 | Denver |
| 64th Ave. | | Terry St. to Kendrick Dr. | Widen from 2 to 4 Lanes | 1.2 | 2015-2024 | $6.4 | Jefferson |
| 96th Ave. | | SH-2 to Tower Road | Widen from 2 to 4 Lanes | 5.0 | 2025-2034 | $46.7 | Adams |
| 96th Ave. | | Tower Rd. to Picadilly Rd. | Widen from 2 to 6 Lanes | 2.0 | 2025-2034 | $14.7 | Adams |
| 96th St. | | 96th St. at Northwest Pkwy. to SH-128 | Add Toll Lanes | 2.3 | 2015-2024 | $39.4 | Broomfield |
| 104th Ave. | | Marion St to Colorado Blvd | Widen from 4 to 6 Lanes | 1.6 | 2025-2034 | $6.3 | Adams |
| 104th Ave. | | US-85 to SH-2 | Widen from 2 to 4 Lanes | 1.8 | 2015-2024 | $41.2 | Adams |
| 104th Ave. | SH-44 | McKay Road to US-85 | Widen from 2 to 4 Lanes | 1.9 | 2025-2034 | $40.6 | Adams |
| 120th Ave. | | Sable Blvd. to E-470 | Widen from 2 to 6 Lanes | 2.0 | 2025-2034 | $29.7 | Adams |
| 120th Ave. | | E-470 to Picadilly Rd. | Widen from 2 to 6 Lanes | 2.6 | 2025-2034 | $15.5 | Adams |
| 144th Ave. | | Washington St. to York St. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $12.8 | Adams |
| 144th Ave. | | York St. to Colorado Blvd. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $10.4 | Adams |
| 144th Ave. | | US-287 to Zuni St. | Widen from 2 to 4 Lanes | 3.5 | 2015-2024 | $21.2 | Broomfield |
| 152nd Ave. | | Washington St. to York St. | Widen from 2 to 4 Lanes | 1.2 | 2025-2034 | $11.1 | Adams |

## Appendix 4 - 2040 Metro Vision Regional Transportation Plan
## Fiscally Constrained Roadway & Rapid Transit Capacity Improvements
### Remaining Project Cost Allocations (FY 2016 - 2040)
*February 2017*

| Roadway | CDOT Road | Project Location (Limits) | Improvement Type | Length (Miles) | Network Staging Period | Remaining Project Cost (FY '15 $millions) | County |
|---|---|---|---|---|---|---|---|
| **3. 100% Locally Derived Funding (cont'd.)** | | | | | | | |
| 160th Ave. | | Lowell Blvd. to Sheridan Pkwy. | New 2 Lanes | 1.0 | 2015-2024 | $3.8 | Broomfield |
| Alameda Ave. | | McIntyre St. to Rooney Rd. | Widen from 2 to 6 Lanes | 0.3 | 2015-2024 | $2.6 | Jefferson |
| Alameda Ave. | | Bear Creek Blvd. to McIntyre St. | Widen from 2 to 4 Lanes | 1.3 | 2015-2024 | $7.6 | Jefferson |
| Arapahoe Rd. | | Himalaya Way to Liverpool St. | Widen from 4 to 6 Lanes | 0.5 | 2025-2034 | $6.2 | Arapahoe |
| Arapahoe Rd. | | Waco St. to Himalaya St. | Widen from 2 to 6 Lanes | 1.3 | 2015-2024 | $20.4 | Arapahoe |
| Bayou Gulch Rd. /Chambers Rd. | | Parker Road to Parker S. Town Limit | Widen from 0/2 to 4 Lanes | 2.4 | 2025-2034 | $18.4 | Douglas |
| Broadway | | Arizona Ave. to Mississippi Ave. | Widen from 4 to 6 Lanes | 0.1 | 2015-2024 | $2.5 | Denver |
| Broadway | | Kentucky Ave. to Exposition Ave. | Widen from 4 to 6 Lanes | 0.3 | 2015-2024 | $4.8 | Denver |
| Broadway | | Mississippi Ave. to Kentucky Ave. | Widen from 6 to 8 Lanes | 0.3 | 2015-2024 | $5.0 | Denver |
| Broncos Pkwy. | | Jordan Rd. to Parker Rd. | Widen from 4 to 6 Lanes | 0.8 | 2015-2024 | $6.9 | Arapahoe |
| Broncos Pkwy. | | Havana St. to Peoria St. | Widen from 4 to 6 Lanes | 1.0 | 2015-2024 | $8.1 | Arapahoe |
| Buckley Rd. | | 118th Ave. to Cameron Dr. | Widen from 2 to 6 Lanes | 1.3 | 2015-2024 | $13.9 | Adams |
| Buckley Rd. | | 136th Ave. to Bromley Ln. | Widen from 2 to 4 Lanes | 2.0 | 2015-2024 | $7.8 | Adams |
| C-470 | C-470 | S. Kipling Pkwy. to I-25 | Add New Toll/Managed Lanes | | | | |
| | | *WB: Wadsworth Blvd. to S. Kipling Pkwy.* | *Add 1 Toll/Managed Lane* | *1.4* | *2025-2034* | *$45.0* | *Jefferson* |
| | | *EB: S. Kipling Pkwy. to Wadsworth Blvd.* | *Add 1 Toll/Managed Lane* | *3.0* | *2025-2034* | | *Jefferson* |
| | | *WB: Colorado Blvd. to Lucent Blvd.* | *Add 1 Toll/Managed Lane* | *3.7* | *2025-2034* | *$120.0* | *Douglas* |
| | | *EB: Broadway to I-25* | *Add 1 Toll/Managed Lane* | *6.6* | *2025-2034* | | *Douglas* |
| Canyons Pkwy. | | Crowfoot Valley Rd. to Hess Rd. | New 4 Lanes | 4.1 | 2015-2024 | $19.1 | Douglas |
| Central Park Blvd. | | 47th Ave. (Northfield Blvd.) to 56th Ave. | New 4 Lanes | 0.9 | 2015-2024 | $4.3 | Denver |
| Chambers Rd. | | Crowfoot Valley Road to Parker S. Town Limit | New 2 Lanes | 0.7 | 2025-2034 | $3.1 | Douglas |
| Chambers Rd. | | Crowfoot Valley Road to Parker S. Town Limit | Widen from 2 to 4 Lanes | 0.7 | 2015-2024 | $3.1 | Douglas |
| Chambers Rd. | | Crowfoot Valley Rd. to Hess Rd. | New 4 Lanes | 2.3 | 2015-2024 | $15.4 | Douglas |
| Chambers Rd. | | Hess Rd. to Mainstreet | Widen from 2 to 4 Lanes | 1.9 | 2015-2024 | $12.6 | Douglas |
| Chambers Rd. | | Mainstreet to Lincoln Ave. | Widen from 2 to 4 Lanes | 1.4 | 2015-2024 | $4.4 | Douglas |
| Colorado Blvd. | | 144th Ave. to 168th Ave. | Widen from 0/2 to 4 Lanes | 3.7 | 2025-2034 | $23.5 | Adams |
| Crowfoot Valley Rd. | | Stroh Rd. to Chambers Rd. | Widen from 2 to 4 Lanes | 1.4 | 2015-2024 | $6.4 | Douglas |
| Crowfoot Valley Rd. | | Macanta Rd. to Chambers Rd. | Widen from 2 to 4 Lanes | 3.6 | 2025-2034 | $22.9 | Douglas |
| Crowfoot Valley Rd. | | Founders Pkwy. to Macanta Rd. | Widen from 2 to 4 Lanes | 1.1 | 2025-2034 | $5.1 | Douglas |
| E. Bromley Ln. | | Hwy 85 to Sable Blvd. | Widen from 4 to 6 Lanes | 0.5 | 2015-2024 | $1.3 | Adams |
| E. Bromley Ln. | | Tower Rd. to I-76 | Widen from 4 to 6 Lanes | 1.1 | 2015-2024 | $1.9 | Adams |
| E-470 | | 48th Ave. | Add New Interchange | | 2015-2024 | $26.9 | Adams |
| E-470 | | 88th Ave. | Add New Interchange | | 2025-2034 | $17.6 | Adams |
| E-470 | | I-25 North to I-76 | Widen from 4 to 6 Lanes | 11.0 | 2025-2034 | $100.0 | Adams |
| E-470 | | Potomac | Add New Interchange | | 2015-2024 | $15.0 | Adams |
| E-470 | | 112th Ave. | Add New Interchange | | 2025-2034 | $17.6 | Adams |
| E-470 | | I-70 to Pena Blvd. | Widen from 4 to 6 Lanes | 7.4 | 2025-2034 | $29.3 | Adams/Denver |
| E-470 | | Pena Blvd. to I-76 | Widen from 4 to 6 Lanes | 7.6 | 2025-2034 | $60.0 | Adams/Denver |
| E-470 | | I-25 to Parker Rd. | Widen from 6 to 8 Lanes | 5.5 | 2025-2034 | $45.0 | Arapahoe |
| E-470 | | Parker Rd. to Quincy Ave. | Widen from 4 to 6 Lanes | 8.1 | 2015-2024 | $80.0 | Arapahoe/Douglas |
| E-470 | | Quincy Ave. to I-70 | Widen from 4 to 6 Lanes | 7.0 | 2025-2034 | $60.0 | Arapahoe |
| East County Line Rd. | | 9th Ave. to SH-66 | Widen from 2 to 4 Lanes | 2.0 | 2025-2034 | $9.8 | Boulder |
| Erie Pkwy. | | US-287 to 119th St. | Widen from 2 to 4 Lanes | 1.5 | 2015-2024 | $14.6 | Boulder |
| Green Valley Ranch Blvd. | | Chambers Rd. to Telluride St. | Widen from 4 to 6 Lanes | 1.5 | 2015-2024 | $9.9 | Denver |
| Green Valley Ranch Blvd. | | Chambers Rd. to Pena Blvd. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $2.4 | Denver |
| Green Valley Ranch Blvd. | | Telluride St. to Tower Rd. | Widen from 4 to 6 Lanes | 0.5 | 2015-2024 | $1.7 | Denver |
| Gun Club Rd. | | 1.5 Miles s/of Quincy Ave. to Quincy Ave. | Widen from 2 to 6 Lanes | 1.6 | 2015-2024 | $26.7 | Arapahoe |
| Gun Club Rd. | SH-30 | Yale Ave. to Mississippi Ave. | Widen from 2/4 to 6 Lanes | 2.1 | 2025-2034 | $10.9 | Arapahoe |
| Hampden Ave. | | Picadilly Rd. to Gun Club Rd. | Widen from 2 to 4 Lanes | 1.1 | 2015-2024 | $12.4 | Arapahoe |
| Harvest Mile Rd. | | 56th Ave. to 64th Ave. | New 3 Lanes | 1.0 | 2015-2024 | $6.5 | Adams |
| Harvest Mile Rd. | | 56th Ave. to 64th Ave. | Widen from 3 to 6 Lanes | 1.0 | 2025-2034 | $7.8 | Adams |
| Harvest Mile Rd. | | I-70 to 56th Ave. | New 6 Lanes | 4.1 | 2015-2024 | $54.3 | Adams |
| Harvest Mile Rd. | | Jewell Ave. to Mississippi Ave. | Widen from 2 to 6 Lanes | 1.0 | 2025-2034 | $13.3 | Arapahoe |
| Harvest Rd. | | 6th Ave. to I-70 | New 6 Lanes | 1.1 | 2015-2024 | $13.3 | Adams |
| Harvest Rd. | | Alameda Ave. to 6th Ave. | Widen from 3 to 6 Lanes | 1.0 | 2015-2024 | $6.7 | Arapahoe |

## Appendix 4 - 2040 Metro Vision Regional Transportation Plan
## Fiscally Constrained Roadway & Rapid Transit Capacity Improvements
### Remaining Project Cost Allocations (FY 2016 - 2040)
*February 2017*

| Roadway | CDOT Road | Project Location (Limits) | Improvement Type | Length (Miles) | Network Staging Period | Remaining Project Cost (FY '15 $millions) | County |
|---|---|---|---|---|---|---|---|
| **3. 100% Locally Derived Funding (cont'd.)** | | | | | | | |
| Harvest Rd. | | Mississippi Ave. to Alameda Ave. | New 6 Lanes | 1.0 | 2015-2024 | $13.3 | Arapahoe |
| Hess Rd. | | I-25 to Chambers Rd. | Widen from 2 to 4 Lanes | 5.1 | 2025-2034 | $44.5 | Douglas |
| Hilltop Rd. | | Canterberry Pkwy. to Singing Hills Rd. | Widen from 2 to 4 Lanes | 2.7 | 2025-2034 | $17.8 | Douglas |
| Huron St. | | 150th Ave. to 160th Ave. | Widen from 2 to 4 Lanes | 1.3 | 2015-2024 | $8.6 | Broomfield |
| Huron St. | | 160th Ave. to SH-7 | Widen from 2 to 4 Lanes | 1.2 | 2015-2024 | $5.1 | Broomfield |
| I-25 | I-25 | Castlegate Dr. | Add New Interchange | | 2015-2024 | $15.3 | Douglas |
| I-25 | I-25 | Crystal Valley Pkwy. | Add New Interchange | | 2025-2034 | $44.5 | Douglas |
| I-70 | I-70 | E-470 | Interchange Capacity | | 2025-2034 | $100.0 | Adams/Arapahoe |
| I-70 | I-70 | Harvest Mile Rd. | Add New Interchange | | 2015-2024 | $39.6 | Adams/Arapahoe |
| I-70 | I-70 | 32nd Ave. | Interchange Capacity | | 2015-2024 | $22.4 | Jefferson |
| I-70 | I-70 | Picadilly Rd. | Add New Interchange | | 2015-2024 | $27.5 | Adams |
| I-76 | I-76 | Bridge St. | Add New Interchange | | 2015-2024 | $25.4 | Adams |
| Imboden Rd. | | 48th Ave. to 56th Ave. | Widen from 2 to 6 Lanes | 1.0 | 2025-2034 | $10.3 | Adams |
| Jefferson Pkwy. | | Initial Phase: SH-93 to SH-128 | New 4 Lane Toll Road; 3 Partial Interchanges | 10.2 | 2015-2024 | $259.1 | Jefferson |
| | | *Candelas Pkwy.* | *New Partial Interchange* | | *2015-2024* | | |
| | | *Indiana St. s/o SH-128* | *New Partial Interchange* | | *2015-2024* | | |
| | | *SH-72* | *New Partial Interchange* | | *2015-2024* | | |
| Jewell Ave. | | E-470 to Gun Club Rd. | Widen from 2 to 6 Lanes | 0.5 | 2015-2024 | $4.9 | Arapahoe |
| Jewell Ave. | | Gun Club Rd. to Harvest Rd. | Widen from 2 to 6 Lanes | 1.0 | 2015-2024 | $10.0 | Arapahoe |
| Jewell Ave. | | Himalaya Rd. to E-470 | Widen from 3 to 6 Lanes | 1.4 | 2015-2024 | $13.2 | Arapahoe |
| Jordan Rd. | | Bradbury Pkwy. to Hess Rd. | Widen from 2 to 4 Lanes | 0.6 | 2015-2024 | $3.0 | Douglas |
| Lincoln Ave. | | First St. to Keystone Blvd. | Widen from 4 to 6 Lanes | 1.8 | 2025-2034 | $8.3 | Douglas |
| Lincoln Ave. | | Keystone Blvd. to Parker Rd. | Widen from 4 to 6 Lanes | 1.6 | 2015-2024 | $8.0 | Douglas |
| Lincoln Ave. | | Peoria St. to First St. | Widen from 4 to 6 Lanes | 0.7 | 2015-2024 | $3.2 | Douglas |
| Mainstreet | | Canterberry Pkwy. to Tomahawk Rd. | Widen from 2 to 4 Lanes | 1.4 | 2025-2034 | $7.6 | Douglas |
| Mainstreet | | Lone Tree E. City Limit to Chambers Rd. | Widen from 2 to 4 Lanes | 0.9 | 2025-2034 | $7.6 | Douglas |
| McIntyre St. | | 44th Ave. to 52nd Ave. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $3.5 | Jefferson |
| McIntyre St. | | 52nd Ave. to 60th Ave. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $6.5 | Jefferson |
| Monaghan Rd. | | Quincy Ave. to Yale Ave. | New 6 Lanes | 2.0 | 2025-2034 | $22.9 | Arapahoe |
| Nelson Rd. | | 75th St. to Affolter Dr. | Widen from 2 to 4 Lanes | 2.3 | 2015-2024 | $5.2 | Boulder |
| Pace St. | | 5th Ave. to Ute Rd. | Widen from 2 to 4 Lanes | 2.5 | 2015-2024 | $3.8 | Boulder |
| Pecos St. | | 52nd Ave. to I-76 | Widen from 2 to 4 Lanes | 1.3 | 2015-2024 | $8.7 | Adams |
| Pena Blvd. | | Tower Rd. | Add on-ramp to WB Pena | | 2015-2024 | $3.8 | Denver |
| Pena Blvd. | | Jackson Gap St. West Ramps to DIA Terminal | Widen from 6 to 8 Lanes | 1.7 | 2015-2024 | $10.2 | Denver |
| Peoria St. | | E-470 to .75 miles s/o Lincoln Ave. | Widen from 2 to 4 Lanes | 1.9 | 2015-2024 | $4.4 | Douglas |
| Peoria St. | | .75 miles s/o Lincoln Ave. to Mainstreet | Widen from 2 to 4 Lanes | 0.5 | 2025-2034 | $4.4 | Douglas |
| Picadilly Rd. | | 48th Ave. to 56th Ave. | Widen from 2 to 6 Lanes | 1.2 | 2015-2024 | $13.6 | Adams |
| Picadilly Rd. | | 56th Ave. to 70th Ave./Aurora City Limits | New 6 Lanes | 1.7 | 2015-2024 | $20.4 | Adams |
| Picadilly Rd. | | 82nd Ave. to 96th Ave. | New 6 Lanes | 1.8 | 2025-2034 | $21.6 | Adams |
| Picadilly Rd. | | Colfax Ave. to I-70 | New 6 Lanes | 0.3 | 2015-2024 | $12.9 | Adams |
| Picadilly Rd. | | I-70 to Smith Rd. | Widen from 2 to 6 Lanes | 0.5 | 2015-2024 | $5.3 | Adams |
| Picadilly Rd. | | Smith Rd. to 48th Ave. | Widen from 2 to 6 Lanes | 2.2 | 2015-2024 | $22.5 | Adams |
| Picadilly Rd. | | 96th Ave. to 120th Ave. | New 6 Lanes | 3.0 | 2025-2034 | $49.0 | Adams |
| Picadilly Rd. | | 6th Ave. to Colfax Ave. | Widen from 2 to 6 Lanes | 1.6 | 2015-2024 | $10.0 | Arapahoe |
| Picadilly Rd. | | Jewell Ave. to 6th Pkwy. | New 4 Lanes | 2.7 | 2015-2024 | $18.1 | Arapahoe |
| Picadilly Rd. | | 70th Ave. to 82nd Ave. | New 6 Lanes | 1.5 | 2015-2024 | $11.4 | Denver |
| Plum Creek Pkwy. | | Gilbert St. to Ridge Rd. | Widen from 2 to 4 Lanes | 1.5 | 2015-2024 | $5.1 | Douglas |
| Powhaton Rd. | | Smoky Hill Rd. to County Line Rd. | Widen from 2 to 6 Lanes | 1.0 | 2025-2034 | $3.5 | Arapahoe |
| Quail Run Rd. | | I-70 to 48th Ave. | New 6 Lanes | 3.0 | 2025-2034 | $36.4 | Adams |
| Quebec St. | | 120th Ave. to 128th Ave. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $8.4 | Adams |
| Quebec St. | | 132nd Ave. to 160th Ave. | Widen from 2 to 4 Lanes | 3.5 | 2015-2024 | $21.0 | Adams |
| Quincy Ave. | | Plains Pkwy. to Gun Club Rd. | Widen from 2 to 6 Lanes | 0.6 | 2015-2024 | $13.3 | Arapahoe |
| Quincy Ave. | | Hayesmount Rd. to Watkins Rd. | Widen from 2 to 6 Lanes | 2.0 | 2025-2034 | $16.0 | Arapahoe |
| Quincy Ave. | | Monaghan Rd. to Hayesmount Rd. | Widen from 2 to 6 Lanes | 1.1 | 2025-2034 | $18.9 | Arapahoe |
| Quincy Ave. | | C-470 to Simms St. | Widen from 2 to 4 Lanes | 1.9 | 2015-2024 | $8.0 | Jefferson |
| Quincy Ave. | | Simms St. to Kipling Pkwy. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $12.0 | Jefferson |

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*February 2017*

| Roadway | CDOT Road | Project Location (Limits) | Improvement Type | Length (Miles) | Network Staging Period | Remaining Project Cost (FY '15 $millions) | County |
|---|---|---|---|---|---|---|---|
| **3. 100% Locally Derived Funding (cont'd.)** | | | | | | | |
| Quincy Ave. | | Irving St. to Federal Blvd. | New 2 Lanes | 0.3 | 2015-2024 | $3.8 | Arapahoe |
| Rampart Range Rd. | | Waterton Rd. to Titan Rd. | Widen from 2 to 4 Lanes | 1.5 | 2025-2034 | $10.2 | Douglas |
| Ridge Rd. | | Plum Creek Pkwy. to SH-86 | Widen from 2 to 4 Lanes | 1.1 | 2015-2024 | $3.8 | Douglas |
| S. Boulder Rd./160th Ave. | | 120th St. to Boulder/Broomfield County Line | New 2 Lanes | 1.2 | 2025-2034 | $10.2 | Boulder |
| SH-2 | SH-2 | 72nd Ave. to I-76 | Widen from 2 to 4 Lanes | 7.5 | 2015-2024 | $21.7 | Adams |
| SH-7 | SH-7 | Riverdale Rd. to US-85 | Widen from 2 to 4 Lanes | 1.1 | 2025-2034 | $16.3 | Adams |
| SH-7 | SH-7 | Boulder County Line to Sheridan Pkwy. | Widen from 2 to 4 Lanes | 2.5 | 2015-2024 | $6.6 | Broomfield |
| SH-7 | SH-7 | Sheridan Pkwy. to I-25 | Widen from 2 to 6 Lanes | 1.5 | 2015-2024 | $10.2 | Broomfield |
| SH-7 | SH-7 | York St. to Big Dry Creek | Widen from 2 to 4 Lanes | 0.7 | 2015-2024 | $8.0 | Adams |
| SH-58 | SH-58 | Cabela St. | Add New Interchange | | 2015-2024 | $19.6 | Jefferson |
| Sheridan Blvd. | | Lowell Blvd. to NW Pkwy. | Widen from 2 to 4 Lanes | 1.1 | 2015-2024 | $7.6 | Broomfield |
| Sheridan Pkwy. | | NW Pkwy. to SH-7 | Widen from 2 to 4 Lanes | 1.3 | 2015-2024 | $5.7 | Broomfield |
| Smoky Hill Rd. | | Pheasant Run Pkwy. to Versailles Pkwy. | Widen from 4 to 6 Lanes | 4.4 | 2025-2034 | $33.9 | Arapahoe |
| Southwest Ring Rd. | | Wolfensberger Rd. to I-25 | Widen from 2 to 4 Lanes | 1.4 | 2015-2024 | $5.1 | Douglas |
| Stroh Rd. | | Crowfoot Valley Rd. to J Morgan Blvd. | Widen from 2 to 4 Lanes | 0.5 | 2015-2024 | $6.4 | Douglas |
| Stroh Rd. | | Chambers Rd. to Crowfoot Valley Rd. | New 4 Lanes | 1.4 | 2015-2024 | $10.6 | Douglas |
| Thornton Pkwy. | | Colorado Blvd. to Riverdale Rd. | Widen from 2 to 4 Lanes | 0.5 | 2025-2034 | $14.0 | Adams |
| Titan Rd. | | Rampart Range Rd. to Santa Fe Dr. | Widen from 2 to 4 Lanes | 3.0 | 2025-2034 | $38.1 | Douglas |
| Tower Rd. | | Colfax Ave. to Smith Rd. | Widen from 2 to 6 Lanes | 1.0 | 2015-2024 | $8.7 | Adams |
| Tower Rd. | | Pena Blvd. to 104th Ave. | Widen from 2 to 6 Lanes | 3.8 | 2015-2024 | $40.5 | Adams |
| Tower Rd. | | Pena Blvd. to 104th Ave. | Widen from 4 to 6 Lanes | 3.8 | 2025-2034 | $20.0 | Adams |
| Tower Rd. | | 6th Ave. to Colfax Ave. | New 2 Lanes | 1.0 | 2015-2024 | $9.5 | Arapahoe |
| Tower Rd. | | 6th Ave. to Colfax Ave. | Widen from 2 to 6 Lanes | 1.0 | 2025-2034 | $16.3 | Arapahoe |
| Tower Rd. | | 38th/40th Ave. to Green Valley Ranch Blvd. | Widen from 2/4 to 6 Lanes | 1.0 | 2015-2024 | $26.7 | Denver |
| Tower Rd. | | 56th Ave. to Pena Blvd. | Widen from 4 to 6 Lanes | 2.4 | 2015-2024 | $16.0 | Denver |
| Tower Rd. | | 48th Ave. to 56th Ave. | Widen from 4 to 6 Lanes | 1.0 | 2015-2024 | $5.3 | Denver |
| Tower/Buckley Rd. | | 105th Ave. to 118th Ave. | New 4 Lanes | 2.0 | 2015-2024 | $8.8 | Adams |
| US-85 | US-85 | Titan Rd. to Highland Ranch Pkwy. | Widen from 4 to 6 Lanes | 2.2 | 2025-2034 | $5.9 | Douglas |
| US-85 | US-85 | Castlegate Dr. | Add New Interchange | | 2015-2024 | $31.8 | Douglas |
| Washington St. | | Elk Pl. to 52nd Ave. | Widen from 2 to 4 Lanes | 0.6 | 2015-2024 | $13.3 | Denver |
| Washington St. | | 52nd Ave. to 58th Ave. | Widen from 2 to 4 Lanes | 0.8 | 2015-2024 | $4.4 | Adams |
| Washington St. | | 144th Ave. to 152nd Ave. | Widen from 2 to 6 Lanes | 0.7 | 2015-2024 | $28.9 | Adams |
| Washington St. | | 152nd Ave. to 160th Ave. | Widen from 2 to 6 Lanes | 1.4 | 2015-2024 | $37.3 | Adams |
| Waterton Rd. | | Dante Dr. to Campfire St. | Widen from 2 to 4 Lanes | 1.0 | 2025-2034 | $3.8 | Douglas |
| Watkins Rd. | | Quincy Ave. to I-70 | Widen from 2 to 6 Lanes | 7.1 | 2025-2034 | $54.7 | Arapahoe |
| Wolfensberger Rd. | | Coachline Rd. to Prairie Hawk Dr. | Widen from 2 to 4 Lanes | 1.0 | 2025-2034 | $7.5 | Douglas |
| Yale Ave. | | Monaghan Rd. to Hayesmount Rd. | Widen from 2 to 6 Lanes | 1.1 | 2025-2034 | $17.3 | Arapahoe |
| York St. | | 152nd Ave. to E-470 | Widen from 2 to 4 Lanes | 0.2 | 2025-2034 | $2.0 | Adams |
| York St. | | 160th Ave. (SH-7) to 168th Ave. | Widen from 2 to 4 Lanes | 1.0 | 2015-2024 | $7.5 | Adams |
| York St. | | E-470 to SH-7 | Widen from 2 to 4 Lanes | 0.7 | 2015-2024 | $10.7 | Adams |
| | | | | | **A.3. Subtotal:** | **$3,353.7** | |
| | | | **Grand Total for Regional Roadway System Projects:** | | | **$6,325.3** | |

## B. Regional Transit Projects

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **FasTracks Components** | | | | | | | |
| Eagle Project | | | | | | $1,033.2 | |
| East Rail Line | | DUS to DIA | Commuter Rail | 22.8 | 2015-2024 | | Adams/Denver |
| Gold Line | | DUS to Ward Rd. | Commuter Rail | 11.2 | 2015-2024 | | Multiple |
| Northwest Rail Phase 1 | | DUS to 71st/Lowell Blvd. | Commuter Rail | 6.2 | 2015-2024 | | Adams/Denver |
| I-225 Rail Line | | Parker Rd. to East Rail Line | Light Rail | 10.5 | 2015-2024 | $476.9 | Adams/Arapahoe |
| North Metro Commuter Rail | | DUS to 124th Ave. | Commuter Rail | 13.0 | 2015-2024 | $606.8 | Adams/Denver |
| Southeast Rail Extension | | Lincoln Ave. to Ridgegate Pkwy. | Light Rail | 2.3 | 2015-2024 | $205.9 | Douglas |
| US-36 Bus Rapid Transit | | DUS to Table Mesa | Bus Rapid Transit | 18.0 | 2015-2024 | $78.9 | Multiple |
| Other FasTracks Projects | | | | | | $99.4 | |
| **Other Regional Transit** | | | | | | | |
| Colfax Ave. | US-40 | 7th St. to Potomac St. | Bus Rapid Transit | 10.5 | 2015-2024 | $115.0 | Adams/Denver |
| SH-119 | SH-119 | Foothills Pkwy to US-287 | Bus Rapid Transit | 11.0 | 2015-2024 | $57.0 | Boulder |
| | | | | | **Total of Regional Transit Projects** | **$2,673.1** | |

# APPENDIX 5

## 2040 MVRTP Freight and Goods Movement Component

# APPENDIX 5. FREIGHT AND GOODS MOVEMENT COMPONENT

January 2017

## A. Introduction

The economy of Colorado and the Denver region depends on the efficient movement of freight, goods, and packages into, out of and through the region. 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 to and pickups 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."*

## B. Freight Background

Freight represents any physical goods, parcels, raw materials or finished products that are transported from one place to another. The Metro Vision Regional Transportation Plan (MVRTP) focuses on surface freight transportation modes and facilities—highways, streets, rail and multimodal terminals. (The aviation section of the MVRTP addresses issues related to freight delivery by air.) Examples of freight movement 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");
- 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.

Denver is the northern end of the Ports-to-Plains corridor connecting Colorado to Mexico via Laredo, Texas. Its location could result in an increased role for the Denver region as a distribution center and freight consolidation point for goods shipped to and from Mexico via I-70, U.S. 40 and U.S. 287.

## C. Federal Freight Requirements and Guidance

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

- Establishing a National Multimodal Freight Policy that includes national goals to guide decision-making, and creates the National Multimodal Freight Network, 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 and a National Highway Freight Program, and providing $6.3 billion in formula funds over five years for states to invest in freight projects on the National Highway Freight Network.
- Requiring states to develop freight plans to be eligible to receive funding under the National Highway Freight Program.
- Requiring the development of a National Freight Strategic Plan 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 a National Multimodal Freight Policy of maintaining and improving the condition and performance of the National Multimodal Freight Network. It specifies goals associated with this national policy related to the condition, safety, security, efficiency, productivity, resiliency and reliability of the network, and to reduce the adverse environmental effects of freight movement on the network. Federal statutes state that these goals are to be pursued in a manner that is not burdensome to state and local governments. Specifically, the network is used:

- To assist states in strategically directing resources toward improved system performance for the efficient movement of freight on the National Multimodal Freight Network;
- To inform freight transportation planning;

- To assist in the prioritization of federal investment; and
- To assess and support federal investments to achieve national multimodal freight policy goals, and national highway freight program goals.

Projects on the National Multimodal Freight Network are eligible to receive discretionary grants focused on freight in which states, metropolitan planning organizations, 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 will address the conditions and performance of the multimodal freight system, identify strategies and best practices to improve intermodal connectivity and the performance of the national freight system, and mitigate the effects 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 promoting best contracting practices and innovative financing and funding opportunities, and reducing uncertainty and delays with respect to environmental reviews and permitting.

To receive funding under the ($6.3 billion over five years for projects on the National Highway Freight Network), 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;
- 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 Moving Ahead for Progress in the 21st Century (MAP-21) requirement for DRCOG, in coordination with the Colorado Department of Transportation (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) 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.
- 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:

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

## D. Current Freight Planning Efforts and Stakeholder Input

DRCOG, CDOT, and key freight stakeholders 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 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 Metropolitan Planning Agencies (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 in 2015, with DRCOG hosting the kickoff meeting and participating on an ongoing basis. 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 State Highway Freight Plan compliant with MAP-21 was the first phase completed in 2014. 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 Investment and Improvement 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 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 rail system improvement needs were also identified in the plan.

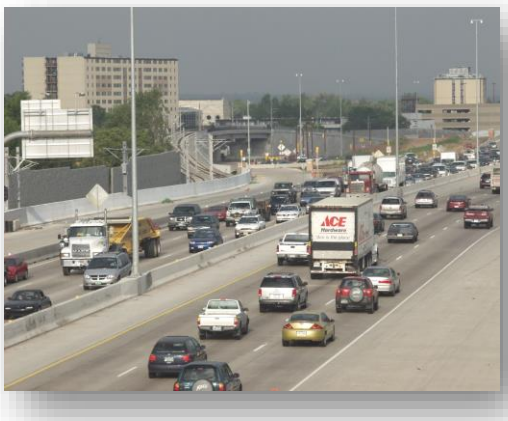
### Freight Stakeholder Input

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)

### 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
- One effect of increased roadway congestion may be more truck traffic on the roads during peak periods. 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.

- Rail freight traffic through the Front Range metropolitan areas is slow and there are safety issues at rail-highway crossings.
- Many of the older roadways present problems for 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 radii on the surface streets were tighter for smaller trucks or reduced as lanes were added within existing rights-of-way. Many long-haul operations now use two (tandem) or even three (triple) trailer combinations. The turning movements of these longer trailer combinations take more space than was designed into many existing roads.
- Many bridges cannot handle the larger freight loads. Bridges with weight limits force trucks to take detours, 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 to accommodate the need for more capacity.
- The increase in truck traffic has overloaded rest area spaces for parking trucks while en 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 effects 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 results in more trucks on the road with partial loads.
- Shortages of qualified commercial vehicle drivers in the labor force.
- Poor roadway conditions, such as pavement, markings, crumbling pavement and generally aging infrastructure.
- 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 Telephone Town Halls, as well as Transportation Planning Region meetings, included:

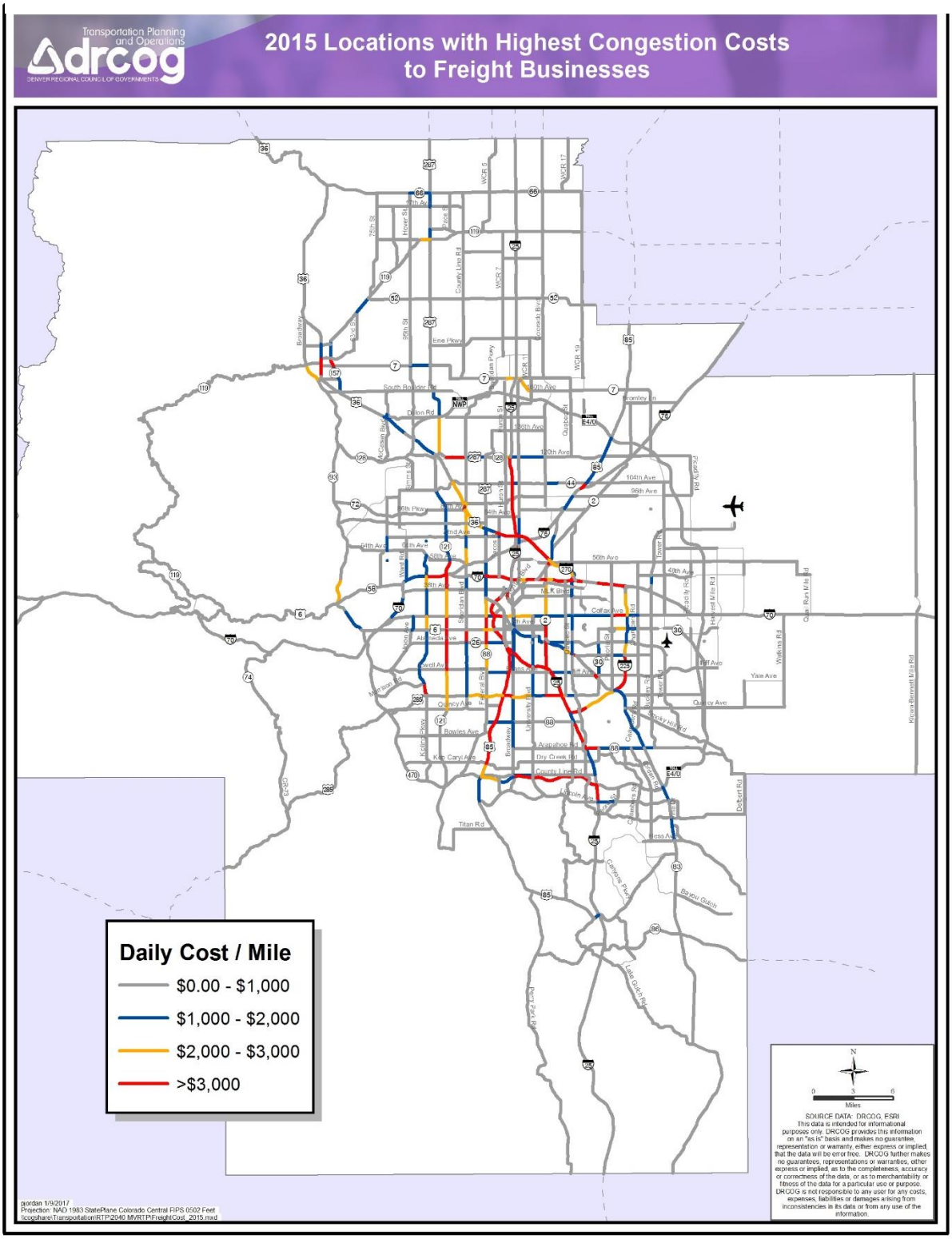
- more work is needed at the regional level to identify freight bottlenecks, factors hindering freight movement and the importance of freight corridors to the entire state;
- multistate freight corridors are important to the state and regional economies and should be prioritized for improvements;
- reliability of freight movement enables many regional businesses to compete in global markets;
- many planned highway improvements will benefit the movement of truck freight;
- air freight is vital to regional businesses to bring in shipments of important goods and enable client and employee travel;
- transportation planning regions and MPOs could facilitate the creation of more or improved freight multimodal transfer points (train/truck, truck/train, and truck/plane);
- truck freight is sensitive to consumer demand and economic activities; and
- mitigation of the effects 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.

## Other Activities

DRCOG also addresses freight in its Congestion Mitigation Program. 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 2015 data, identifies

the locations with the highest congestion costs to freight and businesses. In total, the cost of congestion delay is more than $1 million a day to commercial vehicles and businesses in the DRCOG region.

**Figure 1: Locations with Highest Congestion Costs to Freight Businesses**



## E. Freight Network and 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. Every street is part of the freight network, facilitating long-haul trucking on interstate highways to residential deliveries on local streets.

The FAST Act establishes a National Multimodal Freight Network 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 National Multimodal Freight Network.

In Colorado, the interim National Multimodal Freight Network includes the National Highway Freight Network in Colorado. This includes the interstates, small segments of E-470, U.S. 6, U.S. 85, and SH 2 in the metro Denver area and eight intermodal connectors in the metro Denver area, all Class I railroads and Denver International Airport. The final National Multimodal Freight Network 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 the U.S. Department of Transportation 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 National Highway Freight Network to strategically direct federal resources and policies toward improved performance of highway portions of the U.S. freight transportation system.

The National Highway Freight Network includes the following subsystems of roadways:

- **Primary Highway Freight System:** 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 Primary Highway Freight System:** Highways consisting of the remaining portion of interstate roads are not included in the Primary Highway Freight System. These routes provide continuity and access to freight transportation facilities. These portions amount to an estimated 9,511 centerline miles of Interstate, nationwide and will fluctuate with additions to and deletions from the Interstate Highway System.

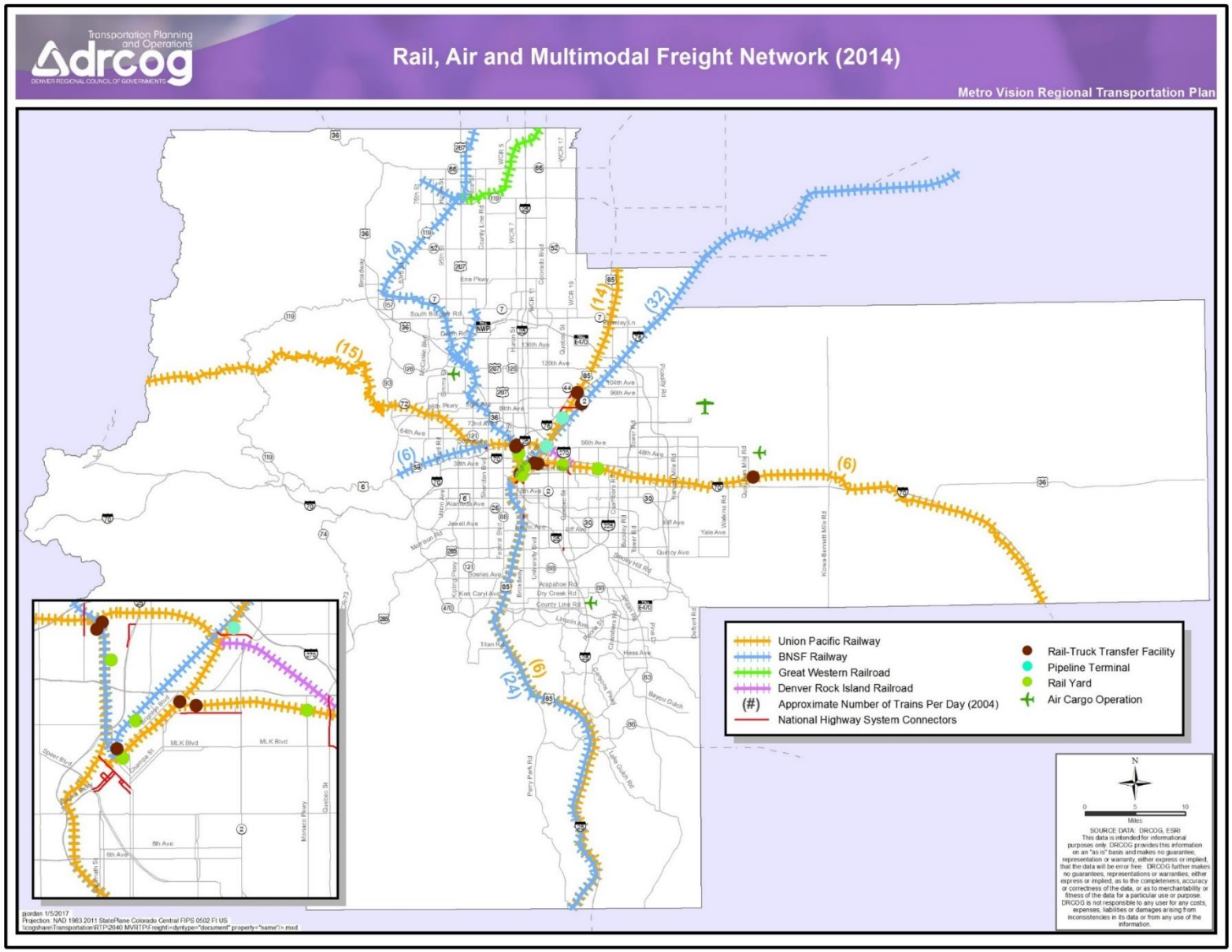
- **Critical Rural Freight Corridor:** Public roads outside of urbanized areas which provide access and connections to the Primary Highway Freight System and the interstate system with other ports, public transportation facilities or other intermodal freight facilities.

- **Critical Urban Freight Corridors:** These are public roads in urbanized areas which provide access and connection to the Primary Highway Freight System and the Interstate with other ports, public transportation facilities, or other intermodal transportation facilities.

Prior to designation of Critical Rural Freight Corridors and Critical Urban Freight Corridors, the National Highway Freight Network consists of the Primary Highway Freight System and other interstate portions not on the Primary Highway Freight System, 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 Critical Rural Freight Corridors and Critical Urban Freight Corridors in accordance with the FAST Act. State designation of the Crtical Rural Freight Corridors is limited to a maximum of 150 miles of highway or 20 percent of the Primary Highway Freight System mileage in the state, whichever is greater. State and MPO designation of the Critical Uruban Freight Corridor 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 Critical Rural Freight Corridors and 80.35 centerline miles statewide for Critical Urban Freight Corridors (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.

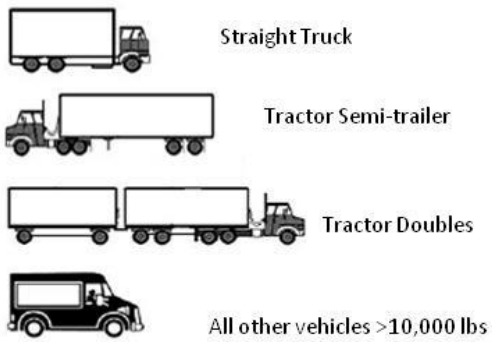
CDOT's 2015 State Highway Freight Plan also designates specific freight corridors based on a range of criteria, including truck traffic, connectivity, federal requirements and stakeholder input. In the DRCOG region, CDOT's freight corridors include interstate highways, freeways and a few major regional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

**Figure 2: Rail, Air and Multimodal Freight Network (2014)**



## 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 F-350 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 in Figure 8 and provide connections to major multimodal terminals such as airports, rail terminals, truck terminals, pipeline terminals, park and ride lots, bus terminals and bus stations.

Regulatory and other issues facing truck movements include the following

- CDOT regulations and rules for longer combination vehicles, 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, including—criminal background checks, facility security plans, and 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, or the maximum length of a work shift, and CDOT road closures. For example, if CDOT has a winter 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 and is one illustration of the interconnectedness of the various facets of freight movement.

## Commercial Vehicle Volumes

Figures 3 and 4 show 2015 and 2040 forecasted commercial vehicle volumes on the region's major roadways and highways. These data are from DRCOG's 2015 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 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 close to each other and were routed through a carrier facility in Hodgkins, Illinois (suburban Chicago), and then were likely shipped by truck to a distribution center in Commerce City, Colorado, based on the 1.5 days of transit time. Both packages were then sorted and routed early the next morning for delivery later that day. This example illustrates the logistical complexities of goods movement and the importance of reliable travel and delivery times.

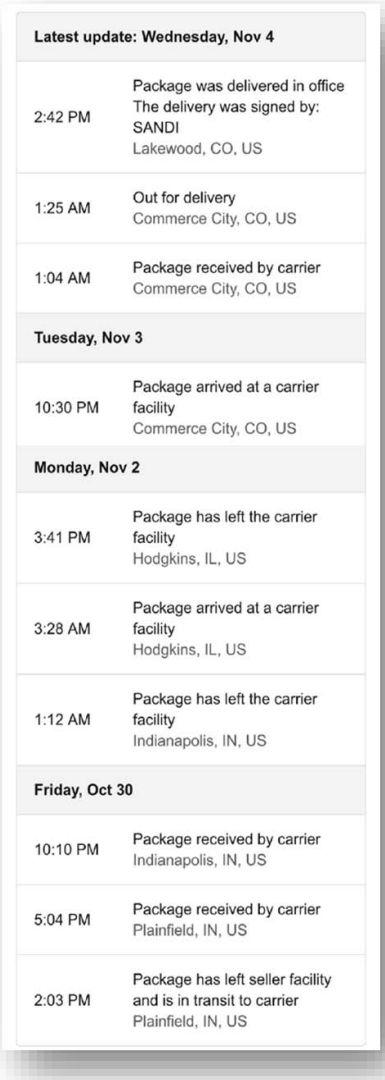


**Figure 3: 2015 Commercial Vehicle Volumes**

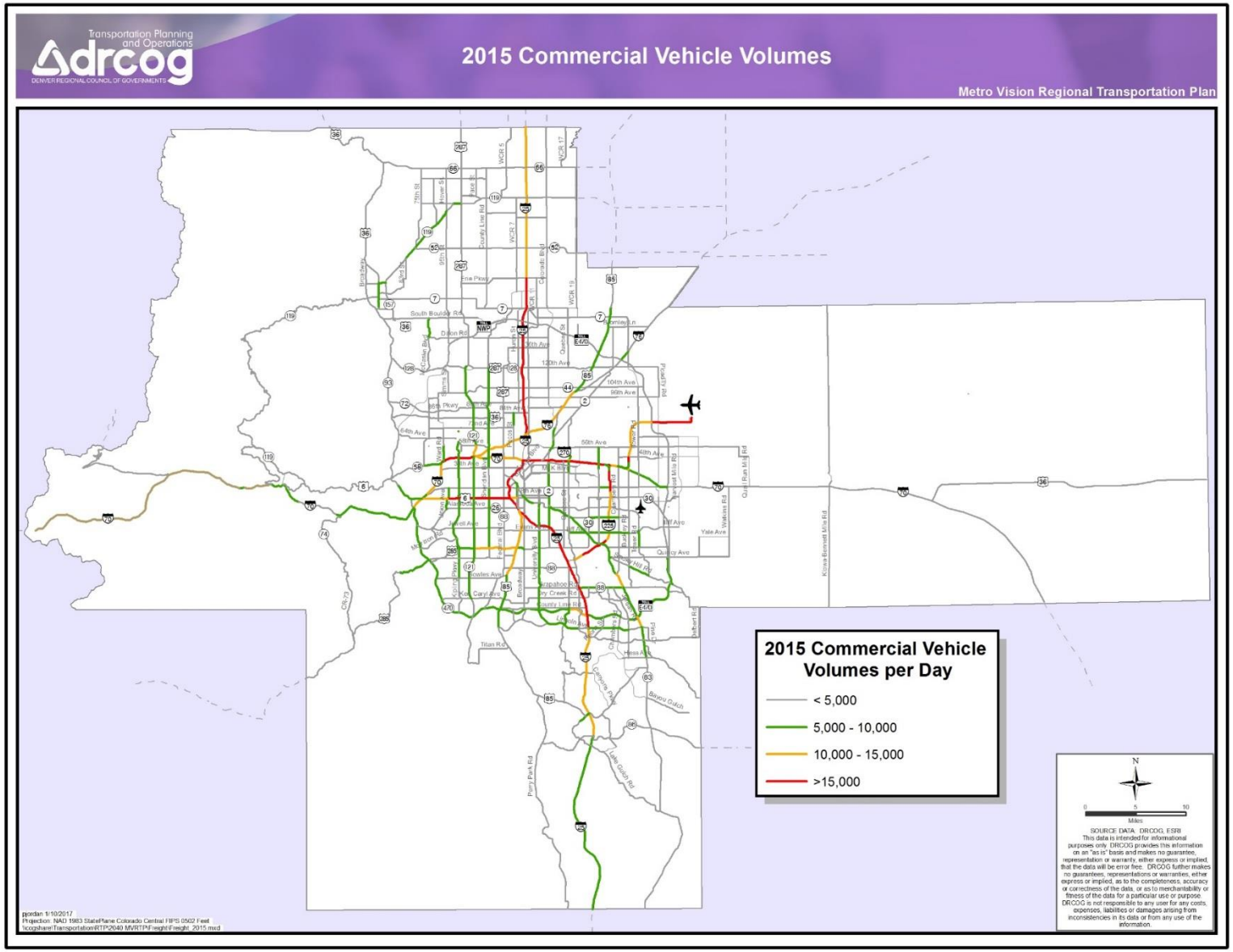
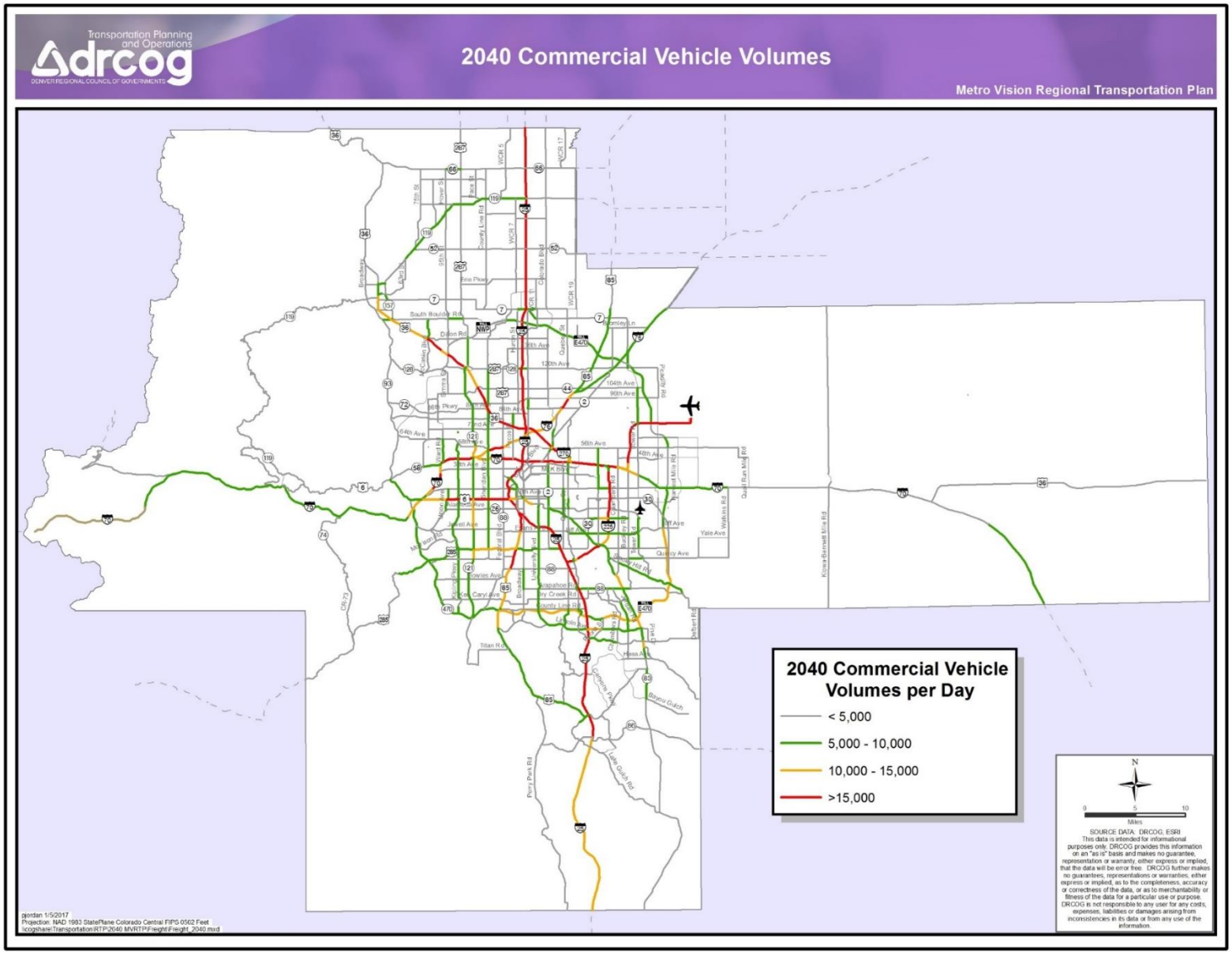


**Figure 4: 2040 Commercial Vehicle Volumes**



## Crash/Safety

During the most recent three-year period available (2011-2013), there were approximately 7,200 crashes involving trucks in the Denver region, resulting in 172 serious injuries and 33 fatalities (Table 1). Truck-involved crashes made up about 4 percent of all crashes and 3 percent of serious injuries, but 6 percent of all fatalities. Between 2011 and 2013, truck-involved crashes increased 15 percent, while total crashes increased only 8 percent. State Highway 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.

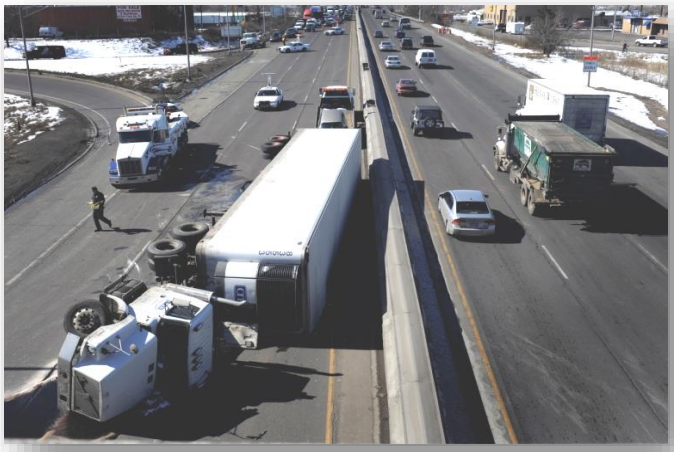
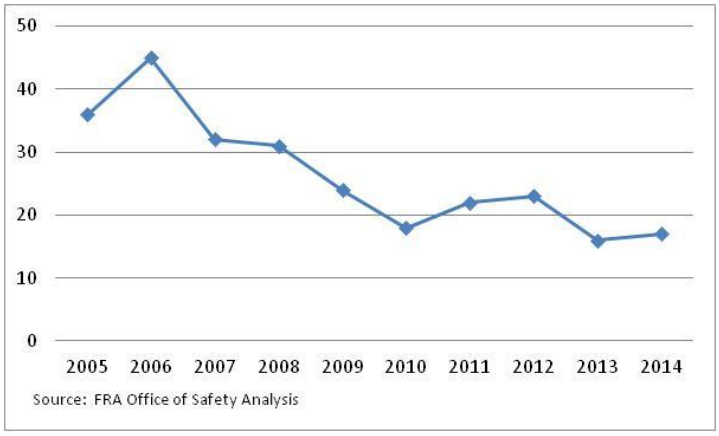


**Table 1: Comparison of Truck and Total Crashes (2011-2013)**

| | Total Crashes | | Serious Injuries | | Fatalities | |
|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent |
| Trucks | 7,205 | 4% | 172 | 3% | 33 | 6% |
| All Vehicles | 182,703 | | 5,276 | | 517 | |

Due to the potential for injury, loss-of-life and delays to fright movement, crashes at rail road 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 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.

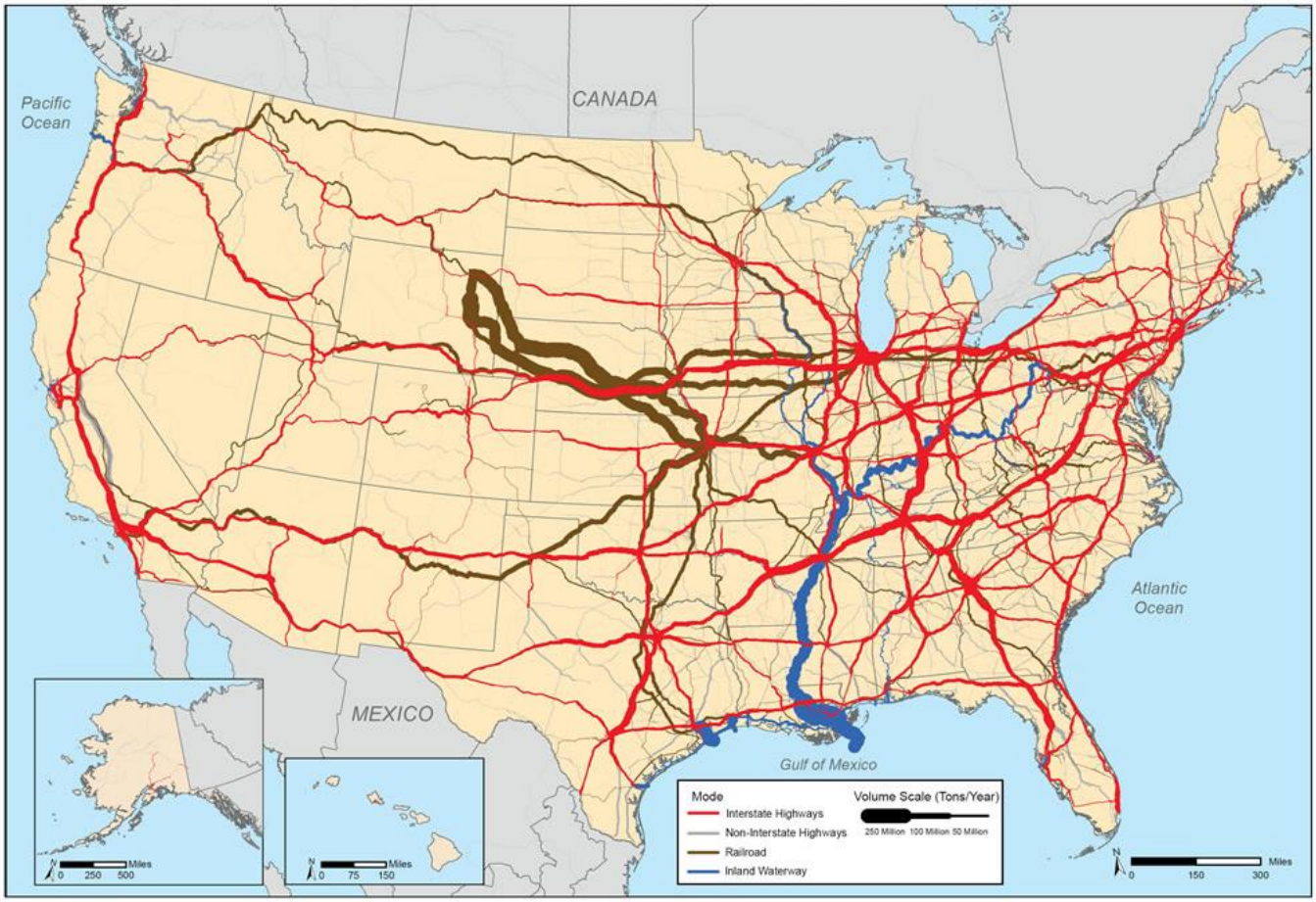
**Figure 5: Colorado Railroad Crossing Crashes (2005-2014)**




## 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 than freight shipped by truck. Freight that is hauled by rail instead of trucks causes less damage to the roadway infrastructure. Figure 6 illustrates the flow of freight by highways, railroads and waterways for 2010. Although 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 Trvansportation 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 or Water Resources, Annual Vessel Operating Activity and Lock Performance Monitoring System data, 2013.

Freight rail traffic in the Denver region is dominated by two Class I railroads: Union Pacific and BNSF Railway. 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 and Great Western Railway of Colorado. Active rail lines in the region are illustrated in Figure 8 along with switching yards, multimodal terminals, and major transfer facilities.

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

Union Pacific operates major north-south lines and east-west lines within the region. The north-south line connects Denver with Cheyenne, Wyoming, and Pueblo. East-west lines connect Denver with Utah and western Colorado to Kansas. RTD purchased from Union Pacific 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.

BNSF Railway and Union Pacific have joint operations and track-sharing agreements south of downtown Denver. The joint line is known as the Consolidated Main Line and operated as a paired track; one track used for northbound traffic and the other track used for southbound traffic.

The Denver Rock Island Railroad has a switching and terminal spur line north of I-25 and 58th Avenue running roughly parallel to I-270 and connecting the Union Pacific and BNSF facilities. The Great Western Railway of Colorado operates branch lines connecting North Front Range communities such as Fort Collins and Loveland to Longmont. Great Western Railway of Colorado has an interchange point with BNSF at Longmont (switching only).

### Major Multimodal Terminals

Figure 2 shows the location of the current Union Pacific and BNSF multimodal rail-truck transfer facilities. They are also listed in Table 2. BNSF operates the Rennicks and Globeville (31st Street) switching yards. BNSF has major terminals and freight transfer facilities to serve trailers on flat cars and auto transport. Union Pacific has major terminals and freight transfer facilities in the Denver region including 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 light rail transit station, Broomfield Park-n-Ride, Civic Center Station, Denver Union Station (Amtrak), Southmoor Park-n-Ride, 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

- Railroad Facilities: BNSF auto/railroad transfer facilities, Southern Pacific Railroad transfer facility, Union Pacific auto/railroad transfer facilities
- Pipeline Facilities: Conoco Pipeline Transfer, Kaneb Pipeline Transfer, Phillips Pipeline, Total Petroleum Pipeline Terminal
- Other Facilities: Denver International Airport, Denver Greyhound Bus Terminal

**Table 2: Existing Multimodal Freight Facilities**

| Name | Location | Type |
|---|---|---|
| Conoco Pipeline Transfer | 56th Ave. and Brighton Rd. | Pipeline Terminal |
| Kanab Pipeline Transfer | 80th Ave. and W. of SH-2 | Pipeline Terminal |
| BNSF Rennicks Yard | 53rd Ave. and Bannock St. | Rail Yard |
| BNSF 31st St. Yard | Globeville Rd. and 38th St. | Rail Yard |
| UP Burham (4th 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. 48th Ave. | Rail-Truck Transfer Facility |
| BNSF TOFC Yard | Pecos St. and 56th Ave. | Rail-Truck Transfer Facility |
| UP Rolla Auto Transfer | 96th Ave. and US-85 | Rail-Truck Transfer Facility |
| UP 40th St. Yard | 40th Ave. and York St. | Rail-Truck Transfer Facility |
| BNSF Irondale Auto Transfer | SH-2 and 88th Ave. | Rail-Truck Transfer Facility |
| UP Pullman Yard | N. of 40th 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 the location of these multimodal terminals in relation to the region's multimodal transportation network.

## Air Cargo

Air cargo activity to and from Denver has grown dramatically over the past 25 years. According to Denver International Airport's Master Plan, total cargo volume is forecasted to increase from approximately 310,800 tons in 2006 to approximately 714,000 tons by 2030. The number of all-cargo aircraft operations is forecasted to increase from about 21,000 in 2006 to about 40,000 in 2030. Air freight is, by its nature, high-value, time-sensitive and linked to the types of retail, service and manufacturing businesses expected to lead the region's future economic development. Denver International Airport handles thousands of packages and containers per day, with much smaller volumes at Centennial, Rocky Mountain Metropolitan and Front Range airports. The aviation section of the Metro Vision Regional Transportation Plan (Section G) contains more detailed information about the region's airport operations and future implications for air cargo.

## Pipelines

Pipelines transport oil products and natural gas into and out of the Denver region. Crude oil is processed into usable fuels such as gasoline and delivered by truck to filling stations. Colorado's only oil refinery is in Commerce City near I-270. Natural gas is used to generate electricity for homes and businesses. Pipeline transfer facilities are shown in Figure 2.

## At-Grade Arterial Railroad Crossings

More than 500 at-grade intersections exist between the rail system and the roadway system in the Denver 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 delays 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 future commuter rail. 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 crossings, such as the Union Pacific crossing at Wadsworth Bypass/Grandview Avenue, the Union Pacific crossing at Pecos Street and the Union Pacific/RTD East Rail crossing at Peoria Street.

## Warehousing

The Denver region is the state's hub for warehousing and distribution activities. Quarterly Census of Employment and Wages data show that almost 3,000 firms (each 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.

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

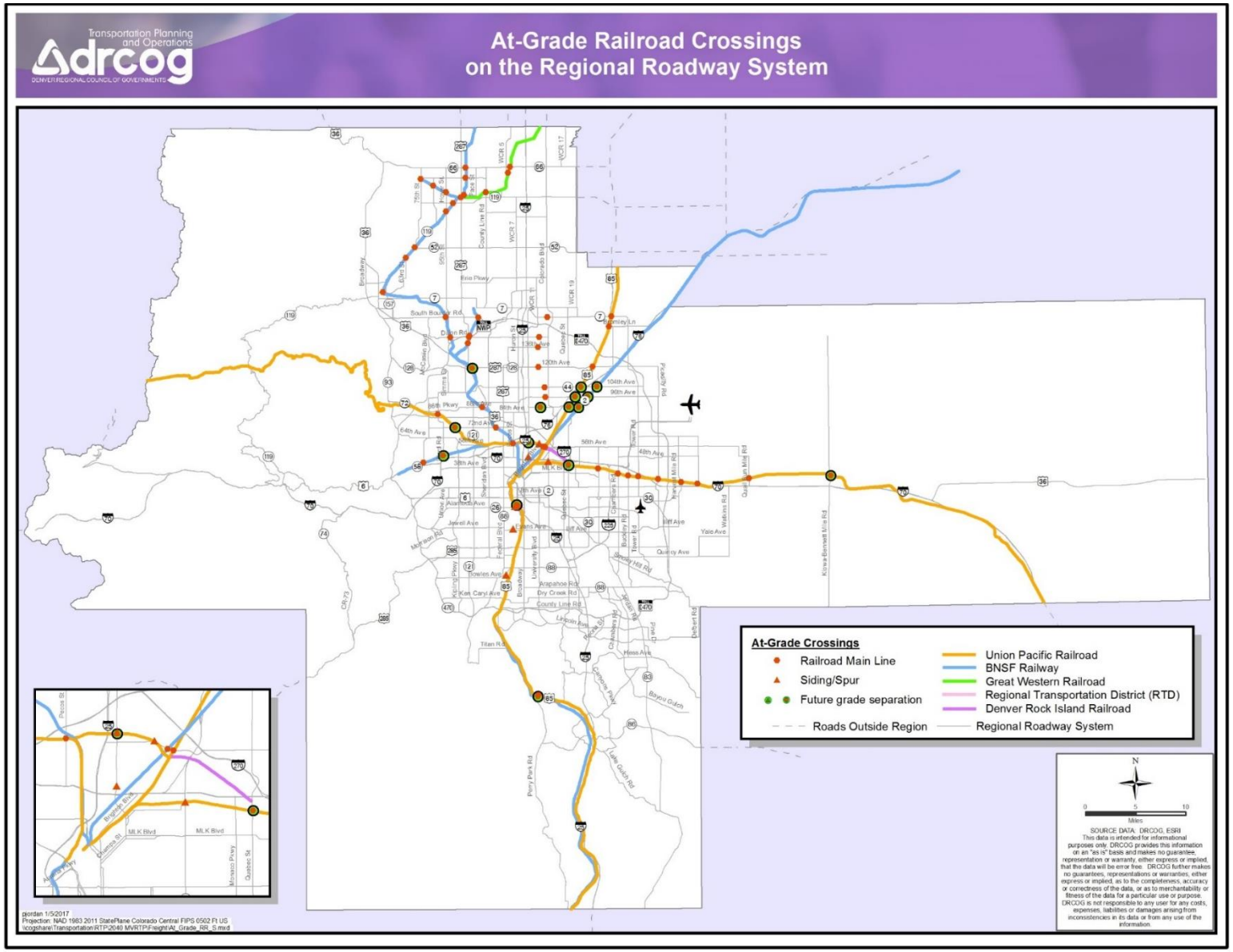
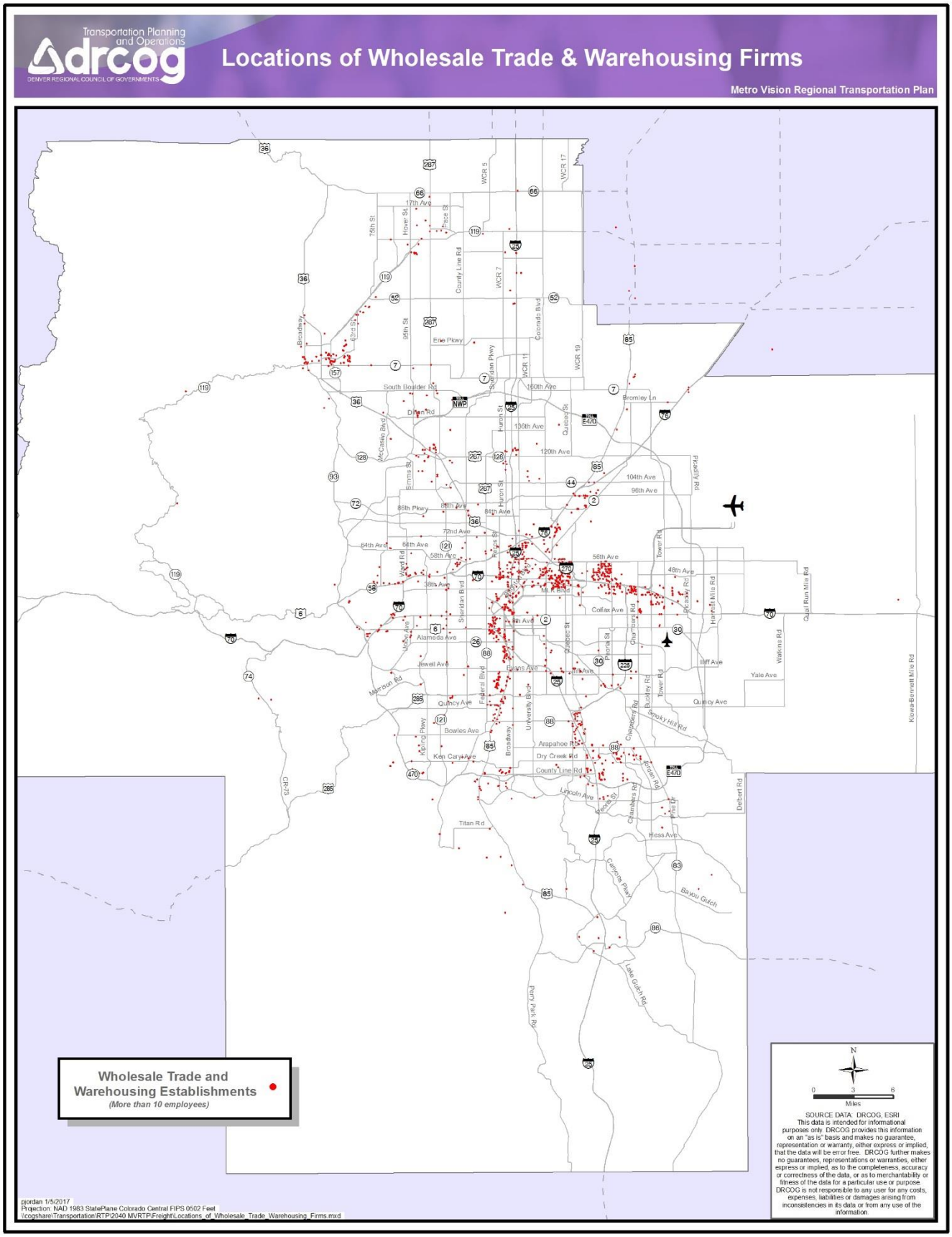


**Figure 8: Locations of Wholesale Trade & Warehousing Firms**

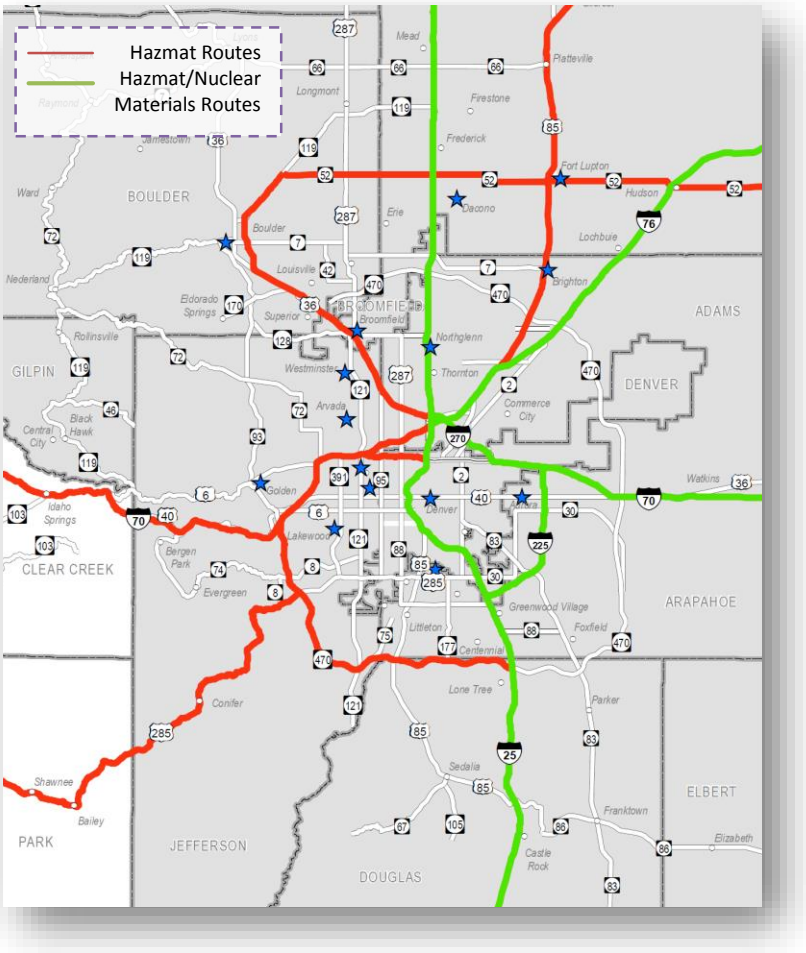


## Hazardous Materials

CDOT is responsible for designating hazardous materials (hazmat) and nuclear materials 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. 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 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 U.S. 36, U.S. 85, U.S. 285, C-470, SH-119 and SH52.

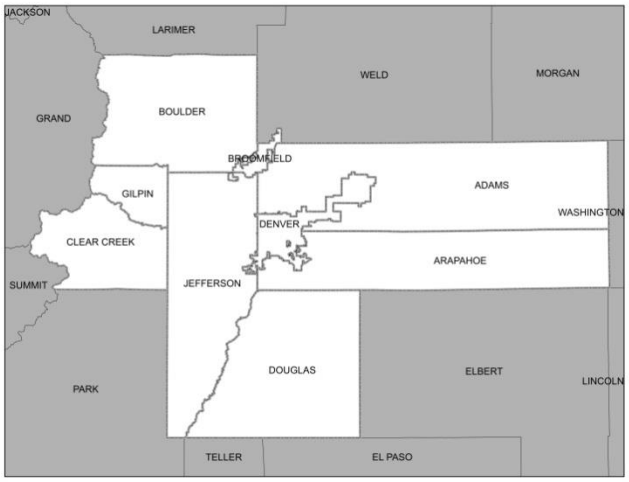
**Figure 9: Designated Hazmat and Nuclear Materials**



## 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 excluding outhwest 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 percent of the statewide total). In addition to oil and gas, agriculture is a key industry in Weld County.

**Figure 10: CDOT Freight Zone 3**




CDOT used the IHS Markit 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 most frequent locations to and from which they are being transported. 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 represent secondary traffic, commodities which are not necessarily produced in that region, but travel through it.

### Transported Out of the Region

Tables 3 and 4 list the top commodities originating in Freight Zone 3 that were 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 the Denver Region by Truck**

| Commodity | 2010 Existing | | 2040 Forecast | |
|---|---|---|---|---|
| | Tons | Percent | Tons | Percent |
| Warehouse and 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% |

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

| Commodity | 2010 Existing | | 2040 Forecast | |
|---|---|---|---|---|
| | Value | Percent | Value | Percent |
| Warehouse and 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 Equipment | $1,565,718,120 | 5% | 7,613,461,930 | 10% |
| Malt Liquors | $1,517,309,710 | 5% | 1,819,391,540 | 2% |
| Orthopedic 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% |
| Miscellaneous 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% |

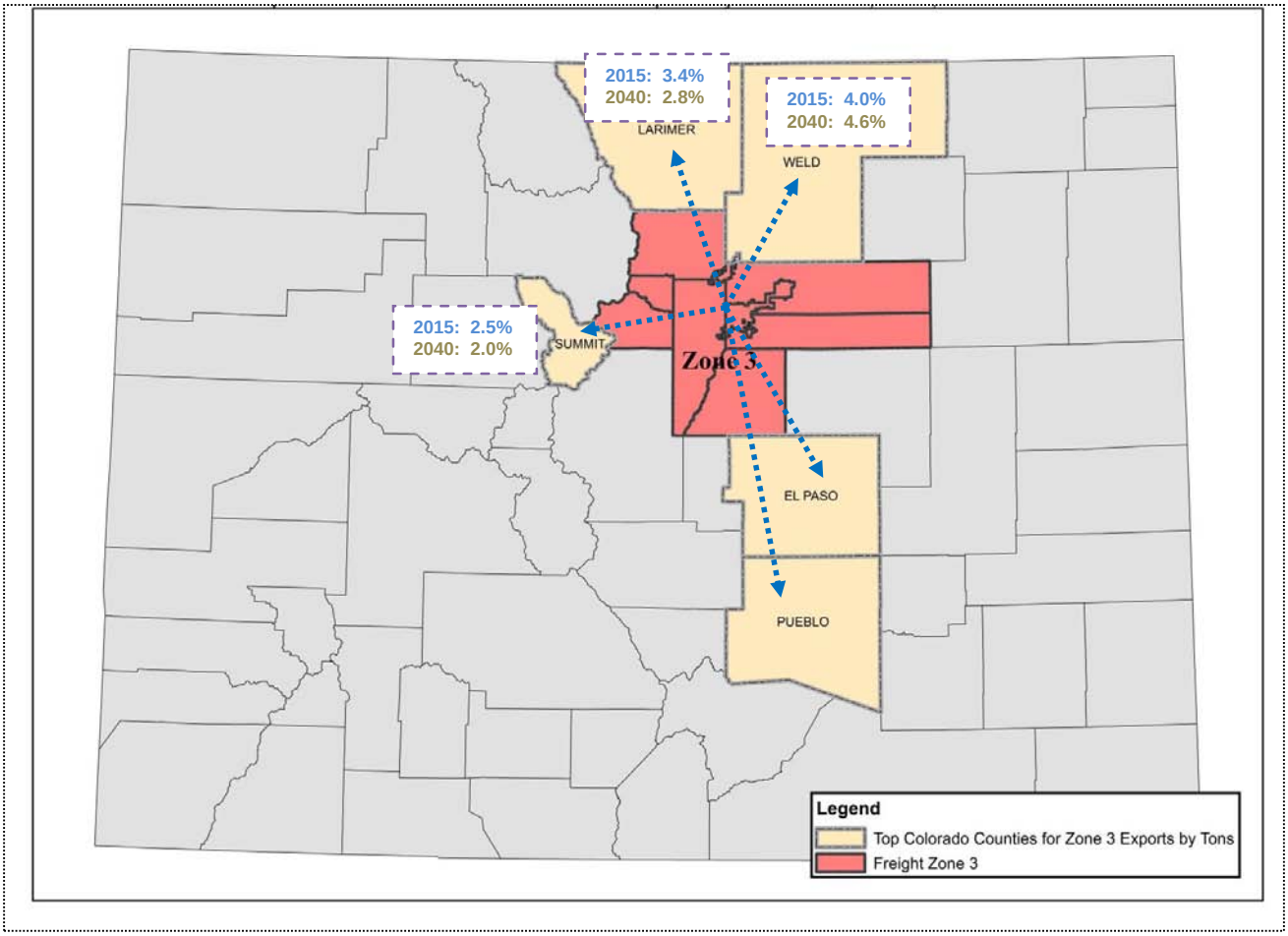
Table 5 shows the tonnage and value breakdown of commodity flows by mode exported from Freight Zone 3 in 2010, as well as 2040 forecasts. Most freight is exported from the Denver region by truck in terms of both tonnage and value—about 98 percent by either measure. The 2040 forecasts are similar. This 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 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 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 separates Weld County from the rest of the DRCOG region into a different freight zone economic region. Even if CDOT had grouped southwest Weld County in Freight Zone 3, the results of Figures 11 and 12 would not likely change.

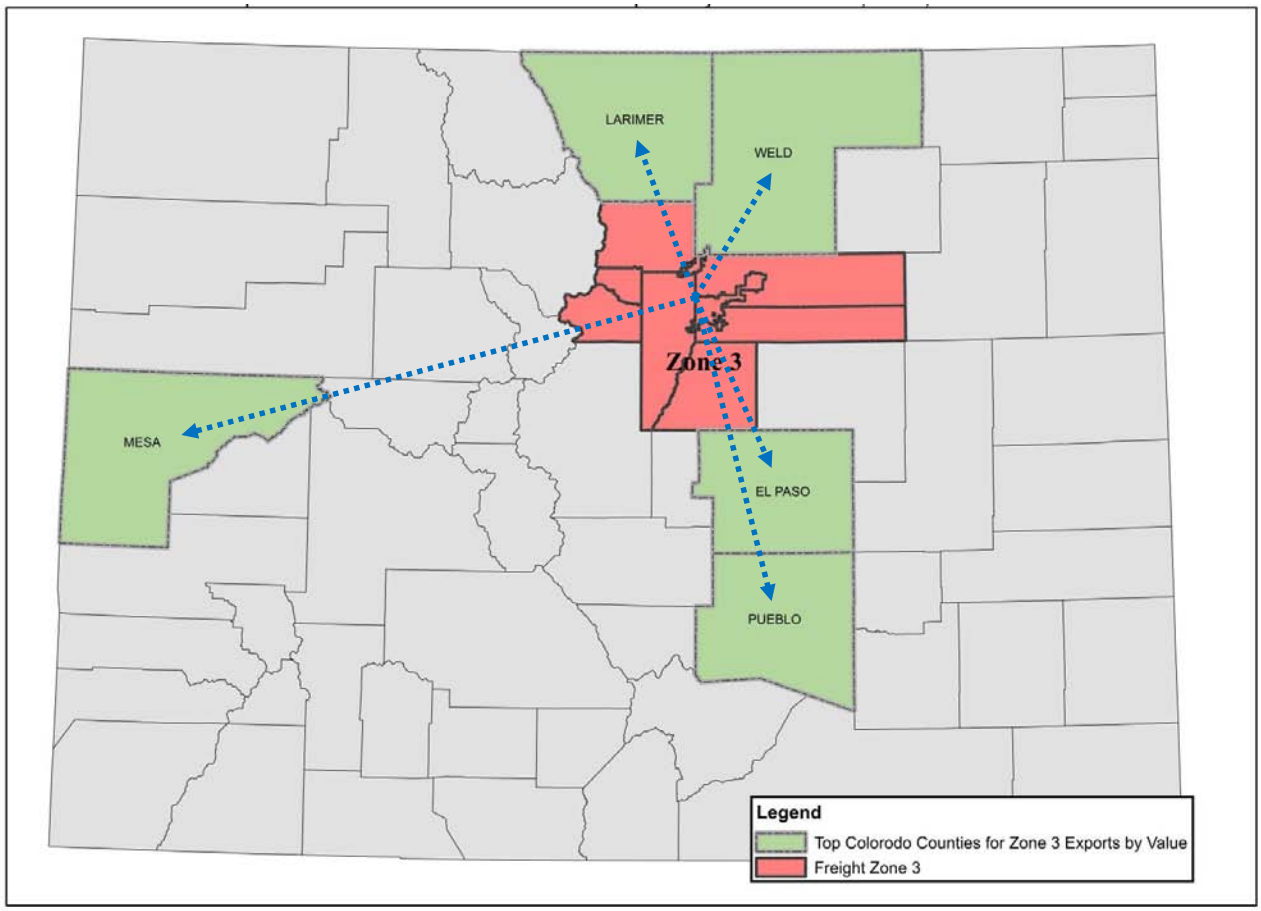
**Figure 11: Top Colorado Destinations of Denver Region Exports by Tons in 2010 and 2040**






2015: 5.1%

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



## 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. Areas that receive freight are known as Business Economic Areas (BEA). The Casper, Wyoming, area was the Denver region's top export destination in 2010 and is forecasted to continue to be its top business economic area for exports in 2040. The top five business economic area destinations for DRCOG region commodity exports do not change between 2010 and 2040, though their ranking changes slightly (for example, Albuquerque and Wichita). 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 | 1,318,840 | 16% | 2,176,950 | 15% |
| Utah Portion of Salt Lake City | 949,770 | 12% | 1,565,610 | 11% |
| New Mexico Portion of Albuquerque | 375,840 | 5% | 634,920 | 4% |
| Kansas Portion of Wichita | 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**

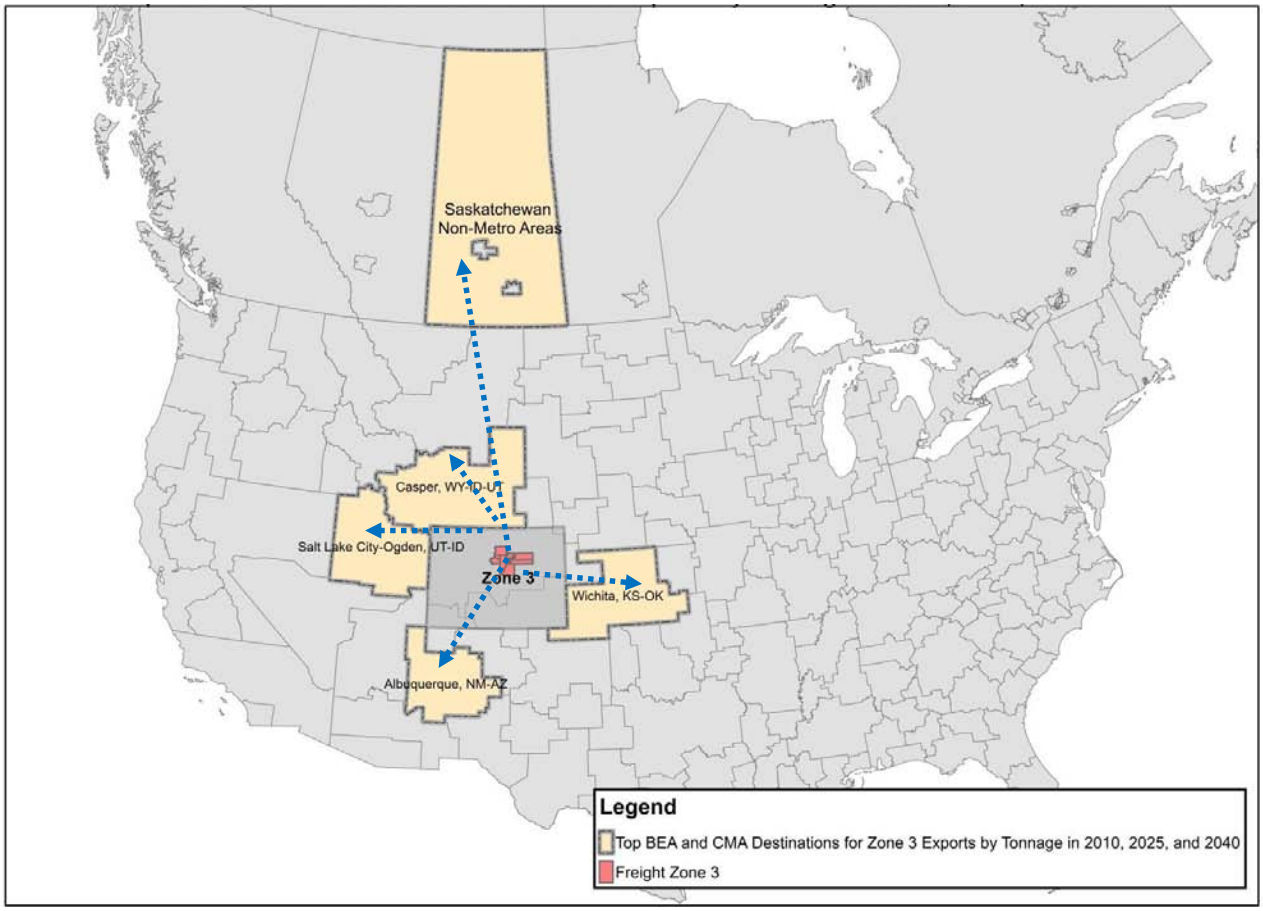
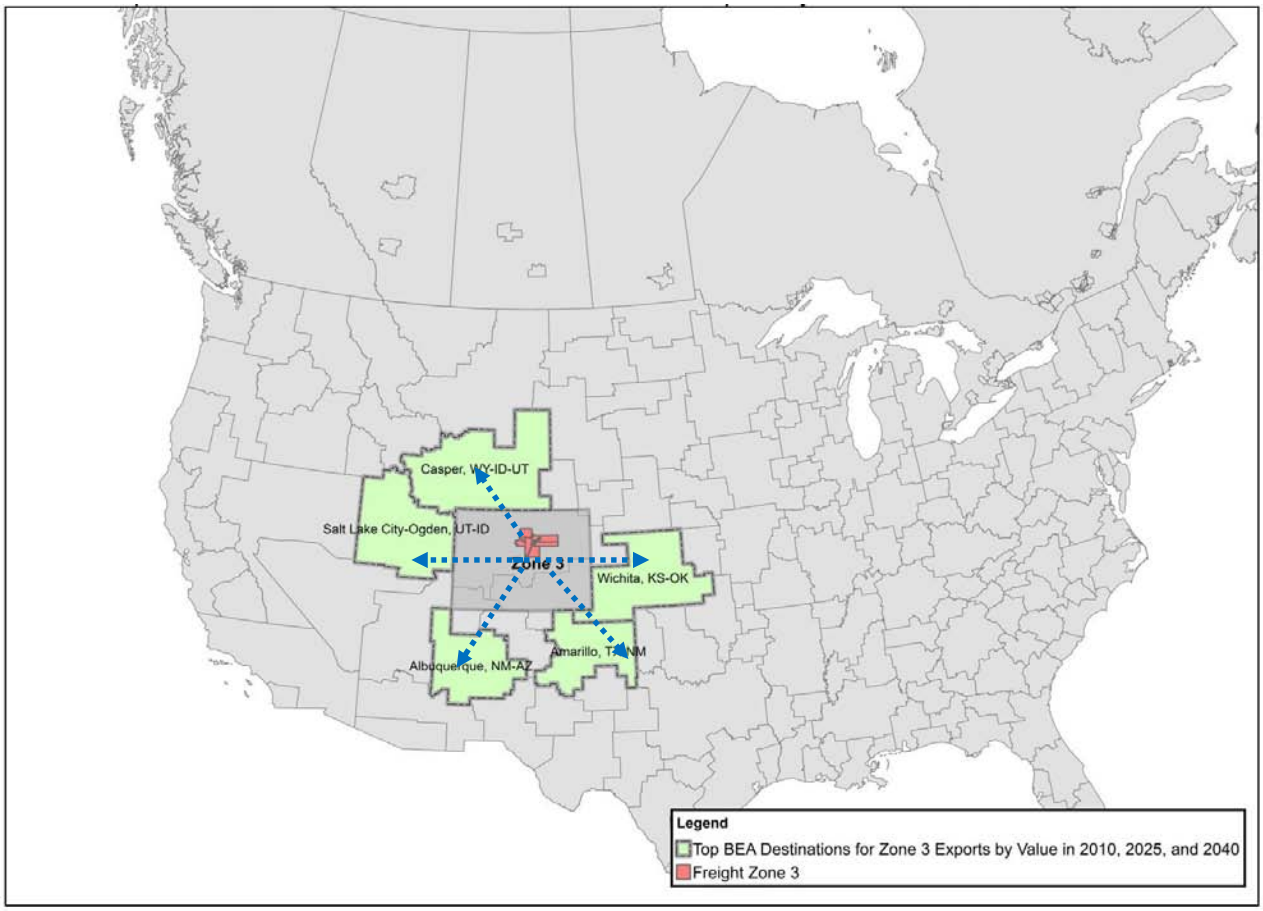



**Table 7: Top Out-of-State Destinations (by Value) of Denver Region Exports by Truck**

| Business Economic Area (BEA) | 2010 Existing | | 2040 Forecast | |
|---|---|---|---|---|
| | Value | Percent | Value | Percent |
| Wyoming Portion of Casper | $1,828,477,320 | 9% | $3,743,802,300 | 7% |
| Utah Portion of Salt Lake City | $1,775,745,960 | 9% | $3,253,535,190 | 6% |
| New Mexico Portion of Albuquerque | $1,292,333,840 | 7% | $2,909,081,890 | 5% |
| Kansas Portion of Wichita | $1,150,107,780 | 6% | $3,580,855,490 | 7% |
| Texas Portion of Amarillo | $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**




## 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 and 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 and 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% |
| Miscellaneous Plastic Products | $1,497,621,040 | 3% | 2,488,609,190 | 2% |
| Electronic Data Processing Equipment | $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 Equipment | $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% |

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 similar. This does not mean that rail, air, and other modes are not important, but the volume of freight moved by trucks underscores the importance of the region's highways, roadways and streets to freight and goods movement.

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

| | 2010 | | 2040 | |
|---|---|---|---|---|
| **Mode Split** | **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 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 depicted in Figures 15 and 16 would not likely change.

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

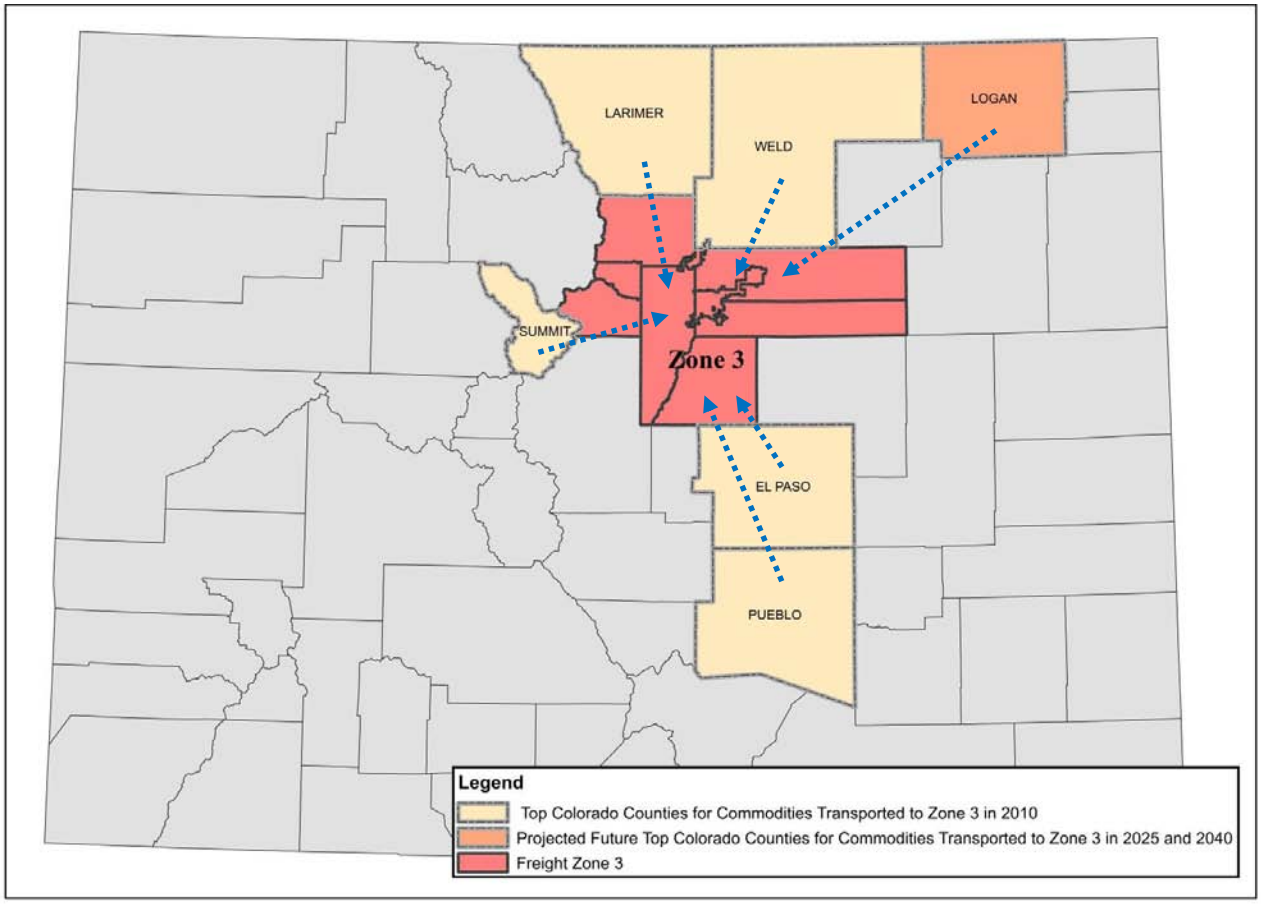
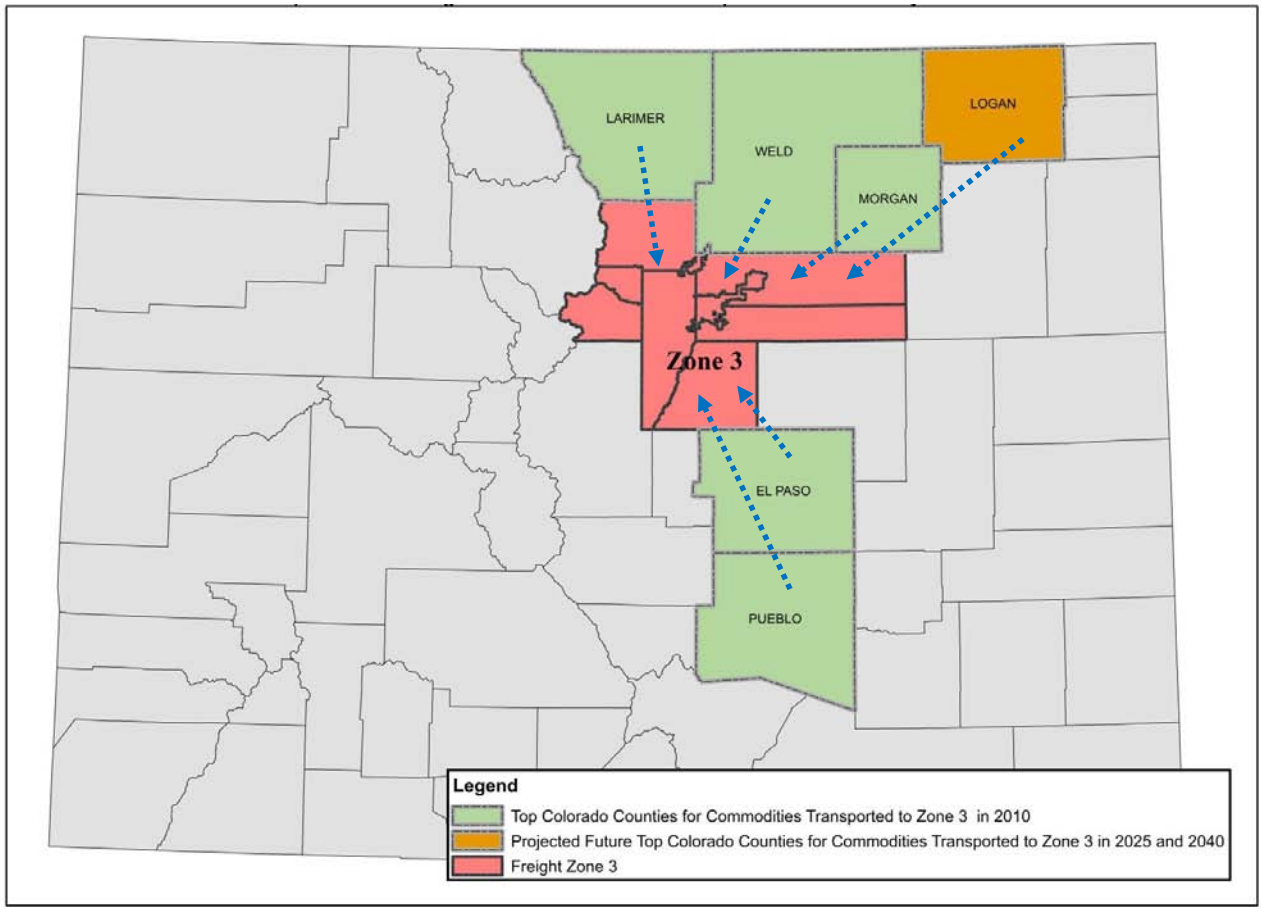


**Figure 16: Top Colorado Origins of Commodities Transported into the Denver Region by Value in 2010 and 2040**



### 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 was the top import origin 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. Areas shown are Business Economic Areas (BEA) accept as noted by CMA (Census Metropolitan Area).

**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 | 1,235,940 | 6% | 2,490,820 | 7% |
| California Portion of Los Angeles | 1,149,340 | 5% | 2,555,990 | 7% |
| Kansas Portion of Wichita | 995,650 | 5% | 2,274,530 | 6% |
| Wyoming Portion of Casper | 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**

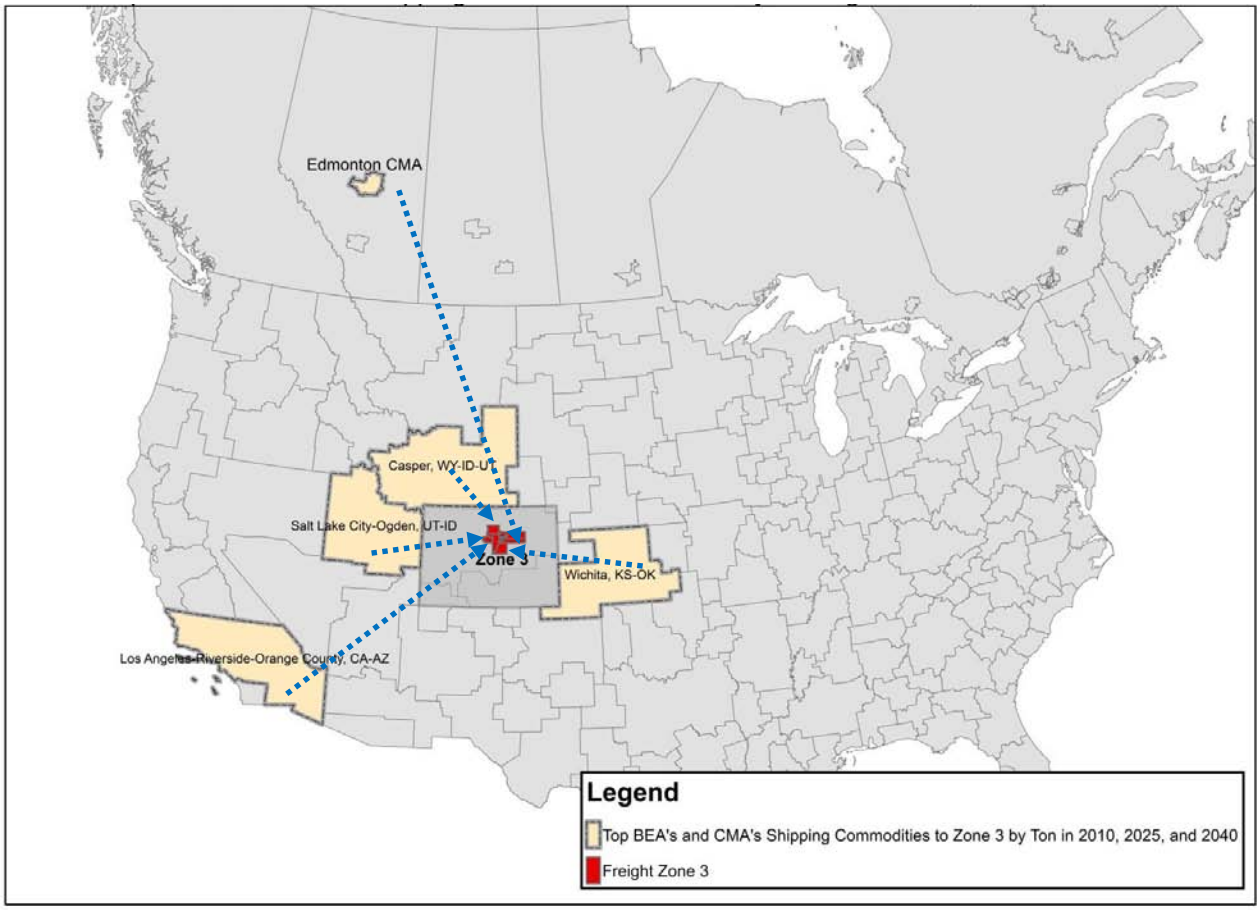
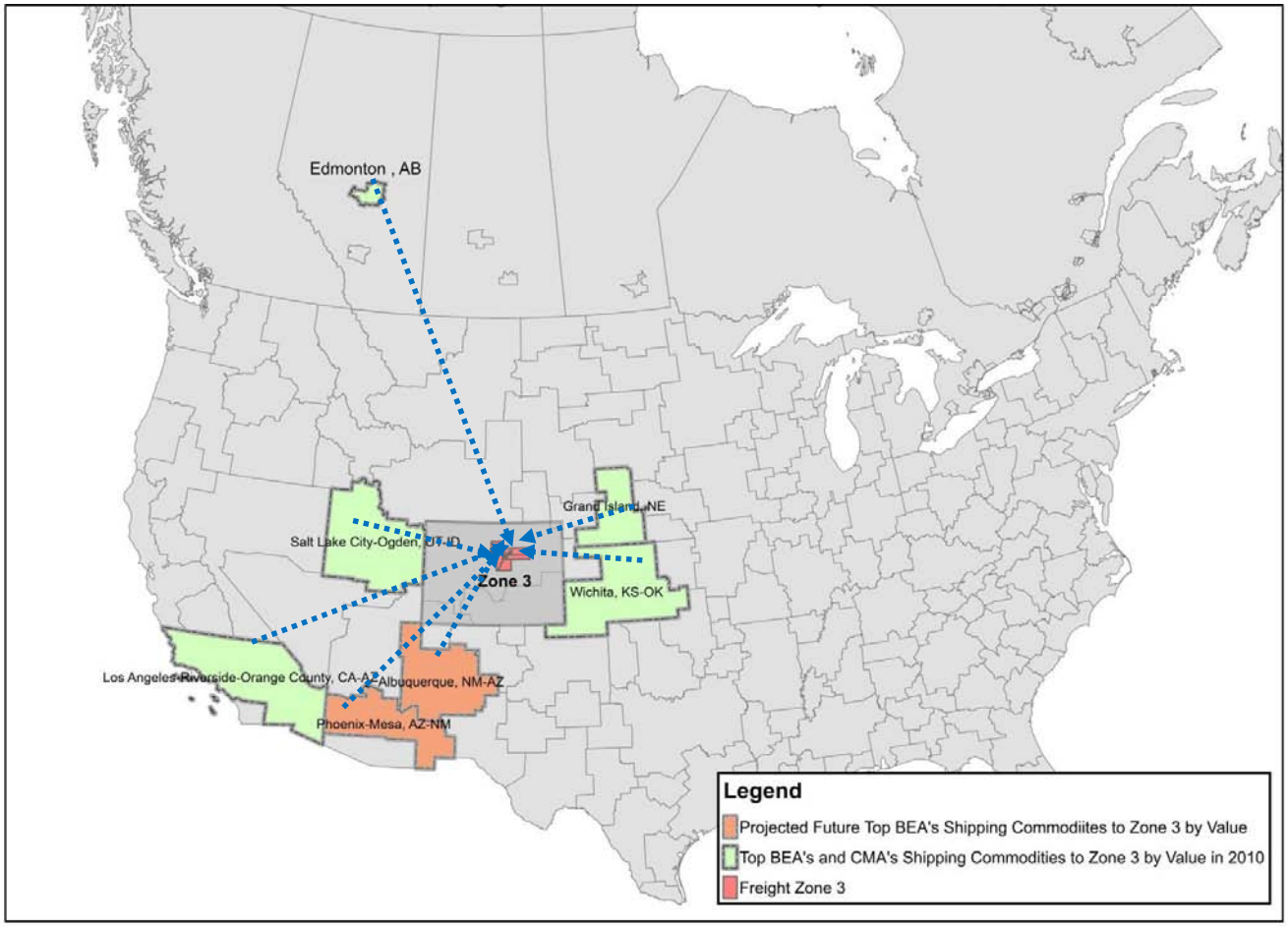


**Table 12: Top Out-of-State Destinations (by Value) of Denver Region Exports by Truck**

| Business Economic Area (BEA) | 2010 Existing | | 2040 Forecast | |
|---|---|---|---|---|
| | Value | Percent | Value | Percent |
| California Portion of Los Angeles | $7,489,348,240 | 18% | $18,790,425,150 | 17% |
| Utah Portion of Salt Lake City | $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 | $1,676,616,910 | 4% | $3,769,683,340 | 3% |
| Grand Island, Nebraska | $1,278,166,320 | 3% | $2,551,631,130 | 2% |
| New Mexico Portion of Albuquerque | $681,291,780 | 2% | $5,523,340,610 | 5% |
| Arizona Portion of Phoenix | $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**



### 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 in 2010, as well as 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 the DRCOG**

| 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 the 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 and 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% |

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% |

## G. MVRTP Freight-Related Transportation Improvements

One of the most consistent feedback themes provided by freight stakeholders is the importance of travel time reliability and the effects 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.
- Efficiently operate, maintain and repair roadways and other transportation facility assets so freight and 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 (U.S. 36 to SH-7): add managed lanes—opened in 2016
- I-25 (Santa Fe Drive to U.S. 6): interchange capacity
- I-70 (Brighton Boulevard to Chambers Road): add two new managed lanes
- I-70 (Empire Junction (U.S. 40) to Twin Tunnels): add peak period shoulder managed lanes
- I-270 (I-25 to I-70): widen from four to six lanes
- I-270/Vasquez Blvd: interchange capacity

- U.S. 36 (I-25 to Table Mesa Drive): add managed lanes—opened in 2015
- U.S. 85 (Highlands Ranch Parkway to County Line Road): widen from four to six lanes
- C-470 (Kipling Parkway to I-25): add toll managed lanes
- SH-2 (72nd Ave. to I-76): widen from two to four lanes
- Pena Boulevard (I-70 to E-470): widen from four to eight lanes
- 88th Ave. (I-76 to SH-2): widen from two to four 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 in 2009. Two alternative alignments were determined to have a positive benefit-to-cost ratio. Either alignment could result in the diversion of a substantial amount of freight rail traffic that currently uses the Consolidated Main Line through the Denver region.
- *Railroad grade-separation bridges and 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 Union Pacific at SH-67 (Sedalia)
  - BNSF/Union Pacific at Santa Fe Drive/Kalamath Street
  - RTD at 88th Avenue
  - Union Pacific at 72nd Avenue
  - Union Pacific at 88th Avenue
  - Union Pacific at 96$^{th}$ Avenue
  - Union Pacific at 104$^{th}$ Avenue
  - Union Pacific at Broadway (SH-53)
  - Union Pacific at Quebec Street frontage road ramps
  - Union Pacific at SH-79
  - Union Pacific at Washington Street
- *Railroad grade-separations on local streets off the regional roadway system* will be considered at critical locations.

DRCOG's Transportation Improvement Program (TIP) also contains many multimodal transportation projects that will benefit freight and goods movement, such as the U.S. 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.

Other improvements 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.

In 2015, the City and County of Denver reached agreement with adjacent jurisdictions to begin developing an aerotropolis around Denver International Airport. Potential freight implications include constructing air cargo and airport-related storage, warehouse, transfer and other facilities for higher-value goods.

Landowners near Front Range Airport have proposed Spaceport Colorado, an air/rail/highway multimodal facility. Planned or envisioned improvements that will benefit terminals include

- widening several regional system roadways near multimodal terminals, and
- constructing new multimodal freight centers to accommodate truck/rail transfers and relocate some existing multimodal terminals.

## H. Operations and Technology

Operations and technology are important aspects of freight and goods movement. Transportation system management and operation strategies safely provide more reliable trip travel times and reduce the amount of delays faced by drivers, passengers, trucks and commercial vehicles on the roadway and transit system.

The strategies positively affect 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 delivery of services. At a federal level, the U.S. Department of Transportation has recognized the importance of operations and technology by including in the National Intelligent Transportation Systems Architecture components on

carrier operations and fleet management, cargo movement and condition, roadside safety, driver security, hazmat management and commercial vehicle tracking.

Technology plays an ever increasing role in freight through advances such as real-time traffic, travel and weather data and managing fleet deployment and payload logistics. Connected vehicle applications are an emerging technology providing information such as curve speed warnings, oversize vehicle warnings and smart roadside wireless inspection of vehicles.

CDOT recently unveiled its RoadX initiative to use cutting-edge technology to improve transportation system safety, mobility and efficiency. Such technology could include smart device apps, connected vehicles, truck platoons linked through technology and virtual guardrails. CDOT will initially invest $20 million to start RoadX and partner with the private sector to evolve the program.

Since 2008 CDOT's Heavy Tow or Quick Clearance winter program offers standby heavy wreckers at strategic locations along I-70 between Floyd Hill and Vail Pass. According to CDOT, this allows stalled commercial vehicles to be moved quickly from traffic lanes. The program reduces traffic congestion and delays along the I-70 West corridor. Service is provided between late November and late April and sometimes during holidays or severe storms as needed. Before implementation of the Heavy Tow or Quick Clearance program, the average time to clear a commercial vehicle from a traffic lane was approximately 50 minutes. This program has cut that time in approximately half.

An article in the Winter edition of *In Transition* discusses how 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 suburban warehouses, smaller sites are popping up within a 10- to 30-minute drive from central business districts. These sites tend to be smaller and often move-in ready. Because of their central location and ability to enable shorter delivery turnarounds to population-dense areas, these sites are sometimes referred to as last-mile terminals. E-commerce companies such as Amazon are investigating another emerging concept—drone delivery. Along with other emerging and rapidly-evolving technologies, drones could potentially revolutionize freight travel and delivery, but their transportation and mobility implications are still unknown.

In the near future, autonomous vehicles and drones will make deliveries. For example, Anheuser-Busch recently collaborated with Otto, a subsidiary of Uber that is developing self-driving truck technology, on a test run to use an autonomous vehicle to ship beer from Fort Collins to Colorado Springs.

## I. Air Quality Concerns Related to Freight Movement

The economic benefit of freight travel is not without environmental effects, particularly to the region's air quality. A large percentage of heavy trucks are powered by diesel engines. The state Air Pollution Control Division estimates that heavy-duty diesel vehicles are responsible for about 50 percent of the primary particulate matter emissions of less than 10 microns from motor vehicles. Similarly, heavy-duty diesel engines are a large contributor to nitrogen oxide emissions. Continued improvements to diesel engines and fuels, including alternative fuels to the extent practical for the freight industry, will result in cleaner running trucks. Improvements that reduce roadway and rail congestion will also reduce pollution from truck and rail operations.

In August 2016 the U.S. Environmental Protection Agency and the National Highway Traffic Safety Administration jointly finalized standards for medium- and heavy-duty vehicles that would improve fuel efficiency and cut carbon pollution to reduce the effects of climate change, while bolstering energy security and spurring manufacturing innovation.

These standards cover model years 2018-2027 for certain trailers and model years 2021-2027 for semi-trucks, large pickup trucks, vans and all buses and work trucks. The standards are expected to lower carbon dioxide emissions by approximately 1.1 billion metric tons, save vehicle owners fuel costs of about $170 billion and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program.

## J. Summary – Eye Toward the Future

Freight and goods movement has become a greater planning emphasis at the federal, state, regional and local levels. Many freight-related issues, concerns and solutions apply to the region's entire transportation system, while some are specific to freight and goods movement. As with other components of the MVRTP, DRCOG, CDOT, local governments, and key stakeholders will continue to work closely with freight stakeholders to plan for the future. The entities that have collaborated to make the MVRTP possible recognize that rapid technological evolution requires the region to be nimble, flexible and responsive to adapt quickly to changing trends and innovations.

# APPENDIX 6

## 2040 MVRTP Coordinated Transit Plan

# 2040 MVRTP Appendix 6
## DRCOG Coordinated Transit Plan

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# Section I: Introduction

Transit is a vital part of the DRCOG region's multimodal transportation system, connecting people to jobs, schools, shopping, medical care, and recreation. It also promotes independence and economic development. The region's transit system must also increasingly address major trends, such as a rapidly aging population, new technology, an evolving economy, and changing residential and workplace preferences. Transit services are available throughout the DRCOG region in rural, suburban, and urban areas.

Though the region is making unprecedented investments in transit service and facilities through FasTracks and other efforts, the envisioned transit system far exceeds anticipated revenues through 2040. Thus, coordination is increasingly important to optimize existing funding, services, and facilities. Innovative funding alternatives, technology, and other new approaches are also important.

## A. Plan Purpose & Federal Requirements

The DRCOG Coordinated Transit Plan is the

1. Transit component of DRCOG's Metro Vision Regional Transportation Plan (MVRTP), and
2. Federally-required Coordinated Public Transit Human Services Transportation Plan for the DRCOG region.

The Coordinated Transit Plan inventories existing transit services and identifies fiscally constrained and envisioned transit service and system needs for the DRCOG region. It looks at both general public transit and human service transportation. These services are not mutually exclusive. For example, while many older adults and individuals with disabilities will be served by transit modes specifically designed for their needs, many more will use general public transit. This plan integrates transit modes intended for specific populations and for the general public. The Federal Transit Administration (FTA) requires that projects selected under the FTA 5310 grant program (Enhanced Mobility for Seniors and Individuals with Disabilities) be included in a Coordinated Transit Plan like this one.

The purpose of this plan is to improve mobility for older adults, individuals with disabilities, low-income individuals, and others with mobility challenges. Existing service providers are identified, service gaps

are forecasted, and strategies are identified to address mobility needs. As the, the Coordinated Transit Plan also addresses the following FTA requirements, including:

- An assessment of available services that identifies current transportation providers (public, private, and non-profit);
- An assessment of transportation needs for individuals with disabilities and older adults. (This assessment can be based on the experiences and perceptions of the planning partners, on more sophisticated data collection efforts, and gaps in service.);
- Strategies, activities, or projects to address the identified gaps between current services and needs, as well as opportunities to achieve efficiencies in service delivery, and
- Priorities for implementation based on resources, time, and feasibility for implementing specific strategies and activities identified[1].

As noted previously, FTA requires projects funded in the FTA 5310 program be included in the Coordinated Transit Plan. However, "FTA maintains flexibility in how projects appear in the Coordinated Plan. Programs and projects may be identified as strategies, activities, or specific projects addressing an identified service gap or transportation coordination objective articulated and prioritized in this plan[2]." For example, a proposed 5310 project to expand transportation services for individuals with disabilities is consistent with the section of the Coordinated Transit Plan defining the needs for expanded services for that population.

## B. Public and Stakeholder Outreach

Public and stakeholder participation was essential in preparing this plan. Older adults; individuals with disabilities; representatives of public, private, and nonprofit transportation and human service providers; and other members of the public actively participated in developing this plan.

Staff received valuable input from key partners, including the Denver Regional Mobility and Access Council(DRMAC), the Regional Transportation District (RTD), and the Colorado Department of Transportation (CDOT). A variety of techniques were used to provide information and solicit public

[1] FTA Circular C 9070.1G Enhanced Mobility of Seniors and Individuals with Disabilities Program Guidance and Application Instructions- June 6, 2014

[2] FTA Circular C 9070.1 G Enhanced Mobility of Seniors and Individuals with Disabilities Program Guidance and Application Instructions- July 7, 2014

comment, including public forums and meetings, surveys, and community planning sessions. Major outreach and engagement activities that helped develop the Coordinated Transit Plan include the following:

**DRCOG and DRMAC Forum**

DRCOG and DRMAC jointly hosted a public forum in 2014 to solicit input for the Coordinated Plan. More than 30 people attended and more than 20 organizations directly involved in serving older adults, individuals with disabilities, and low-income individuals were represented.

**2016-2019 DRCOG Area Plan on Aging – Public Input from Community Conversations**

The DRCOG Area Agency on Aging (AAA) conducted 17 Community Conversations and talked with almost 500 people between February and May of 2015. In each Community Conversation, the role of the AAA was described, service categories were explained and examples given of services in each category. Participants identified services most needed to increase or sustain independence for older adults in their community.

**CDOT Statewide Transit Plan and DRCOG Open House**

DRCOG and CDOT jointly hosted an open house for CDOT's Statewide Transit Plan and DRCOG's Metro Vision Regional Transportation Plan in 2014.

**CDOT Statewide Transit Survey of Older Adults and Adults with Disabilities**

For its Statewide Transit Plan, CDOT conducted a statewide survey of older adults (65 years or older) and disabled (18 years or older) residents of Colorado regarding their travel behavior, transportation priorities, needs, and preferences. Of the 3,113 participants statewide, 626 were from the DRCOG region.

**Local Coordinating Councils**

A Local Coordinating Council is a formal, multi-purpose, long-term alliance of community organizations, individuals, and interest groups that work together to achieve common goals regarding human service transportation. Local Coordinating Council promote efficient, accessible, and easy to arrange transportation options in their communities.

There are Local Coordinating Councils representing each county in the DRCOG region. These organizations are in various stages of assessing and prioritizing needs. In 2013, DRMAC partnered with four Local Coordinating Councils in the DRCOG region and the University of Colorado-Denver to develop needs assessments and service gaps analyses. Studies were prepared for the Local Coordinating Councils

in Adams, Arapahoe, Boulder, and Broomfield Counties. Douglas and Jefferson Counties completed needs assessments with help from consultants. All of the needs assessments and gaps analyses were reviewed as important input for this plan.

**Community Assessment Survey for Older Adults (CASOA™)**

DRCOG's AAA contracted with the National Research Center to conduct a **Community Assessment Survey for Older Adults** ™. The 2015 Community Assessment Survey for Older Adults ™ is a statistically valid survey of the needs of older adults as reported by older adults themselves in communities throughout the DRCOG AAA's planning area. The Boulder and Weld County AAAs both conducted their own surveys.

**County Council on Aging Surveys**

DRCOG AAA staff conducted this survey at County Council on Aging meetings for each of the eight counties the DRCOG AAA serves. The survey results inform the planning process:

- Developing the AAA Four Year Plan (2015-2019);
- AAA 2015-2017 Older Americans Act/State awards for Senior Services, and
- Coordinated Transit Plan.

The Boulder and Weld County AAAs also conducted similar surveys.

**2013 RTD Paratransit Customer Satisfaction Survey**

A random sample of about 6,800 certified paratransit customers (approximately 50% of the active user database) participated in the survey. The survey is important because RTD uses its results to

- learn customers' overall perceptions;
- compare service types or service areas;
- monitor the success of improvement efforts, and
- prioritize projects.

**United States of Aging Study of Denver Region**

The United States of Aging Study was created by the National Council on Aging, the National Association of Area Agencies on Aging, and United Health Care in 2012 to study community preparedness for an aging population. Each year, different metropolitan areas across the country are chosen to be oversampled in a national survey. The 2015 survey conducted a more thorough sampling and analysis

for the Denver region. DRCOG staff served on the Local Engagement Committee. More information about the survey can be found at https://www.ncoa.org/news/usoa-survey/.

**DRMAC Membership Meetings**

DRMAC holds regular membership meetings which are open to the public. The members represent specialized transportation providers, riders, advocacy groups and funders.

**DRCOG Board & Committee Meetings**

All DRCOG meetings are open to the public. The meetings provide a forum for citizens to provide input on various topics including transportation topics covered in this plan.

**RTD Board & Committee Meetings**

RTD is governed by a 15-member publicly elected Board of Directors. Directors are elected to a four-year term and represent a specific district. Each RTD Board and committee meeting (several per month) includes time for public input.

**RTD Citizens Advisory Committee**

RTD's Citizens Advisory Committee meets quarterly to advise RTD. Committee members are appointed by the RTD Board of Directors to three-year terms. The meeting venue alternates around the region to make it easier for stakeholders to offer input.

**RTD Local Government Meetings**

RTD holds regular meetings with its local government planning partners including municipalities, counties other transit providers, community based organizations, and DRCOG.

**Community Living Advisory Group to the Governor of Colorado**

The Community Living Advisory Group worked closely with the Colorado Commission on Aging and other planning groups to consider and recommend changes to the delivery of long term services and supports through Medicaid managed care programs. Transportation was one of the key items discussed.

### Sustainable Communities Initiative

DRCOG's Sustainable Communities Initiative, financed by a three-year grant from a federal collaboration of the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation and the U.S. Environmental Protection Agency, addressed ways in which jurisdictions, housing and economic development agencies, investors and developers, and non-profit organizations can work together to focus future housing and jobs around transit stations. Sustainable Communities Initiative was a

coordinated effort among 86 partner organizations led by DRCOG to address one of the region's most pressing and exciting challenges: leveraging the planned multi-billion-dollar expansion of the transit system to meet other regional needs and opportunities.

## C. Definitions

Several important terms are used throughout the Coordinated Plan and are defined in Figure 1.

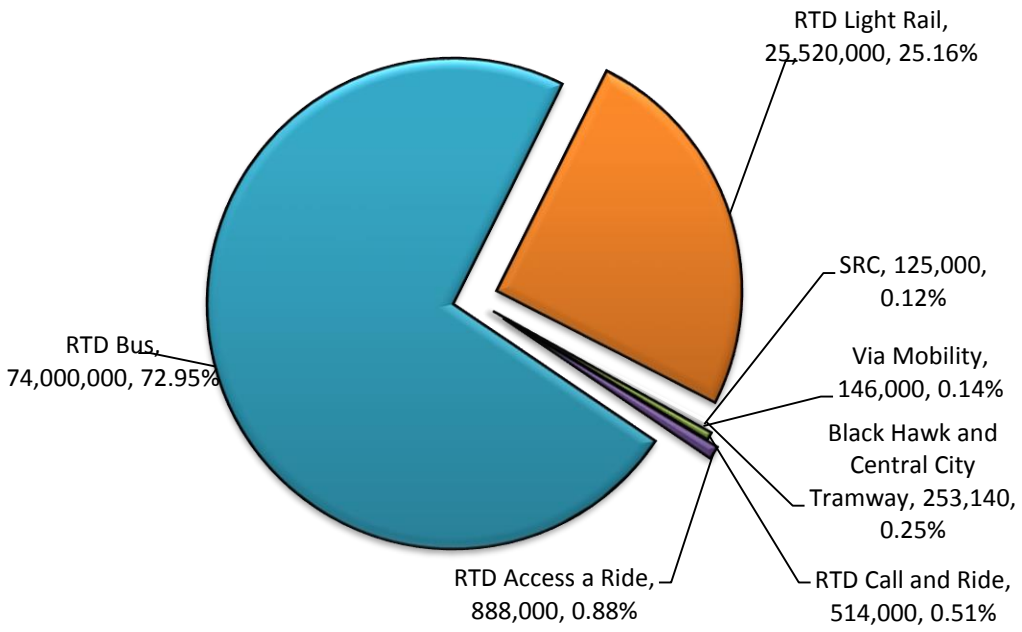
**Figure 1: Definition of Terms**

- **demand response:** any non-fixed route system of transporting individuals that requires advanced scheduling by the customer, including services provided by public entities, nonprofits, and private providers
- **door-through-door services**: personal, hands-on assistance for persons who have difficulties getting in and out of vehicles and buildings
- **fixed route:** a system of providing designated public transportation in which a vehicle is operated along a prescribed route according to a fixed schedule
- **general public transportation:** regular, continuing shared-ride surface transportation services that are open to the general public
- **human service transportation:** shared-ride surface transportation services (often demand response) that are open to segment(s) of the general public defined by age, disability, or low income
- **Local Coordinating Council:** an alliance of community organizations and individuals that work together to achieve common goals regarding human service transportation
- **paratransit:** complementary transportation service required by the ADA for individuals with disabilities who are unable to use fixed route transportation systems
- **public transportation:** regular, continuing shared-ride surface transportation service (demand response or fixed route) that are open to the general public and/or segment(s) of the general public defined by age, disability, or low income
- **Regional Coordinating Council:** an alliance of community organizations and individuals that works together to identify and fulfill the public and human service transportation needs of their region focusing on travel across local jurisdictional boundaries
- **transit:** transportation by a conveyance that provides regular and continuing general or special transportation to the public
- **transit dependent person:** someone who must use public transportation for his/her travel

# Section II: Assessment of Available Transit Services

This section profiles existing transit services and facilities in the DRCOG region and their ridership. The region's transit services include general public transportation, paratransit, and human service transportation. The largest operator of general public transportation in the DRCOG region is the Regional Transportation District (RTD). RTD operates general public transportation and paratransit. Conversely, human service transportation is provided by several non-profit, for-profit, and volunteer organizations. Figure 3 shows the total annual boardings for RTD, Black Hawk and Central City Tramway, and the region's two largest human service transportation providers (Via Mobility Services and Seniors' Resource Center[3]). In a given year RTD comprises more than 98% of the total boardings in the DRCOG region. RTD's system wide ridership in 2015 was just under 102 million. Average weekday boardings during the period from December 2014 to November 2015 was almost 340,000.

**Figure 2: Annual Ridership- RTD, Black Hawk & Central City Tramway, Via Mobility Services, and Seniors' Resource Center**

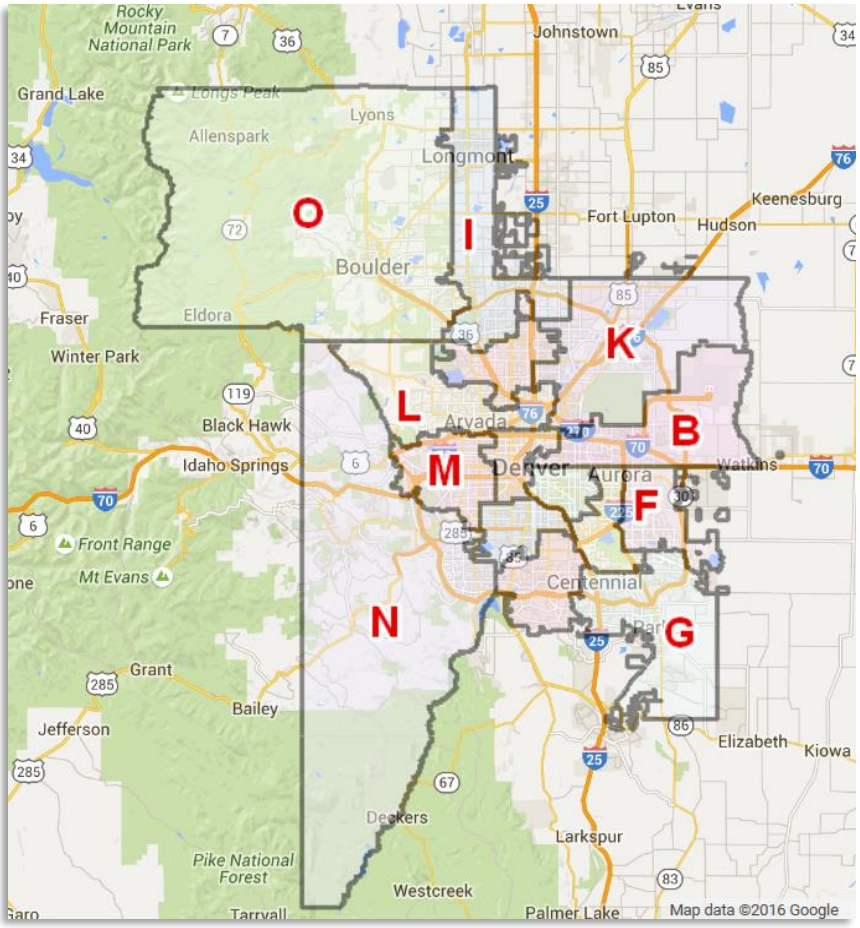



[3] SRC 2014 data from FTA 5310 Application; Via Mobility 2014 data from Via *2014 Annual Report to the Community*; RTD 2015 Data from *Service Performance 2015 Networked Family of Services*

## A. RTD Service Boundaries

RTD's boundary spans a 2,340 square mile area with 2.8 million people in eight counties. This large district covering rural, suburban, and urban areas has diverse terrain including mountains and plains. In addition, there are many parcels of open space. Some places within the boundaries are currently unserved for a variety of reason. RTD decides where service should be provided and at what level are based on its service standards.

**Figure 3: RTD Service Boundary and Board of Director District Map**




## B. Bus Service

### RTD Fixed Route Bus

RTD has almost 150 local, airport and regional fixed bus routes serving approximately 10,000 bus stops and more than 70 Park-n-Rides with 30,000 parking spaces. There were about 74 million boardings on RTD's fixed route bus system in 2015.

### RTD Bus Rapid Transit

The term Bus Rapid Transit (BRT) is not easy to define. It refers to a variety of operational service, and technology characteristics that enable greatly improved bus service. RTD currently operates bus service in several corridors that include BRT features. Examples include the 16th Street MallRide in exclusive Right of Way, bus routes in designated lanes on Broadway and Lincoln with signal priority, and as of January 2016, Flatiron Flyer BRT service between Boulder and Denver in managed lanes along U.S. 36 and I-25.

### RTD Call-n-Ride

RTD's Call-n-Ride offer demand response service available to the general public within a defined service area. This service generally operates in more suburban settings. Customers call to reserve a trip within each Call-n-Ride service boundary. RTD offers subscription service for Call-n-Ride. Select Call-n-Ride service areas offer flex route service. The flex routes offer commuters a reservation-free ride during morning and evening rush-hours at scheduled stops and times along the route. There were over a half million Call-n-Ride boardings in 2014.

### Other Fixed Route

**Black Hawk & Central City Tramway**

Black Hawk Tramway connects major destinations in Black Hawk and Central City seven days a week. The free service is supported by the Black Hawk casinos and Central City. There are about a quarter million boardings on this service annually.

**Boulder Community Transit Network**

The Boulder Community Transit Network is a network of bus routes throughout Boulder and connecting to surrounding cities and RTD's regional routes. The network has 10 bus routes: HOP, SKIP, JUMP, LONG JUMP, BOUND, STAMPEDE, DASH, BOLT, CLIMB, and H2C (Hop to Chautauqua, summer only). All routes are part of the RTD system and are operated by RTD except the HOP and H2C, which are operated by Via Mobility Services.

**Clear Creek Prospector**

The Clear Creek Prospector is a new (late 2016) deviated fixed route service in Clear Creek County serving Georgetown and Idaho Springs. This service is funded with FTA 5311 and local dollars.

**Englewood Art Shuttle**

The City of Englewood provides a free circulator shuttle with 19 stops between the Englewood light rail station, downtown Englewood, and several hospital and medical buildings. Englewood contracts with RTD to operate the service, which operates every 15 minutes on weekdays between 6:30 a.m. and 6:30 p.m.

**University of Colorado at Boulder (Buff Bus)**

The Buff Bus is a transportation service for students living in residence halls. The shuttle connects students with the Main Campus when classes are in session.

**Lone Tree Link**

The Lone Tree Link (initiated in 2014) is a free shuttle service connecting major employment centers along Park Meadows Drive with restaurants, retail, and the RTD system. The Link is funded through a public private partnership of employers and local government.

### Intercity and Regional Bus

Other regional and intercity transit services include Amtrak service, Greyhound, CDOT's Bustang service, and other intercity bus service. Intercity and regional buses link the DRCOG region to the rest of the state and beyond.

## C. RTD Rail

There were over 25 million boardings on RTD's rail system in 2015. Therefore, ridership numbers do not reflect future lines. Note that several lines openings in 2016 and 2017.

**Figure 4: FasTracks Map**

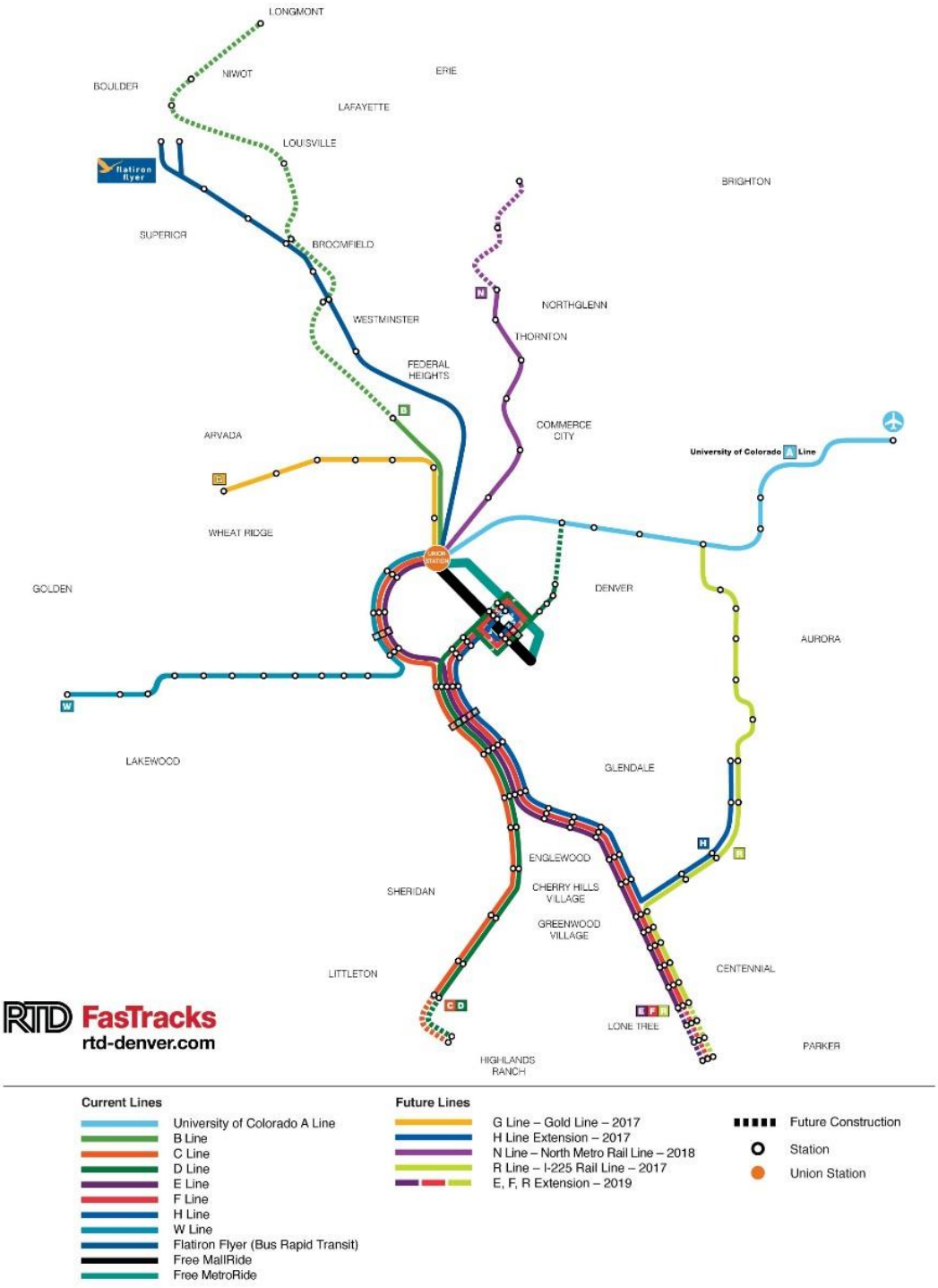



Figure 5 shows RTD's existing and future rapid transit (rail and bus) routes that are part of FasTracks along with the rest of the rapid transit system.

## D. Intermodal Facilities

### Denver Union Station (DUS)

At the heart of RTD's bus and rail network is Denver Union Station (DUS). DUS is a major intermodal passenger terminal connecting commuter rail, light rail, Amtrak, RTD buses, intercity buses, cars, taxis, trucks, bicyclists, and pedestrians.

### Other Major Facilities

Several Park-n-Ride lots and transit stations exist for people to access transit via car, walking, or bicycling. Examples of stations serving as key transfer points include the following:

- Civic Center Station
- Boulder Transit Center and Boulder Junction
- Peoria Station
- I-25 and Broadway
- An additional 70+ Park-and-Ride lots spread across the region

## E. Paratransit, Human Service Transportation, and Other Services

### RTD Paratransit (Access-a-Ride)

Under the Americans with Disabilities Act (ADA), transit agencies must provide complementary transportation services for people with disabilities who are unable to use fixed route bus or rail services. ADA complementary paratransit service must be provided within three quarters of a mile of a bus route or rail station, at the same hours and days, for not greater than twice the regular fixed route fare. RTD's service is branded as Access-a-Ride. Under contract with RTD, Easter Seals evaluates potential clients to determine ADA eligibility. Access-a-Ride provided almost 900,000 boardings in 2015, an increase of over 25% from 2014.

### Other Human Service Transportation

Several agencies provide human service transportation throughout the region. Many offer services that go beyond the requirements of ADA:  door-through-door services and in areas not covered by paratransit. Human service transportation includes specialized services for older adults and individuals with disabilities. It can also include services for persons with low-income offered in areas where there is limited or no fixed route services. Major providers of human service transportation in the region include

Via Mobility Services, Seniors' Resource Center (SRC), and Douglas County (contracts with multiple providers).

Via Mobility Services is a private, non-profit agency that offers a variety of transportation services. Their portfolio includes demand responsive and deviated fixed route. Via's transportation services operate in 19 communities in five counties, including Boulder and Boulder County, Brighton, rural Adams and Arapahoe Counties (Watkins, Strasburg, Bennett, Byers, and Deer Trail), and other communities. Via also conducts travel training: a comprehensive, intensive instruction designed to teach participants how to travel safely and independently on general public transportation.

Seniors Resource Center is also a private, non-profit agency that provides human service transportation among other services. Seniors Resource Center directly transports and/or brokers transportation in multiple counties: Adams, Arapahoe, Broomfield, Denver, Douglas, Jefferson, Clear Creek, Gilpin, and Park. Seniors Resource Center also operates A-Lift transportation via contract with Adams County for county residents who are 60+ or are mobility challenged, regardless of age.

Douglas County contracts with a wide range of providers in a brokerage model for transportation for older adults, individuals with disabilities, and low-income individuals. Contracted providers include

- Castle Rock and Parker Senior centers;
- Love, INC of Littleton, and Neighbor Network volunteer driver programs;
- Seniors Resource Center, and
- To the Rescue.

Each entity (Via Mobility Services, Seniors Resource Center, and Douglas County) integrates FTA 5310 funding, federal Older Americans Act funding, other federal funds, local funds, and other sources to pay for services.

A recent DRMAC study (Transportation Coordination Systems) notes the "region appears to be divided into three or four natural sub-regions: Boulder County, Denver metro and environs (Jefferson County, Broomfield, Adams, Denver, and Arapahoe counties), and Douglas County." Each sub-region has a primary human service transportation agency that directly provides and brokers trips with other smaller providers.

Other agencies that receive or recently received federal funding to provide human service transportation include but are not limited to

- City and County of Broomfield (Broomfield Easy Ride)
- Lakewood Rides
- Developmental Pathways
- Developmental Disabilities Center (Imagine!)
- Easter Seals Colorado
- Boulder County

In addition, the following agencies provide human service transportation and are members of DRMAC:

- Amazing Wheels
- Boulder County CareConnect
- Colorado Cab Company
- First Transit
- Littleton Omnibus and Shopping Cart
- Metro Taxi and South Suburban Taxi
- Town of Castle Rock

It is important to note that the list of providers currently receiving or potentially eligible to receive federal funding to provide human service transportation is always changing. This is because federal eligibility requirements change and because providers evolve over time. The Colorado Association of Transit Agencies maintains a database of transit agencies in the Denver region and across the state. DRMAC maintains a web-based interactive tool to help connect clients with service providers, called *Transit Options*. DRMAC also regularly publishes the Getting there Guide which lists transportation providers and resources.

**Volunteer Drivers**

A significant portion of trips for the population dependent on transit are provided by volunteer drivers. Volunteer drivers include friends, neighbors, and relatives providing transportation in informal arrangements (such as taking a home-bound neighbor to a doctor appointment). It also includes formalized volunteer driver programs. Seniors Resource Center, Via Mobility Services, Douglas County, and others also coordinate volunteer driver programs with their other services. They often reimburse volunteer driver mileage with grant funding through programs like FTA 5310.

## F. Other Transit Services

**Gilpin Connect**

Gilpin Connect is a demand response service for people to access health care and other destinations outside of Gilpin County. This service is funded by gaming revenues.

**Taxi Cabs**

Taxi services play an important role in the provision of transit in the DRCOG region. This includes RTD's Access-a-Cab program and job access taxi voucher programs. Access-a-Cab is offered to current eligible Access-a-Ride customers as an alternative. Access-a-Cab does not meet the requirements for complementary paratransit service under the ADA and is not meant to replace the Access-a-Ride program. However, Access-a-Cab provides a more flexible schedule and is often less costly to RTD and the user. Douglas County and the Town of Castle Rock offer employment access trips using a taxi voucher program. This offers people who live or work where RTD service is limited or unavailable a way to get to and from work.

**Transportation Network Companies**

Transportation Network Companies like Uber and Lyft supply prearranged transportation services for a fee using an online-enabled application or platform to connect drivers using their personal vehicles with passengers. In August 2016, the City of Centennial teamed up with Lyft to offer free rides to and from the Dry Creek light-rail station. Users can get order a ride by going through the Go Centennial mobile app. Recently, Uber gave customers the option to summon self-driving cars from their phones in downtown Pittsburgh. Depending on the success of this pilot program, there may be expansion to other cities in the near future. This could be a new way for transit riders to travel the first and final mile. The State Public Utilities Commission regulates.

**Other Operators**

Several private operators offer transportation for recreational travelers to the mountains. Many ski resorts have shuttle services for their employees. Additionally, many private operators provide rides to ski areas. Multiple providers offer bus service from the metro area to the casinos in Black Hawk and Central City; scheduled trips are made daily to the gaming communities. Super Shuttle and other airport shuttles provide service to and from Denver International Airport. offers shuttle service from the airport to mountain resorts. There are also shuttles that provide transportation to trailheads. Boulder County began the Hessie Trailhead shuttle program in the summer of 2012 to address issues of vehicles that were parking and traffic becoming congested on the way to the trailhead.

# Section III: Funding and Coordination

Funding for transit is complex. The US Department of Health and Human Services has conducted two inventories to ascertain how many federal programs provide funding that can be used for public transportation. The most recent inventory found 70 programs across 14 federal departments or independent agencies. This section provides an overview of local, state, and federal transit funding sources and how they are used in the DRCOG region.

Table 1 shows the major federal and state transit funding programs, and the typical annual allocation from each program for the DRCOG region. Each funding program is described in more detail later in this chapter. The region receives about $73 million annually through federal allocations. Transit agencies and providers in the region are eligible to compete for a portion of another $27 million annually in federal and state funds that are competitively awarded statewide. The largest single federal funding source is the FTA 5307 program, which funds capital and operating assistance in urbanized areas; RTD directly receives FTA 5307 funds as an annual formula allocation.

Transit funds can be categorized in three broad terms:

- *How the funds are distributed*: Federal and state transit funding is provided either directly through a specific allocation, such as through formula funding programs (FTA 5307, 5310, etc.), or is awarded competitively through a merit-based program (such as CDOT's FASTER transit program). In a complicated twist, formula funding programs can also be competitive. For example, the DRCOG region has a history of awarding FTA 5310 funds competitively. Conversely, competitive funds can be awarded by formula – RTD directly receives $3 million annually from CDOT's FASTER transit program and is eligible to compete for additional FASTER transit funds.

- *Where/how the funds can be spent*: All transit funds have some restrictions on eligible activities, and many come with geographic restrictions. For example, the DRCOG region's FTA 5310 large urban funds can be spent only on specific eligible activities in the Denver-Aurora urbanized area.

- *Who controls the allocation of funds to specific projects/services*: RTD directly receives FTA 5307 funds from FTA. It also controls FTA 5307 funds for the small urban areas in the DRCOG region. In contrast, FTA 5310 large urban funds for the Denver region are currently allocated by CDOT, but must be spent within the Denver-Aurora Urbanized Area. And while RTD receives FTA 5307

funds directly, CDOT competitively awards FTA 5311 rural and FTA 5310 small urban funds statewide.

Table 1 shows major transit funding sources and estimated amounts for the DRCOG region. It includes grants, fare box, and RTD's sales and use tax. In addition, forecasted future RTD revenues are also included.

**Table 1: Estimated DRCOG Region Annual Transit Funding Amounts (Rounded Millions)**

| **Annual FTA Formula Funding and FASTER Set-asides for DRCOG Region** | |
|---|---|
| Program | Estimated Annual Allocation |
| FTA 5307 for Denver-Aurora Urbanized Area | $48 |
| FTA 5307 for Boulder Urbanized Area | $3.4 |
| FTA 5307 for Lafayette-Louisville-Erie Urbanized Area | $1.1 |
| FTA 5307 for Longmont Urbanized Area | $2.3 |
| FTA 5310 for Denver-Aurora Urbanized Area | $1.6 |
| FTA 5337 High Intensity Fixed Guideway State of Good Repair for Denver-Aurora Urbanized Area | $8 |
| FTA 5337 High Intensity Motorbus State of Good Repair for Denver-Aurora Urbanized Area | $.8 |
| FTA 5339 for Denver- Aurora Urbanized Area | $4.5 |
| FASTER Set-aside for RTD | $3 |
| **Total** | **$72.7** |

| **FTA and FASTER Funding Controlled by CDOT (projects in DRCOG region may be eligible to compete)** | |
|---|---|
| Program | Estimated Annual Allocation |
| FTA 5310 for Urbanized Areas under 50,000 population | $.55 |
| FTA 5310 for Urbanized Areas 50,000 to 199,999 population | $.97 |
| FTA 5311 for the entire state | $11 |
| FTA 5339 for Urbanized Areas under 50,000 population | $1.3 |
| FTA 5339 for Urbanized Areas 50,000 to 199,999 population | $1.2 |
| FASTER Statewide and Regional Pool[4] | $4 |
| FASTER Local Pool | $5 |
| **Total** | **$24.02** |

[4] RTD and Bustang each receive a $3 million set aside from FASTER Statewide and Regional pool annually. These set asides have been subtracted from the total.

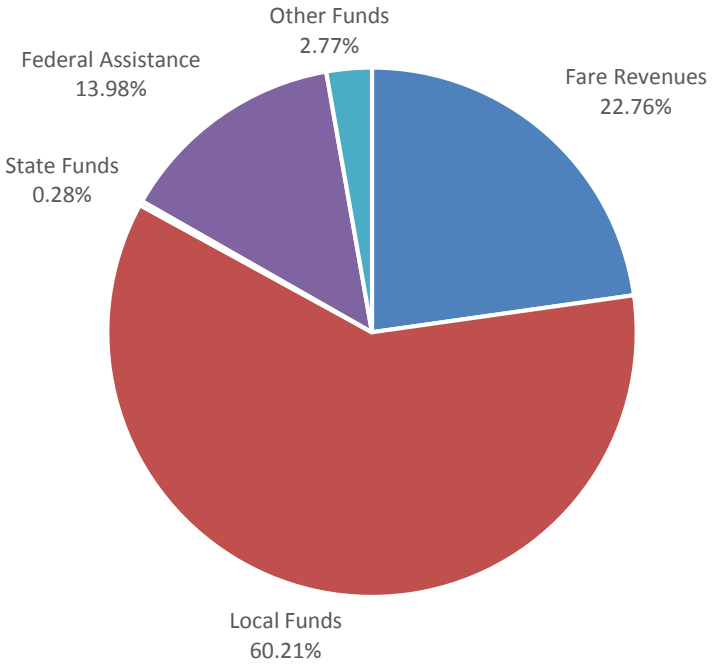
| 2015 RTD Revenue (non-grant) | |
|---|---|
| Fare Box | $119.3 |
| Sales and Use Tax (FasTracks + Base System) | $330.8 |
| Other Income | $ 8.1 |
| **Total** | **$458.2** |

| RTD Forecasted Major Revenue Sources (non-grant)<br>Rounded Millions | | | | | | |
|---|---|---|---|---|---|---|
| | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** |
| Fare Box | $131.3 | $131.3 | $131.3 | $144.4 | $144.4 | $144.4 |
| Sales and Use Tax | $346.8 | $370.5 | $390.8 | $405.6 | $418.6 | $433.2 |
| Other Income | $ 8.3 | $ 8.6 | $ 8.9 | $ 9.1 | $ 9.4 | $ 9.6 |
| **Totals** | **$486.4** | **$510.4** | **$531** | **$559.1** | **$572.4** | **$587.2** |

Adopted from *Regional Transportation District Strategic Budget Plan Cash Flow Base System Capital and Operations 2016-2021*

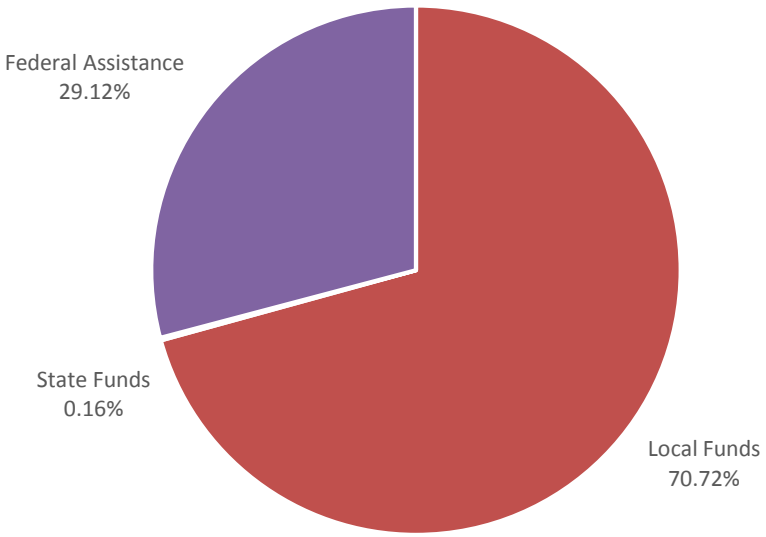
Tables 6 and 7 show the distribution of sources for RTD operating and capital funds. It is interesting to note that local funds make up the majority of funding for both operating and capital. Further, because of federal rules pertaining to how federal funding can be used in large urbanized areas federal assistance makes up a greater share of capital funding than operating for RTD. It is important to note that Figure 7 includes a portion of the New Starts grant for the Eagle P3 Project and, therefore, not fully representative of a typical year.

**Figure 5: Sources for RTD Operating Funds**




*Source: National Transit Database- Denver Regional Transportation District 2014 Annual Agency Profile*

**Figure 6: Sources for RTD Capital Funds**




*Source: National Transit Database- Denver Regional Transportation District 2014 Annual Agency Profile*

## A. Human Service Transportation

Human service transportation includes a broad range of service options designed to meet the needs of the transportation disadvantaged, including persons with disabilities, low income individuals, and older adults. These individuals have different needs and require a variety of transportation services to ensure quality of life. Typically, these services are separate from those available to the general public and are often available only to qualified persons based age, disability, and income. Key funding sources are described below.

### Local Entities

Municipalities, counties, non-profits, and other local entities typically contribute towards the cost of providing human service transportation. Many state and federal grants require a local match. Local project sponsors can provide matching funds or may choose to contribute resources above and beyond grant requirements. Some local services are provided solely with local funds, forgoing state and federal grants. Fares and donations also make up an important part of local funding.

### FTA Section 5310 (Enhanced Mobility for Seniors and Individuals with Disabilities)

The FTA 5310 program funds transportation for older adults and individuals with disabilities. In the DRCOG region, project funding decisions are currently made by CDOT through a competitive funding process in consultation with DRCOG and other stakeholders. FTA has the following specific project-type criteria for allocating 5310 funds:

- *At least 55% of program funds must be used on capital or "traditional" 5310 projects. Examples include:*
    - *Buses and vans; wheelchair lifts, ramps, and securement devices; transit-related information technology systems including scheduling/routing/one-call systems; and mobility management programs.*
    - *Acquisition of transportation services under a contract, lease, or other arrangement. Both capital and operating costs associated with contracted service are eligible capital expenses. User-side subsidies are considered one form of eligible arrangement.*
- *The remaining 45% is for projects formerly allowed under the 5317 New Freedom program. Capital and operating expenses for new public transportation services and alternatives beyond those required by the ADA, designed to assist individuals with disabilities and older adults are eligible under this category. Examples include:*
    - *Travel training; volunteer driver programs; building an accessible path to a bus stop including curb-cuts, sidewalks, accessible pedestrian signals or other accessible features; improving signage, or way-finding technology; incremental cost of providing same day service or door-to-door service; purchasing vehicles to support new accessible taxi, rides sharing and/or vanpooling programs.*
- *Mobility Management is an allowable expense in both categories.*

Table 2 shows the most recent FTA 5310 awards.

**Table 2: Federal Fiscal Year 2016-17 5310 Awards in the DRCOG Region**

| Sponsor | Project | Award |
|---|---|---|
| Via | Call Center Operating | $270,225 |
| Via | Mobility Management (Travel Training, MM) | $300,000 |
| Seniors' Resource Center | Operational Support | $250,000 |
| Denver Regional Mobility and Access Council (DRMAC) | Regional Mobility Management | $200,000 |
| Douglas County | 5310 Mobility Management | $109,000 |
| Douglas County | 5310 Capital Operating | $176,000 |
| Seniors' Resource Center | Brokerage/Mobility Management | $230,000 |
| Via | Section 5310: Mobility Management - Travel Training | $200,000 |
| Via Mobility Services | Replace Three Body-on-Chassis Paratransit Buses | $45,200 |
| Via Mobility Services | Replace Three Body-on-Chassis Paratransit Buses | $45,200 |
| Via Mobility Services | Rebuild Three Body-on-Chassis Paratransit Buses | $9,120 |
| Via Mobility Services | Replace Three Body-on-Chassis Paratransit Buses | $45,200 |
| Via Mobility Services | Via Mobility Services Rebuild Three Body-on-Chassis Paratransit Buses | $9,120 |
| Via Mobility Services | Rebuild Three Body-on-Chassis Paratransit Buses | $9,120 |
| Via Mobility Services | Rebuild One Paratransit Van | $9,120 |
| Seniors Resource Center | Seniors Resource Center (Adams) A-Lift Fleet Replacements | $128,000 |
| Seniors Resource Center | SRC Fleet Vehicle Replacements | $120,000 |
| Easter Seals Colorado | Body on Chassis Replacement | $50,440 |

*Sources: CDOT- Final FY17 FASTER and FY16 FTA Awards List 2-25-16 & 2016-2017 Awards for Administration, Operating, and Capitalized Operating Programs*

### Area Agencies on Aging (Older Americans Act Funding)

Area Agencies on Aging (AAA) were established under the Older Americans Act of 1965 to respond to the needs of Americans 60 plus years of age. The DRCOG AAA covers the DRCOG region except for Boulder and southwest Weld Counties, who each have county-run AAAs. The Boulder County AAA is a division of the Boulder County Community Services Department. The Weld County AAA is the County's Department of Human Services.

All three AAAs administer Title III Federal Older Americans Act and Older Coloradans Act State funding. A significant portion is available for transportation for adults over the age of 60. The DRCOG AAA contracts with counties and transportation agencies in the DRCOG region for transportation. The Boulder and Weld County AAAs manage Older Americans Act transportation funding in their counties.

### Medicaid – Non-Emergent (Emergency) Medical Transportation (NEMT)

Non-Emergent Medical Transportation is for Medicaid clients with no other means of transportation to and from Medicaid medical appointments. In addition to directly paying for transportation, reimbursement also may be given for gas, bus tokens, and bus passes.

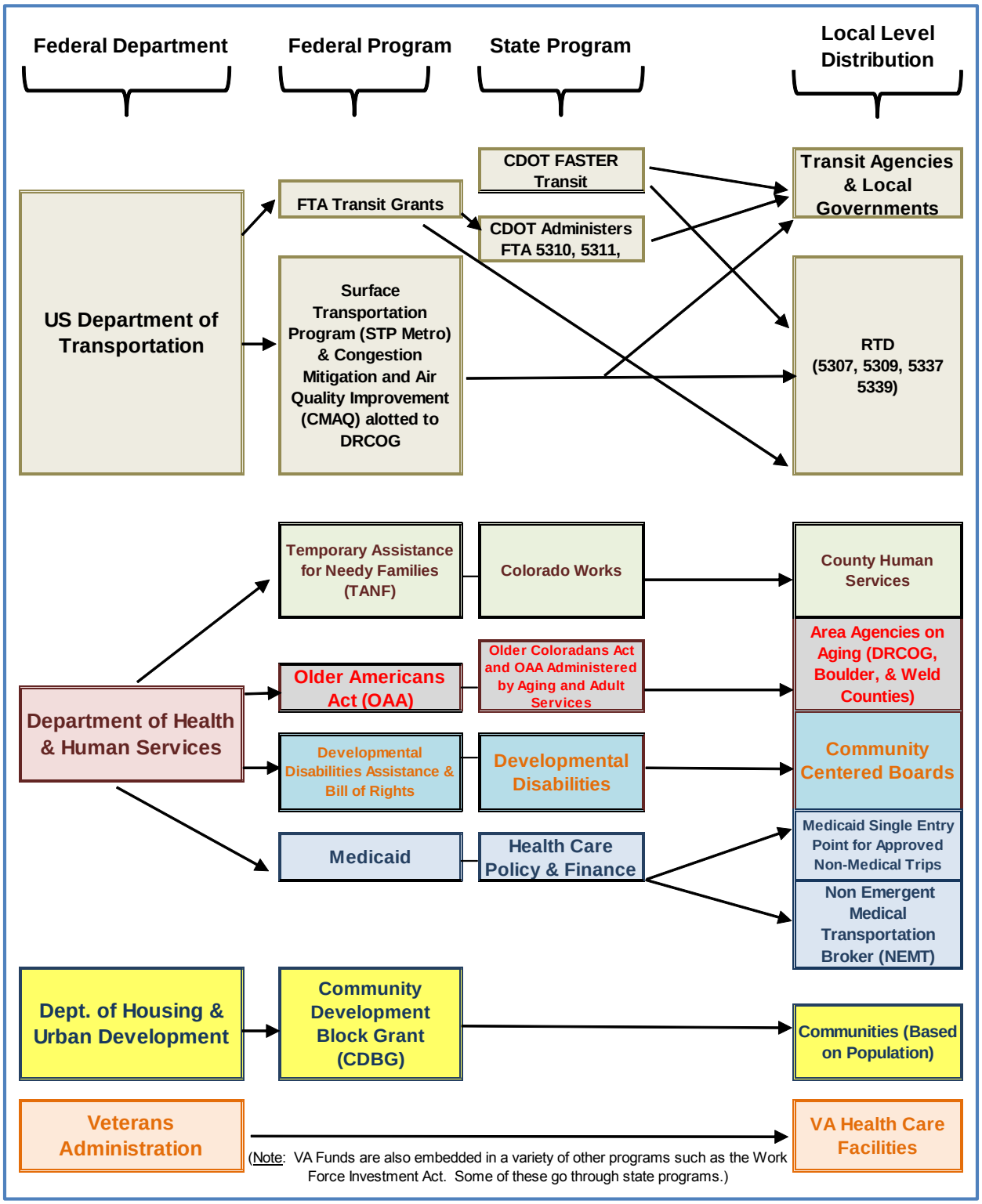
In the DRCOG region, the Colorado Department of Health Care Policy and Financing contracts with a private company to broker this service. This contract covers Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld counties. In Gilpin County Non-Emergent Medical Transportation is arranged through the Department of Human Services. In Clear Creek County, Seniors Resource Center, through its Evergreen operation, provides Non-Emergent Medical Transportation as part of their overall transportation contract with the County.

### Coordination of Funding Sources for Human Services Transportation

Figure 8 paints a broad – but simplified – picture of funding sources for transit in the DRCOG region. It shows key federal funding sources, where they come from, and how they are distributed from the federal to the local level. However, it is not an exhaustive list. For example, many local sources of funding are not included, such as RTD's sales and use tax revenue.

**Figure 7: Schematic of Federal Funding Sources, Distributers, & Recipients**

## Schematic of Federal & State Funding Sources, Distributers, and Recipients



It is important to emphasize the FTA allows non-USDOT federal funds to be used toward the required local match for FTA grants in many circumstances. Of significance to the DRCOG region is the ability to use Older Americans Act funds as local match for FTA funds. In the October 16, 2012 Federal Register in the 5310 Section under the subheading of "Local Match" it states the following:

> ***"Funds provided under other Federal programs (other than those of the Department of Transportation, with the exception of the Federal Lands Transportation Program and Tribal Transportation Program established by sections 202 and 203 of title 23 U.S.C.) may be used for local match for funds provided under section 5310, and revenue from service contracts may be used as local match."***

Figure 9 is federal policy guidance on mixing federal and local transportation funds. Mixing of eligible funds is encouraged by the federal government, and is a key strategy identified in Section VI to improve human service transportation. Mixing of funding could also help breakdown silos and increase access to transportation for purposes outside specific funding sources such as medical trips.

## Figure 8: Policy Statement Summary on Resource Sharing from the Federal Interagency Coordinating Council on Access & Mobility

Background:

Often Federal grantees at the State and local levels restrict transportation services funded by a Federal program to clients or beneficiaries of that Federal program. Some grantees do not permit vehicles and rides to be shared with other federally-assisted program clients or other members of the riding public. Federal grantees may attribute such restrictions to Federal requirements. This view is a misconception of Federal intent.

Purpose:

This policy guidance clarifies that Federal cost principles do not restrict grantees to serving only their own clients. To the contrary, applicable cost principles enable grantees to share the use of their own vehicles if the cost of providing transportation to the community is also shared. This maximizes the use of all available transportation vehicles and facilitates access for persons with disabilities, persons with low income, children, and senior citizens to community and medical services, employment and training opportunities, and other necessary services.

Applicable Programs:

This policy guidance applies to Federal programs that allow funds to be used for transportation services. This guidance pertains to Federal program grantees that either directly operate transportation services or procure transportation services for or on behalf of their clientele.

### Federal Cost Principles Permit Sharing Transportation Service:

A basic rule of appropriations law is that program funds must only be used for the purposes intended. Therefore, if an allowable use of a program's funds includes the provision of transportation services, then that Federal program may share transportation costs with other Federal programs and/or community organizations that also allow funds to be used for transportation services, as long as the programs follow appropriate cost allocation principles.

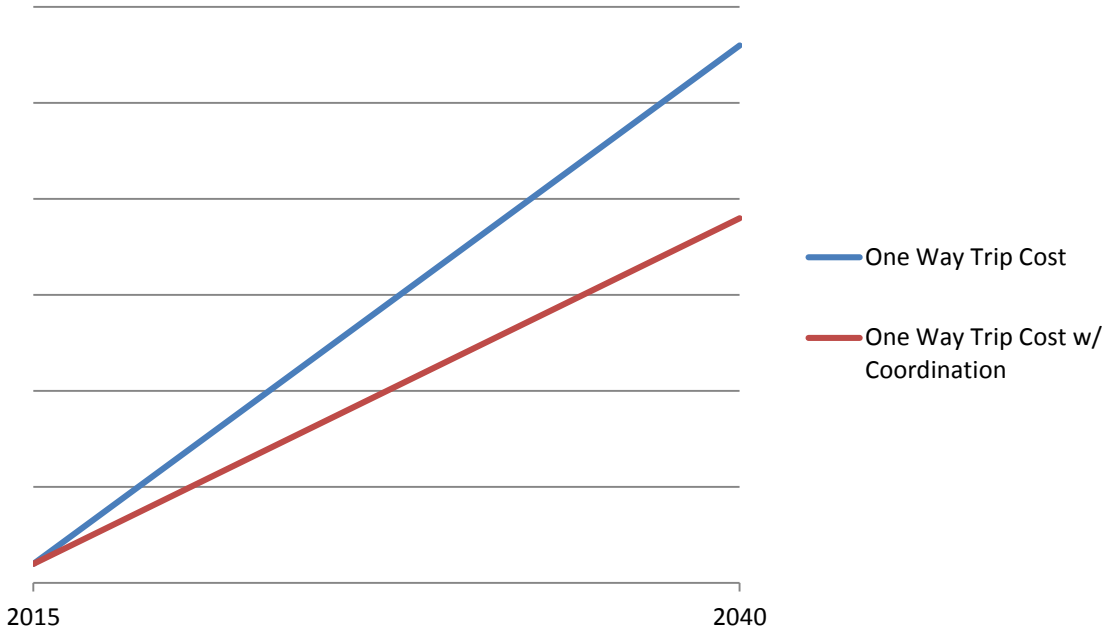
None of the standard financial principles expressed in any of the OMB circulars or associated Federal agency implementing regulations preclude vehicle resource sharing, unless the Federal program's own statutory or regulatory provisions restrict or prohibit using program funds for transportation services. For example, one common financial rule states the following. "The grantee or sub grantee shall also make equipment available for use on other projects or programs currently or previously supported by the Federal Government, providing that such use will not interfere with the work on the project or program for which it was originally acquired. First preference for other use shall be given to other programs or projects supported by the awarding agency. User fees should be considered if appropriate."

In summary, allowability of costs is determined in accordance with applicable Federal program statutory and regulatory provisions and the cost principles in the OMB Circular that applies to the entity incurring the costs. Federal cost principles allow programs to share costs with other programs and organizations. Program costs must be reasonable, necessary, and allocable. Thus, vehicles and transportation resources may be shared among multiple programs, as long as each program pays its allocated (fair) share of costs in accordance with relative benefits received.

**Source: Federal Interagency Coordinating Council on Access and Mobility Final Policy Statement. October 1, 2006**

Figure 10 shows what the impact of successful coordination and travel training efforts could be on meeting transit demand. The increased efficiency that coordination provides could slow the growth of costs. The average cost per passenger trip on human service transportation in the region is around $16[5]. With four percent inflation, the cost could be over $40 per trip in 2040. If coordination reduces the cost by 20%, which is conservative based on United States General Accounting Office findings from several case studies[6], the cost per trip could be around $30. Based on this savings, approximately 55,000 annual additional trips could be provided annually.

**Figure 9: Estimated Cost for Human Service Transportation 2015-2040**




## B. General Public Transportation

General public transportation is not restrictive to the type of user. It can be fixed route or demand responsive. The ADA does require that public transportation be accessible for individuals with disabilities.

[5] *Transportation Coordination Systems Advisor Project Final Report*- Denver Regional Mobility and Access Council

[6] The United States General Accounting Office Report to Congressional Committees- *Transportation Coordination: Benefits and Barriers Exist, and Planning Efforts Progress Slowly*- October 1999 http://www.gao.gov/new.items/rc00001.pdf

## RTD

### Sales and Use Tax

A one penny sales tax within the RTD District helps pay for RTD services: $0.04 funds FasTracks and $0.06 funds RTD's base system (all services excluding FasTracks). This revenue accounts for almost 60 percent of RTD's base system operating budget.

### Fares

Passenger farebox revenues (known as farebox recovery) account for less than 25 percent of RTD's base system operating budget revenue. Farebox recovery is the second-largest source of revenue after the sales and use tax.

## Local Governments

Douglas County, the Town of Parker, and RTD formed a partnership to save RTD's Call-n-Ride service in Parker from elimination. The agreement includes financial and in-kind contributions from Douglas County and the Town of Parker in order to fund the service, and an agreement to collaborate to improve and promote the service to grow ridership.

The Longmont Free Fare Pilot Program provides free rides on local Longmont bus service. This program is managed and paid for by Boulder County and the City of Longmont, through grants and the voter-approved Transit and Trails sales tax. The program is designed to benefit low income residents and increase ridership on the local Longmont transit routes. Some communities, such as Boulder, also fund buy-ups of RTD service to provide more service (such as better headways) than what RTD can afford on a particular route.

## State

### FASTER Transit

The Funding Advancements for Surface Transportation and Economic Recovery Act of 2009 (FASTER) provides $15 million annually to transit projects. Of this total, $5 million is competitively awarded to "local" projects and $10 million to state and regional projects. RTD and Bustang each receive a $3 million set-aside from the state-wide and regional pool. FASTER is for capital projects only, with the exception of the set-aside for Bustang and a small allocation for interregional operating assistance. Table 3 shows the most recent FASTER awards in the DRCOG region. This table includes the RTD $3 million set-aside.

Table 3: State Fiscal Year 2017 FASTER Awards in the DRCOG Region

| Sponsor | Project | Award |
|---|---|---|
| RTD | 19th and California Light Rail Crossing Rehab and Reconstruction | $2,000,000 |
| RTD | Light Rail Midlife Refurbishment and Overhaul (3 vehicles) | $1,000,000 |
| RTD | First and Last Mile Study | $200,000 |
| RTD | Mineral Park n Ride Bridge Rehab | $56,938 |
| RTD | Thornton Park n Ride Passenger Amenities | $308,000 |
| CDOT Region 1 | CDOT Region 1 Bus on Shoulder | $350,000 |

*Source: CDOT- 2016-2017 Awards for Administration, Operating, and Capitalized Operating Programs*

## Federal

### FTA Section 5307 (Urbanized Area Formula Program)

Funds are for urbanized areas with more than 50,000 people. The funding formula takes population and population density into account. This program is generally used for transit capital expenditures, but under certain circumstances, funds may also be used for operating assistance and transportation planning. Additionally, up to 10 percent of formula funds can be used for ADA service. Projects previously eligible under the Section 5316 Job Access Reverse Commute (JARC) program are now eligible under Section 5307. RTD is the Designated Recipient for the Denver-Aurora Urbanized Area. RTD also receives funding for the small urbanized areas within the RTD District: Boulder, Louisville-Lafayette, and Longmont. In total, RTD is allocated about $50 million annually, which it typically uses for vehicle maintenance and procurements.

Pockets of the DRCOG region, mostly in southern Douglas County, were added to the Denver-Aurora Urbanized area based on the 2010 Census, but are outside RTD boundaries. Those communities are eligible to receive this funding through RTD, or become an additional designated recipient.

### Section 5309 (Transit Capital Investment Program)

***Fixed Guideway Capital Investment Grants*** *(New Starts, Small Starts, and Core Capacity)*

This program funds new and expanded rail, bus rapid transit, and ferry systems that reflect local priorities to improve transportation options in key corridors. Eligible projects include:

- New fixed-guideways or extensions to fixed guideways (projects that operate on a separate right-of-way exclusively for public transportation, or that include a rail or a catenary system);
- Bus rapid transit projects operating in mixed traffic that represent a substantial investment in the corridor, and
- Projects that improve capacity on an existing fixed-guideway system.

There are four categories of eligible New Starts projects are new fixed guideway projects or extensions to existing fixed guideway systems with a total estimated capital cost of $300 million or more, or that are seeking $100 million or more in Section 5309 CIG program funds. Small Starts projects are new fixed guideway projects, extensions to existing fixed guideway systems, or corridor-based bus rapid transit projects with a total estimated capital cost of less than $300 million and that are seeking less than $100 million in Section 5309 CIG program funds. Core Capacity projects are substantial corridor-based capital investments in existing fixed guideway systems that increase capacity by at least 10 percent in corridors that are at capacity today or will be in five years. Core capacity projects may not include elements designed to maintain a state of good repair. Programs of Interrelated Projects are comprised of any combination of two or more New Starts, Small Starts, or Core Capacity projects. The projects in the program must have logical connectivity to one another and all must begin construction within a reasonable timeframe.

The Eagle P3 Project (East Rail Line, Gold Line, and Northwest Rail Phase I), the West Rail Line, and the Southeast Extension have received or are in the process of receiving grants from this program, as follows:

- Approximately $1 billion for the Eagle P3 Project
- Approximately $300 million for the West Rail Line
- Approximately $92 million for the Southeast Rail Extension

**Section 5311 (Formula Grants for Rural Areas)**

This program provides capital, operating, and administrative assistance for general public transit in areas with fewer than 50,000 people. Transit services in rural portions of the DRCOG region are eligible; applicants must apply through CDOT. Both Seniors Resource Center and Via Mobility Services have received funding for service in rural parts of the DRCOG region, such as rural Jefferson, Adams, Arapahoe, and Boulder Counties as well as Clear Creek and Gilpin Counties. As with the FTA 5307 program, projects previously eligible under the FTA 5316 JARC program are now eligible under FTA

5311. CDOT coordinates with DRCOG in selecting projects in the DRCOG region. Table 4 shows the most recent FTA 5311 awards.

**Table 4: Federal Fiscal Year 2016 FTA 5311 Awards in the DRCOG Region**

| Sponsor | Project | Award |
|---|---|---|
| Seniors' Resource Center | Rural (SRC-Evergreen) Admin/Ops. Support | $201,880 |
| Seniors' Resource Center | Rural Clear Creek Transportation | $90,000 |
| Via Mobility Services | Section 5311: Admin/Operating (Rural Services) | $333,380 |

*Sources: CDOT- Final FY17 FASTER and FY16 FTA Awards List 2-25-16 & 2016-2017 Awards for Administration, Operating, and Capitalized Operating Programs*

### Section 5337 (State of Good Repair)

The formula-based State of Good Repair program is FTA's first stand-alone initiative dedicated to repairing and upgrading the nation's rail transit systems and other rapid transit such as BRT. Transit systems in urbanized areas with fixed guideway public transportation facilities operating for at least seven years are eligible. RTD plans to use this funding to upgrade existing rail corridors and the 16th Street Mall.

### Section 5339 (Bus and Bus Facilities Program)

This program allocates capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. RTD receives most of the funds in the DRCOG region and uses them for vehicle purchases and improvements to transit stations.

Under MAP-21 and continued under the FAST Act, the FTA 5339 program replaced the portion of the FTA 5309 program that used earmarks for distributing bus and bus facility capital funds. Colorado previously submitted one unified FTA 5309 application, and earmarks typically totaled about $8-13 million annually. This program now distributes funds to states on a formula basis. Colorado receives about $1.75 million for small urban and rural areas. The three large urbanized areas (Denver-Aurora, Colorado Springs, Fort Collins-Loveland) each receive their own formula funding. RTD receives about $3 million annually for the Denver-Aurora urbanized area.

### Public Private Partnerships

RTD pioneered efforts to generate revenue for FasTracks through public private partnerships. The Eagle P3 project is a nationally-renowned example of a public private partnership. RTD contracts with a concessionaire selected through a competitive process to design, build, finance, operate, and maintain the Eagle project, with RTD making an annual payment to the concessionaire. This allows RTD to spread out large upfront costs over approximately 30 years. The Eagle project is comprised of RTD's East Rail Line, Gold Line, Commuter Rail Maintenance Facility and Northwest Rail Line Westminster segment. Other FasTracks projects that use public private partnerships are North Metro, Southeast Extension, and U.S. 36.

At the local level, the Lone Tree Link, mentioned in Section II, is funded through a public private partnership of businesses, non-profits, and local government.

# Section IV: Demographics and Forecasted Growth

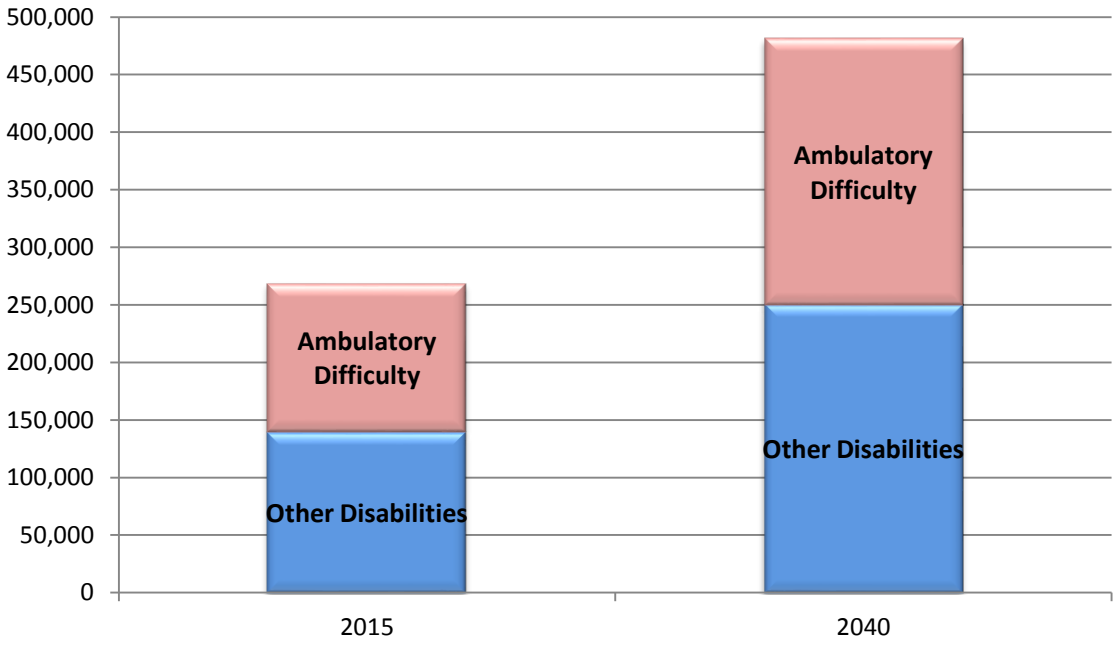
DRCOG staff forecasted the growth for major populations groups that may be more likely than the general public to need and use transit services in the future. The population groups identified are: individuals with disabilities, older adults, youth, zero car households, low income, minority, and limited English proficiency. Each group is analyzed separately with acknowledgement of overlap between groups (such as a disabled older adult without access to a car).

## A. Individuals with Disabilities

Individuals with disabilities often lack transportation options. Many rely on public transit, human service transportation, or other means to fulfill activities of daily living. The ADA requires public transportation to be accessible and complementary paratransit to be available for individuals with disabilities when barriers prevent them from riding fixed route.

The most recent five-year estimate from the American Community Survey (2010-2014) shows the noninstitutionalized population for individuals with disabilities in the DRCOG region is almost 270,000, or roughly 9% of the region's total population. About one-third of all people in the Denver region older than 65 have a disability compared to about 6% for the population under 65. If the proportion of persons with a disability in each age group remains the same, by 2040 the region could have over 480,000 persons with a disability. This data is shown in Figure 11.

**Figure 10: Individuals with Disabilities in the DRCOG Region**




*Sources: 2015 – Colorado Demography Office; 2040 – DRCOG Forecast with proportional increase by age group; American Community Survey (2010-2014)*

In 2008, the US Census Bureau introduced new questions related to disabilities. These new questions enable the Census to classify the following disability types:

- Hearing difficulty
- Vision difficulty
- Cognitive difficulty
- Ambulatory difficulty
- Self-care difficulty
- Independent living difficulty

Table 3 shows the estimated population in the DRCOG region by disability type.

**Table 5: Estimated Population in the DRCOG Region by Disability Type**

| Disability Type | Total |
|---|---|
| With a hearing difficulty | 92,134 |
| With a vision difficulty | 52,471 |
| With a cognitive difficulty | 65,446 |
| With an ambulatory difficulty | 133,111 |
| With an independent living difficulty | 91,675 |
| With a self-care difficulty | 50,724 |
| **Total** persons with a disability<br>(not equal the sum of all disability types because some have more than one disability) | **485,561** |

*Source: 2009-2013 American Community Survey 5-Year Estimates*

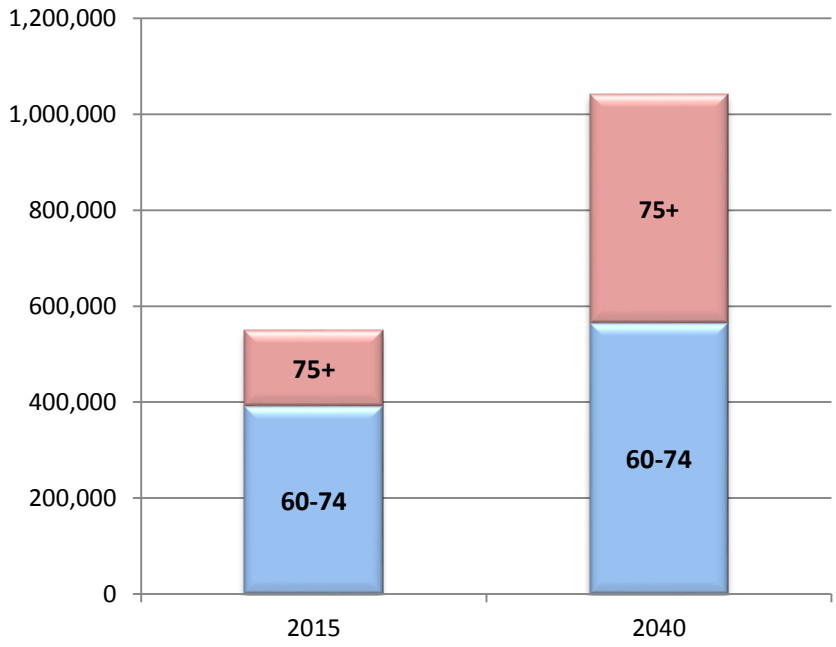
Table 5 shows disability types by age group in the DRCOG region. The number of people within disability categories is roughly the same in both the 18-64 and 65+ age groups.

## B. Older Adults

Many older adults are reluctant to stop driving for fear of losing their independence. Like individuals with disabilities, many older adults that do not drive rely on public transportation and other means to maintain their independence.

The older adult population is increasing much faster than the general population. While the 60+ population is expected to almost double, the population under 60 is expected to grow by roughly a third. As shown in Figure 12, more than a half million residents in the DRCOG region are currently 60 years old or older. Between 2010 and 2015, this group grew by 27 percent as Baby Boomers, born between 1946 and 1964, entered this age group. The 60 plus population in the region is anticipated to increase to over one million by 2040. By then, one in four persons in the region will be over the age of 60. Further, the population of adults age 75 and older is forecast to be 476,000 by 2040, an increase of about 200 percent from 2015.

**Figure 11: Forecast Growth of Age 60+ Population in the DRCOG Region**




*Sources: 2015 – Colorado Demography Office; 2040 – DRCOG Forecast*

**2013 RTD Paratransit Survey Demographic Profile**

A recent survey of paratransit users was conducted by RTD. The following demographic information obtained is noteworthy for planning purposes:

- RTD paratransit customers tend to be older than users of other RTD service types, with 56% of Access-a-Ride customers and 59% of Access-a-Cab customers are 65 years of age or older, compared to 7% for fixed route riders.
- RTD's paratransit services frequently provide transportation for low income populations. About 50% of Access-a-Ride and 60% of Access-a-Cab customers report household incomes of less than $15,000 per year, compared to about 26% for fixed route riders.
- Paratransit customers tend to have lower education levels when compared to customers using other services. Nearly half of all customers indicated they graduated high school or have less than 12 years of formal education, compared to 28% of fixed route riders.
- About 86% of paratransit customers are retired or are unable to work; about 10% of fixed route riders indicated they are retired or are unable to work.
- Nearly two thirds of Access-a-Ride customers and 80% of Access-a-Cab customers are female.

- 25% of paratransit customers indicated they used a fixed route service in the 12 months preceding the survey.

## C. Youth

Growth is also anticipated for the youth, ages 12-20. High school students receive a discounted rate on RTD buses and often use them to get to and from school. For example, an estimated 2,400 Denver Public high school students use RTD to go to and from school[7]. Between 2015 and 2040, this population is expected to increase by over 20 percent, from approximately 377,000 to 460,000.

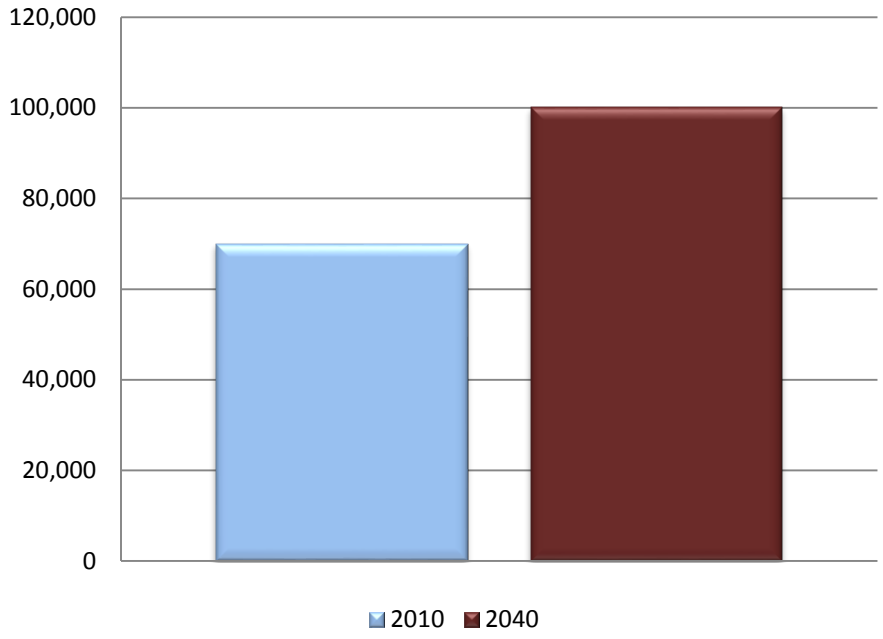
## D. Zero Vehicle Households

Households without a motor vehicle are by definition dependent on modes of transportation other than a privately-owned automobile. These modes include transit, walking, bicycling, taxi, carshare, and others. Many zero vehicle households have no vehicle by choice, while other households cannot afford to purchase and maintain an automobile or do not have a resident legally permitted to drive.

Based on 2010 Census (CTPP) data, about 70,000 households in the DRCOG region have no vehicle available. If this number grows proportionately with the overall population, then there could be almost 100,000 zero-vehicle households by 2040 (Figure 13).

[7] http://www.dpsk12.org/docs/hs_transportation/

**Figure 12: Zero Vehicle Households in the DRCOG Region**

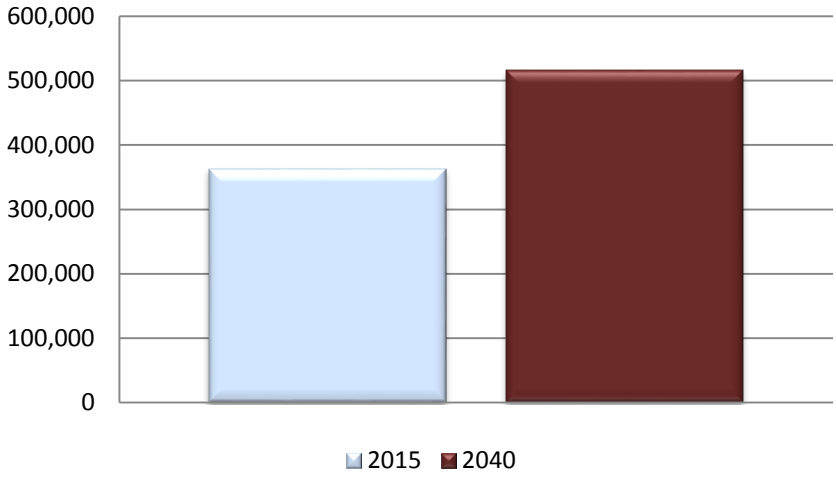



*Source: US Census, 2010 Census Transportation Planning Package proportional increase to 2040*

## E. Low Income Population

The current estimate for population below 100 percent of poverty is 363,000, or about 12 percent of the total population for the DRCOG region. 100 percent of poverty is $11,770 for a one-person household; it is $24,250 for a household of four. If this population is the same proportion of the current total population in 2040, there could be approximately 516,000 low-income individuals in the Denver region (Figure 14).

**Figure 13: Population in Poverty in the DRCOG Region**




*Source: US Census; proportional increase to 2040*

## F. Limited English Proficiency

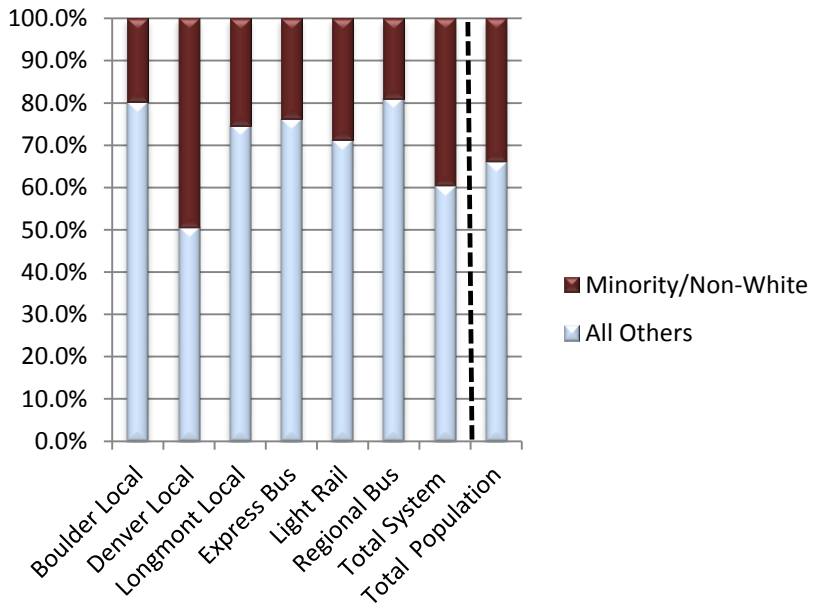
Limited English Proficiency (LEP) refers to a person who is not fluent in the English language, often because it is not their native language. The most common language spoken at home other than English among the LEP population in the DRCOG region is Spanish or Spanish Creole (161,576 or about 6 percent). The population of individuals that speak English less than "very well" increased significantly between 1980 and 2010, a twelve-fold increase. However, recent estimates indicate a downward trend. The American Community Survey 2007-2014 estimate for this population is 217,257, or about 7 percent of the total population. Despite a recent downward trend, there will continue to be transportation need in this community through 2040.

There is also a growing immigrant and refugee population in the DRCOG region. Colorado resettles nearly 2,000 refugees a year; approximately 90% settle in the DRCOG region. These newcomers are given legal and permanent status, work authorization, five years of English classes, and access to public assistance to help them obtain financial self-sufficiency. DRCOG's Elder Refugee Program offers assistance and guidance, including transportation assistance, to refugees who are older adults. In partnership with the Colorado Refugee Service Program and the federal Office of Refugee Resettlement, DRCOG's Elder Refugee Program has created a gathering place for elder refugees to decrease social isolation, increase integration and interaction, and build community connections.

## G. Minority Population

Minorities (non-Caucasian) make up a significant portion of RTD ridership. On many RTD routes, minority ridership is higher than their proportion of the region's total population. RTD conducted a transit ridership demographic comparison for their 2013-2015 Title VI Report. Figure 15, adapted from RTD's report, compares the non-Caucasian population with all others for RTD's bus service categories. RTD condensed the minority definitions used for this specific analysis from the definitions the Census uses.

**Figure 14: 2011 RTD Minority/Caucasian Ridership**




*Source: RTD 2013-2015 Title VI Report and 2010 US Census*

According to Census data, almost 2 million white non-Hispanic residents live in the DRCOG region, or over two thirds of the total population. About 630,000, or almost a quarter of the population, is Hispanic (all races). Applying the state demographer's statewide growth rates to the 2010 DRCOG region population data, the Hispanic (all races) share grows by 9 percent and the white, non-Hispanic share decreases by 13 percent in 2040 (Figures 16 and 17).

**Figure 15: 2010 DRCOG Minority Population**

*Source: Colorado Demography Office*

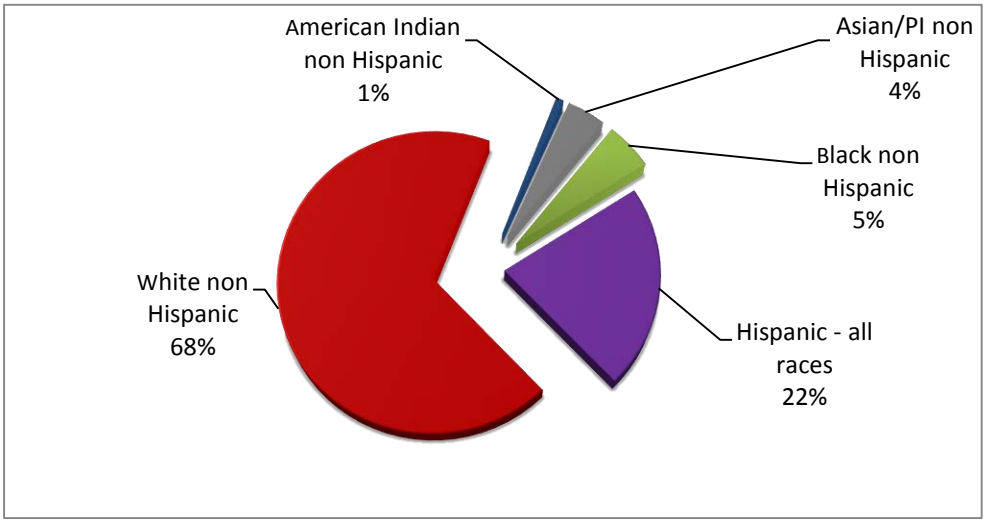
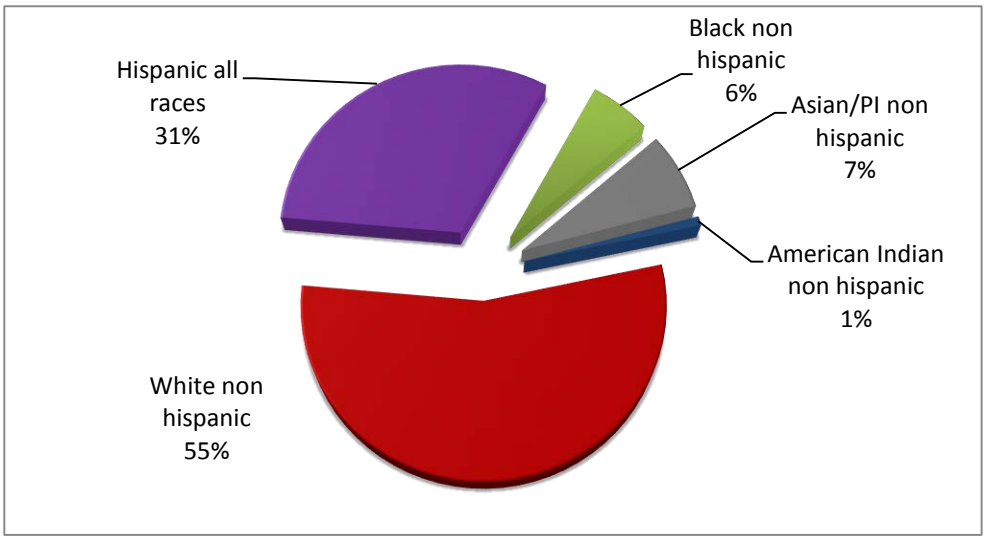



**Figure 16: 2040 Estimated DRCOG Minority Population**




*Source: Colorado Demography Office*

# Section V: Assessment of Transportation Needs

The previous section illustrated in broad terms the potential demand for all types of transit service, particularly human service transportation, by 2040. This section discusses and identifies transit capital, operating, and related needs to assist in responding to the potential demand. FasTracks will help serve this demand, but RTD's base services and service from other agencies must also increase.

## A. Transit Agency Capital and Operating Needs

Based on grant-funded projects and interviews with transportation agencies in the region, over-arching needs include vehicles (replacement and expansion), operating assistance (personnel, drivers, maintenance, fuel, etc.) mobility management, and capital expenditures to keep fleet, facilities, and other key assets in a state of good repair.

In 2013, FTA estimated that, nationwide, more than 40 percent of buses and 25 percent of rail transit assets were in marginal or poor condition. Estimates from the National State of Good Repair Assessment identified an $86 billion backlog in deferred maintenance and replacement needs, a backlog that continues to grow[8]. RTD's State of Good Repair Dashboard indicates a 2014 score of 3.7 for bus vehicle assets and 4.1 (out of 5) for light rail vehicle assets, where a score of 5 is excellent condition.

CDOT has developed a statewide asset inventory database to track transit capital needs and to help inform state and federal grant project funding decisions. The asset inventory database shows that RTD has 89% of vehicles in the DRCOG region (1,023 vehicles). Among other agencies in the region, Via Mobility Services and Seniors Resource Center have the most with 53 and 36 respectively. Transit agencies are also able to use the database to track their capital inventory.

### Access to Employment

Where the Jobs Are: Employer Access to Labor by Transit (Brookings Institution – 2012) combined detailed data on employment, transit systems, and household demographics to determine transit accessibility within and across the country's 100 largest metro areas. The share of jobs in the Denver-Aurora Metropolitan Statistical Area in neighborhoods with transit service is 87%; this ranked 12th among the 100 largest metros. The Brookings study did not take into account time of day. Many low income workers have jobs with nontraditional hours (e.g. evenings and weekends). This coverage is

[8] http://www.fta.dot.gov/13248.html

expected to improve when more FasTracks lines and stations open in the next few years. Despite this, there are still pockets of the region where transit-job access is needed or can be improved.

## B. Human Service Transportation Needs

Human service transportation needs are more complex and are identified from a variety of input sources, including surveys, studies, and public meetings. Stakeholders and the general public contributed significantly to this process. Key input sources and a high-level summary of major needs are listed below.

### Input Sources

- DRCOG and DRMAC Forum
- 2016-2019 DRCOG Area Plan on Aging – Public Input from Community Conversations
- DRCOG Transportation Advisory Committee
- DRCOG AAA Aging Advisory Committee
- County Council on Aging Survey
- Older Americans Act/Older Coloradans Act Transportation Agencies
- CDOT Statewide Transit Survey of Older Adults and Adults with Disabilities
- Local Coordinating Councils (LCCs)
- 2013 RTD Paratransit Customer Satisfaction Survey
- Community Assessment Survey for Older Adults for the DRCOG, Boulder, and Weld AAAs
- United States of Aging Study Oversample of Denver Region
- Community Living Advisory Group to the Governor of Colorado

### Summary of Needs

- Transportation ranked as a top service priority for older adults and individuals with disabilities
- Affordable fares, especially for older adults, individuals with disabilities and/or low incomes
- More cross-jurisdictional trips, better trip coordination, and more accessibility
- Better regional coordination to build on improving local coordination
- Demand for transportation will increase as the population increases and ages
- Expand volunteer driver programs
- Continue to work with DRMAC to implement the Transportation Coordination Systems project and other technological improvements
- Accessible and understandable transportation information and referral services

- Increase service areas, frequency, service hours (nights and weekends) where gaps exist
- Increase transportation options for quality of life trips such as hair appointments and social visits
- Remove barriers to ride fixed route, including improving access to bus stops and rail stations and providing travel training
- Improve access to healthcare for non-emergent visits
- Make sure that veterans have access to transportation

# Section VI: Strategies and Activities to Address Identified Needs & Service Gaps

## A. Future Transit Services

This section identifies strategies and activities to address service gaps between current services and identified needs. Strategies and activities addressed in this section include opportunities to achieve efficiencies in service delivery.

### MVRTP 2040 Fiscally Constrained Rapid Transit System & Base Rapid Transit System

Figure 18 shows the fiscally constrained rapid transit system contained in the Metro Vision Regional Transportation Plan (MVRTP). By definition, revenues needed to complete these improvements are reasonably expected to be available by 2040. The majority of the rapid transit network is open to the public or currently under construction. Two BRT corridors (East Colfax and 119) must secure programmed funding and complete environmental studies before construction can begin.

The Tier 1 Base Rapid Transit System (depicted in Figure 19) is a 269-mile system of light rail, commuter rail, and BRT corridors and bus/HOV facilities that are operating, under construction, or included in FasTracks (see below). Most of Tier 1 is fiscally constrained through 2040, with the exception of some FasTracks projects funded beyond 2040.

### FasTracks

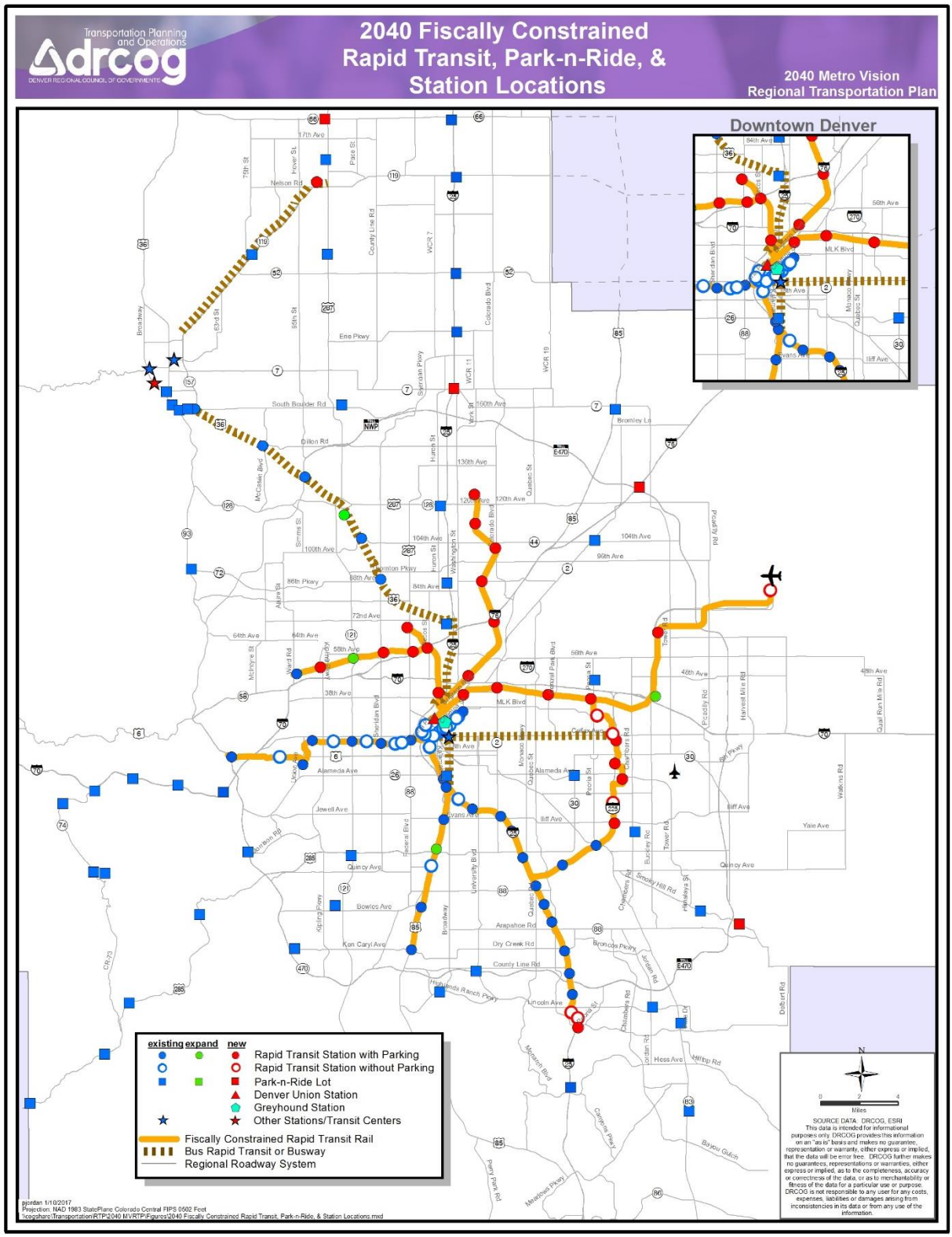
RTD's FasTracks is a multi-billion-dollar comprehensive transit expansion plan. This plan includes 122 miles of new commuter rail and light rail, 18 miles of bus rapid transit (BRT), and 21,000 new parking spaces at light rail stations and park-and-rides.

The West Rail line was the first FasTracks corridor to open in spring 2013. Several other corridors are set to open in 2016; two more are scheduled to open by 2019. All FasTracks projects are funded in the FasTracks Plan. However, RTD's current financial forecasts indicate not all projects will be constructed by 2040; these are:

- Central Rail Extension (30th and Downing to 38th and Blake)
- North Metro Rail Line from 124th Avenue and Eastlake to 162nd Avenue and SH-7
- Northwest Rail Line from Westminster Station to Longmont
- Southwest Extension from Littleton and Mineral to C470 and Lucent.

To learn more about FasTracks please visit [http://www.rtd-denver.com/Fastracks.shtml](http://www.rtd-denver.com/Fastracks.shtml).

**Figure 17: 2040 Fiscally Constrained Rapid Transit, Park-n-Ride, & Station Locations**



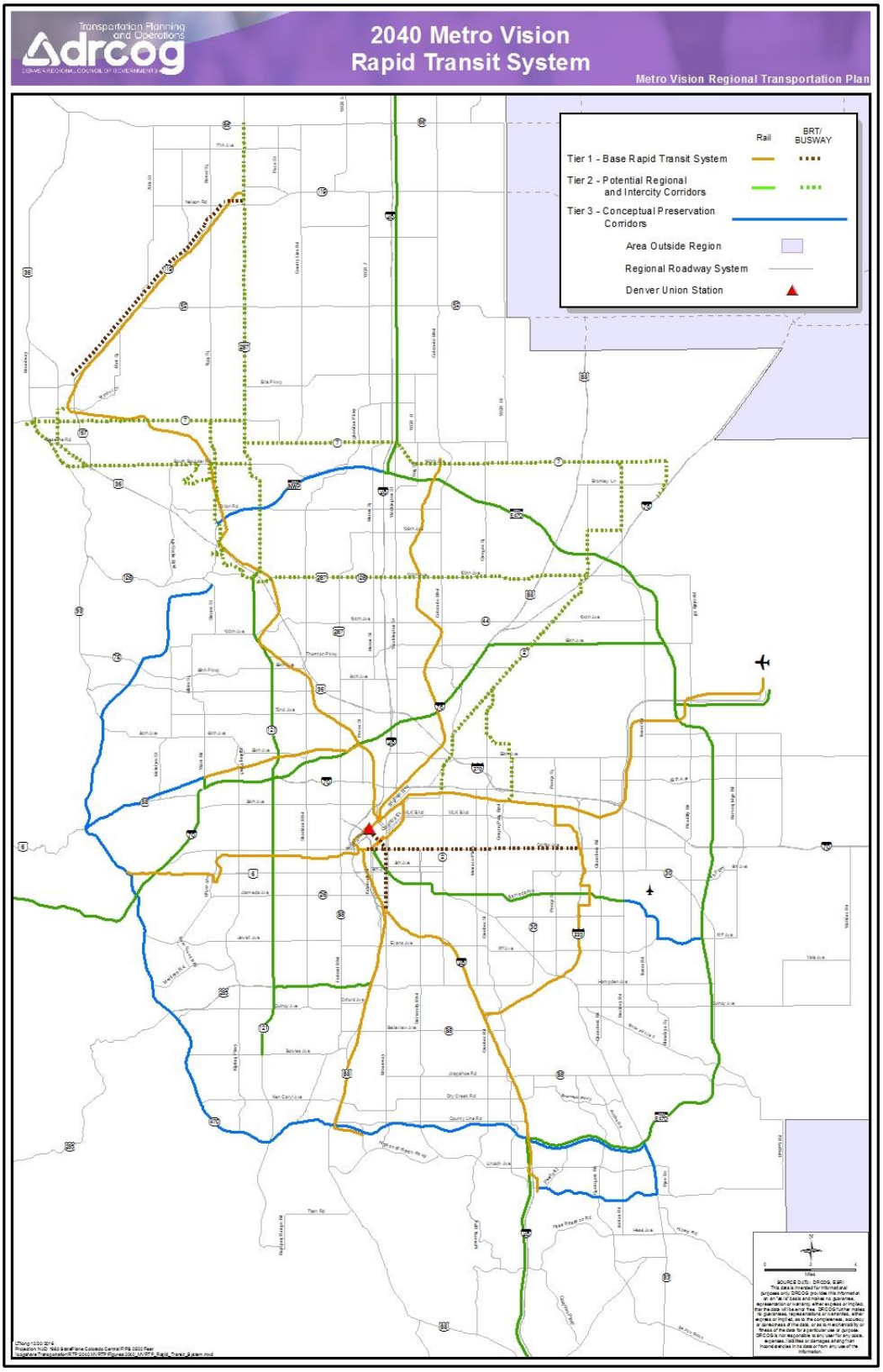
### Additional Envisioned Rapid Transit Corridors

The 2040 vision rapid transit network is an inventory of unfunded projects that are illustrative only. It is separated into three system tiers in Figure 19, including the fiscally constrained portion of the entire envisioned regional transit network. The following tiers represent relative priorities for implementation based on resources, time, and feasibility:

**Tier 2**: **Potential Regional and State Intercity Corridors**. Regional corridors that could have future rapid transit include Wadsworth Boulevard, C-470, and Speer and Alameda Avenue. Intercity corridors are envisioned to include rapid transit service west to the mountains (CDOT Advanced Guideway Study) and north to Fort Collins and south to Colorado Springs and Pueblo along Interstate 25 (CDOT Interregional Connectivity Study). The approximate mileage for Tier 2 projects within the DRCOG region is 350 miles. Tier 2 also includes arterial BRT projects identified in RTD's Northwest Area Mobility Study.

**Tier 3**: **Conceptual Preservation Corridors**. These future prospective rapid transit corridors are located along major highways or freight railroad lines such as E-470, Jefferson Parkway, and the U.S.-85 andI-76 corridor. Projects in this tier would cover about 82 miles, though depicted alignments are very conceptual. Rights-of-way will be preserved to the extent possible in these corridors for potential rapid transit use in the future.

**Figure 18: 2040 Metro Vision Rapid Transit System**



### RTD General Public Bus and Rail System

RTD's 2015-2020 Strategic Plan identifies seven overall strategies serving its mission. Each strategy is accompanied by a goal statement, narrative describing the strategic theme in more detail, and a set of initiatives that articulate short-, medium-, and long-term implementation. Most of these initiatives are ongoing in nature, and will be a continuous effort during the five-year plan time-frame. Below are those strategies and some associated initiatives. This plan is available at http://www.rtd-denver.com/documents/2015-2020-strategic-plan.pdf.

1. Deliver Customer Oriented Service
    - Provide a seamless customer interface between RTD and contracted services
    - Enhance policies for accommodating needs of passengers on vehicles
    - Provide opportunities for customer engagement
2. Foster a safety culture
    - Build a strong alliance and partnership between management, employees and customers
    - Establish and implement an internal safety audit system for bus operations
    - Create training modules for management and supervisory staff focused on safety training, accident prevention, team building, hazard recognition, and safety communication
3. Strengthen fiscal resiliency and explore financial innovation
    - Direct funding to the highest priority projects and enhance strategic budget planning
    - Seek innovative funding opportunities to expand revenue sources
    - Preserve financial sustainability and maintain a structurally balanced long-range budget
4. Improve customer access and support transit-oriented communities
    - Support and coordinate investments to improve first and final mile connections to transit facilities
    - Foster livable, equitable, and accessible communities at transit facilities
    - Optimize district-wide parking resources
5. Optimize service delivery
    - Pursue ongoing enhancements and improvements to the existing transit system (services and facilities)
    - Work with partners to develop, fund and complete FasTracks and increase ridership

- Continuously improve service delivery and reliability, including integration of new corridors with existing services

6. Use technology to operate efficiently and improve the customer experience
    - Integrate technology systems to automate data transfers and improve service delivery
    - Establish agency-wide information governance strategy
    - Improve the rider experience with easy fare payment options through Smart Card Technology
7. Foster a Dynamic and Sustainable Workforce
    - Establish transition paths for workforce as the agency evolves
    - Attract and train skilled workers in key trades
    - Strengthen workforce by building on the success of Leadership Programs

## B. Other Services

### Removing Barriers to Ride Fixed Route

Removing barriers to ride fixed route service can help reduce costs and provide independence. There is significant interest in this objective based on information gathered from public outreach. In addition, DRMAC facilitates a Transit and Accessibility Taskforce that focuses on this issue. Projects that can improve access to fixed route service and decrease reliance by individuals with disabilities on complementary paratransit include, but are not limited to, travel training and construction projects that improve accessibility to transit stops.

### Infrastructure Improvements

Improving the accessibility of transit stops, especially bus stops, and the surrounding pedestrian infrastructure is a key strategy for enabling older adults and individuals with disabilities to use fixed route transit. This includes adding amenities such as benches and shelters. Bus stops have been a focal point for many accessibility improvements since the ADA was enacted. The need for accessibility, however, extends beyond the actual stop to the pathways that connect to the stop. Cracked sidewalks, sidewalks with snow and ice, and missing sidewalk networks often pose a barrier to riding fixed route not only for older adults and individuals with disabilities but the general public as well.

Connections to and from bus stops are not always provided. Transit agencies do not always have the authority or ability to make these improvements. Sometimes improvements are not made due to lack of funding. Incomplete or poorly maintained sidewalks, difficult street crossings, lack of curb cuts, and

obstacles in the pathway such as utility poles create barriers for people with disabilities, limiting or preventing access to fixed-route transit service.

**Transit Supportive Land Use**

Land use and transit are inherently linked. Transit service is most effective when coupled with specific types of local land uses. Preferred uses have a high population ratio compared to the size of the spaces they occupy and create consistent foot traffic and high levels of activity. Further, built environments that are designed to maximize motor vehicle traffic convenience may reduce active transport (walking and cycling) accessibility, and transit accessibility since most transit trips include walking and cycling links. This is especially true for older adults and individuals with disabilities who may have a more difficult time walking longer distances and traversing built environments designed to accommodate automobiles.

### First and Last Mile Connections

Another key strategy to remove barriers to riding fixed route transit is providing first and last mile connections. First and last mile connections are improvements that can help better connect people from bus stops and transit stations to final destinations (and vice versa). Such improvements may include infrastructure such as sidewalks, shuttle buses, and bike sharing services.

### Travel Training

Travel training is instruction offered to those who need assistance to increase their mobility and travel on public transportation independently. It includes a variety of plans, methods and strategies used by professional trainers to increase the independent travel skills of the people they serve. Via Mobility Services offers this service to older adults, people with disabilities, and others living with mobility limitations who reside within the RTD system boundaries. In addition to one-on-one training, Via offers an abbreviated travel training program for groups, Seniors on the Move and Train the Trainer programs.

Improvements that remove physical and nonphysical barriers to using transit, making it more accessible for older adults, individuals with disabilities, and the general public, are a key strategy emphasized by this Coordinated Transit Plan.

#### Affordable Fare Programs

A common theme among public and stakeholder input was a need for affordable transportation for people with low incomes. This is an important but difficult issue to address given limited financial resources for low income riders and for RTD without an influx of additional funding to replace the

farebox revenues that would be lost from offering discounted fares. The Free Ride Longmont program provides fare free local bus service in Longmont on a pilot basis. In 2012, the town of Nederland, working with Boulder County's transportation department, administered a grant that provided Nederland residents free RTD transit passes. This program was funded through DRCOG's Regional Transportation Demand Management (TDM) Program Pool.

RTD is currently working with stakeholders to evaluate all of their pass programs which includes the investigation of opportunities to expand income qualified programs. Details of this program will become available in 2016.

### Improve Access to Employment

Key recommendations based on the findings of DRCOG's SCI study pertaining to access to employment include:

- Plan station areas as complete communities;
- Manage parking in station areas;
- Develop a regional approach to housing;
- Market transit-oriented communities as economic catalysts;
- Embrace collaboration as a foundation for success, and
- Expand education, outreach, and community engagement.

More information about this initiative can be found online at https://drcog.org/planning-great-region/sustainable-communities.

### Pilot New Technology and Practices to Improve Mobility

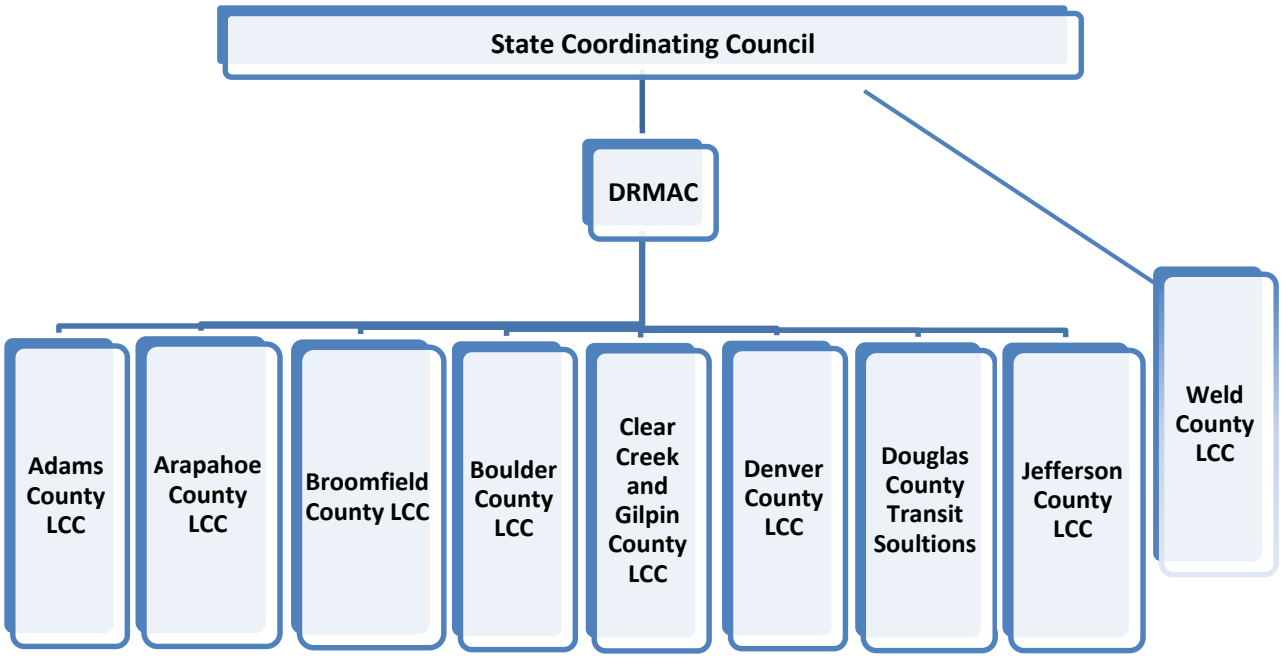
In October 2016, Transportation for America and Sidewalk Labs announced the sixteen members of a new T4A Smart Cities Collaborative to explore how technology can improve urban mobility, creating a tangible new opportunity for cities that did not win USDOT's Smart City Challenge. Over the coming year, the collaborative will bring together these cities to share best practices and technical assistance, and pilot new programs. Of the sixteen cities chosen from nearly sixty applicants, three are in the DRCOG region: Denver, Lone Tree, and Centennial.

## C. Future Human Service Transportation Coordination Efforts and Strategies

### Coordination Efforts

Nine Local Coordinating Councils are active in the DRCOG region including the Weld County Mobility Council supported by the North Front Range Metropolitan Planning Organization. Clear Creek and Gilpin Counties share a Local Coordinating Council. DRMAC serves as the Local Coordinating Council for Denver County and the Regional Coordinating Council for most of the DRCOG region. As the Regional Coordinating Council, DRMAC facilitates coordination between them. The State Coordinating Council supports the Local Coordinating Councils and Regional Coordinating Council s across the state. Figure 20 illustrates these relationships.

**Figure 19: Human Service Transportation Coordination Organizations**



The Colorado Interagency Coordinating Council for Transportation Access and Mobility (State Coordinating Council) was created in 2005 in response to the federal *United We Ride* initiative. The State Coordinating Council brings together various state departments with programs that either provide or depend on transportation services for their clients. The Council addresses issues related to funding and regulatory requirements at the state level. The Council's goals include:

- More rides for target populations for the same or fewer assets;
- Simplify access, and
- Increase customer satisfaction.

The Council produced the how to manual *Handbook for Creating Local Coordinating Councils in Colorado*.

DRMAC works to ensure people with mobility challenges have access to the community by increasing, enhancing, sharing, and coordinating regional transportation services and resources. DRMAC initiated the Transportation Coordination Systems to improve coordination of human service transportation programs and service delivery in the Denver region. This study, funded by the Veterans Transportation Community Living Initiative examined ways to coordinate trip requests, booking, scheduling to help veterans with mobility challenges better navigate their community. Of course, the while the project focuses on improving mobility for veterans, the improvements will benefit many more. Based on Transportation Coordination Systems recommendations, DRMAC recently initiated a trip exchange database technology development project. This technology is anticipated to help multiple human service transportation agencies share trips to use existing resources (such as vehicles) more efficiently and provide more and better service.

### Strategies

The following are suggested strategies to address human service transit coordination. These strategies are based on public meetings, other plans, surveys, and other input sources.

### Fund transit projects that address identified needs and FTA program guidelines

The project selection process for FTA Section 5310 should focus on service needs relative to these and other program goals:

- Enhance mobility for seniors and persons with disabilities;
- Serve the special needs of transit-dependent populations beyond traditional public transportation services and ADA complementary paratransit services, and
- Coordinate human service transportation and transit.

### Spend local, regional, state, and federal funds more efficiently

It is important to find ways to do more with existing resources. A key strategy is blending multiple funding sources. Transportation providers and local governments should work with state and regional partners to combine funds like FTA 5310 with Older Americans Act, Medicaid, and others to fill more seats on each vehicle to reduce inefficiencies. Via, SRC, and Douglas County do this. In addition, there is also the opportunity to blend federal funds to reduce or eliminate the need for transportation grantees to contribute toward the local match.

### Increase human service transportation coordination efforts

Greater coordination is a critical strategy to fund more trips with existing revenues. DRMAC coordinates with many organizations and agencies to better meet the needs of the region by increasing efficiencies. Stakeholders and transportation providers should continue to work with DRMAC and other groups on efforts to improve coordination of human service transportation. Increasing efficiencies could mean more transportation options for a greater variety of trip purposes including shopping trips and social visits. This could help more people “age in place” and live independently longer deferring the costly move to assisted living facilities and nursing homes.

Integrating veterans and veterans programs into the coordinated transportation system could help veterans better access transportation. Stakeholders in the region should continue to reach out to veterans and veterans groups so that veterans’ needs are accounted for. The Transportation Coordination Systems project will continue to be a key instrument to achieve this.

### Address cross-jurisdictional, cross service boundary, and interregional trips

Mobility needs do not stop at city, county, or even regional boundaries; residents across the Denver region often travel across jurisdictions to get to their destinations. For example, The Veterans Affairs Medical Center in Denver is a destination that draws veterans throughout the region and beyond. One of the key needs and strategies is to improve service and coordination across jurisdictional boundaries. A key objective of the Veterans Transportation and Community Living Initiative funded Transportation Coordination Systems project is to help veterans access VA medical facilities and other important destinations dispersed across the region.

The Via Mobility Services and RTD Coordination Pilot Project uses automated, mobile technology to coordinate RTD and Via demand response services in Longmont. Goals for this ongoing project include increasing trips while maintaining or reducing the combined vehicles in service, decreasing cost, and developing a model that can be used in other places around the region and the country. The initial funding for this pilot program was provided by FTA 5317 (New Freedom), RTD, the City of Longmont, and Via Mobility.

Via has since been awarded an FTA Mobility Services for All Americans (MSAA) grant to enhance trip data exchange between RTD's general public Call-n-Ride services and human services transportation provided by Via and other entities in the region. The project is intended to address institutional and jurisdictional boundaries that limit coordination as well as technological barriers.

Figure 3 from the 2040 RTP shows workflow patterns into and out of the DRCOG region. One significant commuting pattern that crosses MPO boundaries is between Boulder and Fort Collins. Local agencies are currently collaborating across jurisdictional and MPO boundaries on a project that extends bus service between these two cities. As the project moves forward, those involved are designing a blueprint for similar future projects. Public and private employers are key stakeholders who may be able to help work towards solutions.

### Implement trip exchange initiatives from transportation studies

Two studies were recently conducted to evaluate strategies for coordination of human service transportation in the Denver region: the Transportation Coordination Systems and the *Evaluation of the DRCOG Area Agency on Aging Transportation Support Service Program* by BBC Consulting.

Both studies share the same overarching goal: accessible and affordable transportation that is easy to book and meets current and future demand. Shared components recommended by both studies include:

- Leverage funding to support human service transportation
- Offer region-wide support and incentives to all transportation agencies
- Enable electronic data interchange capability within information technology systems
- Explore new sources of funding with a long term focus
- Foster regional coordination and cooperation
- Strengthen county partnerships

A key difference between the two studies – the structure of a potential regional "one call, one click center" – needs to be further defined. The Transportation Coordination Systems study recommended a sub-regional brokerage approach, while the BBC study recommended the region explore a single call center for scheduling and dispatch. After the trip exchange database is developed, stakeholders should address other TCS and BBC recommendations and re-evaluate the structure of the one-call-one-click center.

**Improve access to key services such as healthcare and employment through coordination**

The pervasiveness of chronic disease has a desperate impact on low-income populations. A key factor is lack of transportation for treatment and screening. An effective transportation system can help individuals preserve and improve their independence and decrease the likelihood of institutionalization. This prompted the FTA to launch the Rides to Wellness Initiative to increase partnerships between health and transportation providers and show the positive financial benefit to such partnerships. In DRCOG region, continued efforts to coordinate non-emergent transportation with HCPF can improve efficiency and effectiveness and improve access to healthcare, especially for low-income individuals.

## Conclusion

In addition to providing a broad view of the region's transit system and serving as the transit component of the Metro Vision Regional Transportation Plan, this document also serves as the Coordinated Public Transit and Human Services Transportation Plan for the DRCOG region (Coordinated Transit Plan). A Coordinated Transit Plan is federally required, particularly in selecting projects for funding in the FTA 5310 grant program. This integrated plan addresses transit geared for specific populations and transit available for the general public because both are important to increase mobility. For example, while many older adults and individuals with disabilities will be served by transit modes specifically designed for their needs, many more will use general public transportation.

Transit is a vital component in the DRCOG Region's multimodal transportation system. It provides mobility and access for many and is available throughout the DRCOG region in rural, suburban, and urban areas. There are around 350,000 transit boardings each weekday. Not only does transit connect residents, employees, and visitors to jobs, schools, shopping, medical care, and recreation, it promotes independence and economic development.

# APPENDIX 7

## 2040 MVRTP Active Transportation Component

# ACTIVE TRANSPORTATION COMPONENT

## 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 about 1.4 million 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: (1) provide safe and comfortable options for people of all ages and abilities; and (2) to fulfill the performance measures and targets currently being established as part of Metro Vision 2040.

The Active Transportation component of the 2040 MVRTP 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 early 2017. The Active Transportation Plan will eventually become an element of the MVRTP.

## B. Defining Active Transportation

Active transportation[1] 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 wheelchairs[2], 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, over 1,400,000 trips are made by walking and bicycling in the DRCOG region (*DRCOG Travel Model, 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 ten percent (*DRCOG Travel Model, 2015*) of all person trips, they account for about 25 percent (*National Highway Traffic Safety Administration – Fatality Analysis Reporting System, 2014*) of traffic fatalities, a disproportionally high percentage considering the shorter distances and travel times by these modes.

***Planimetrics and quantifying sidewalk miles***

In 2016, DRCOG completed the region-wide Planimetrics project to map infrastructure features and assets, including sidewalk centerlines.

1,308 square miles of the urban core in the DRCOG Region were mapped. Within that area, there are approximately 17,700 miles of sidewalk.

### 1. Miles of Active Transportation Facilities

DRCOG collects and maintains Geographic Information Systems 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, DRCOG has

[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.

collected 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 (*http://gis.drcog.org/datacatalog/content/planimetrics-2014-centerline-sidewalks*).

Obtaining bicycle facilities data and determining the number of miles is attainable by means of Geographic Information Systems. DRCOG collects Geographic Information Systems 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**

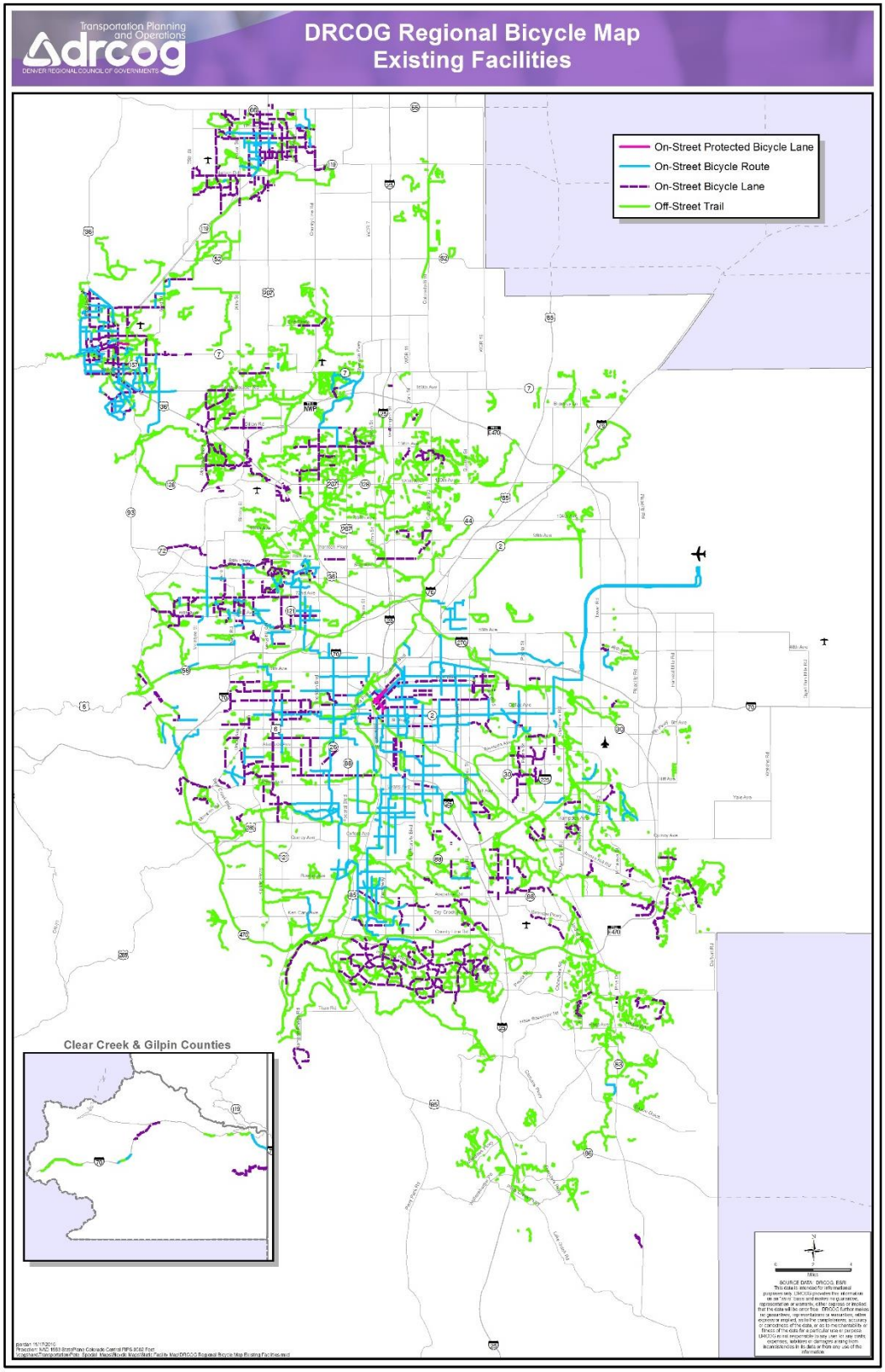
| Bicycle Facility Type | Miles |
|---|---|
| **Roadways with Signed Shared Lanes:** | |
| **Bicycle Route** | 325 |
| **Marked Shoulder Lanes** | 28 |
| **Roadways with Bicycle Lanes** | 430 |
| **Roadways with Protected Bicycle Lanes** | 3 |
| **Multi-use Trail:** | |
| **Wide Sidewalk*** | 35 |
|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

*** The multi-use trail category includes select 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 Geographic Information Systems 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: (1) on-street bicycle route; (2) on-street bicycle lane; (3) on-street protected bicycle lane; and (4) off-street trails. The map also includes bicycle share station locations. Figure 1 is an image of the Denver Regional Bicycle Map.

**Figure 1**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DRCOG Regional Bicycle Map
Existing Facilities
On-Street Protected Bicycle Lane
On-Street Bicycle Route
On-Street Bicycle Lane
Off-Street Trail
Clear Creek & Gilpin Counties

## 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 or 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.

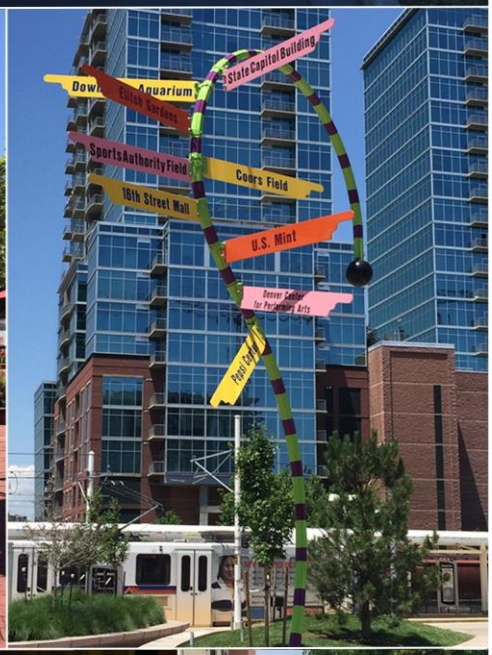
  > ***Conduits for walking***
  >
  > As conduits for pedestrian movement and access, (sidewalks) enhance connectivity and promote walking.
  >
  > — NACTO Urban Street Design Guide

  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.

**Table 2**
**Pedestrian Facility Types in the DRCOG Region**

| Pedestrian Facility Category | Facility Type | Description | Photo # |
|---|---|---|---|
| **Sidewalks** | *Attached Sidewalks* | Pedestrian travelways connected to the curb or motor vehicle travel lane edge. | Attached sidewalk #1<br>Attached sidewalk #2<br>Attached sidewalk #3 |
| | *Detached Sidewalks* | Pedestrian travelways separated from vehicle travel lanes using a planting strip or other appropriate buffer treatment. | Detached sidewalk |
| | *Shared-Use Paths* | 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** | *Crosswalks* | 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 |
| | *Pedestrian Islands* | 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. | |
| | *Shoulders (rural)* | 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** | *Alleys* | 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) |
| | *Intersections at Alleys* | 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 |
| | *Pedestrian walkways in parking lots and structures* | 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 |
| | *Pedestrian Zones and Plazas* | 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** | *Wayfinding* | 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



- ***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**

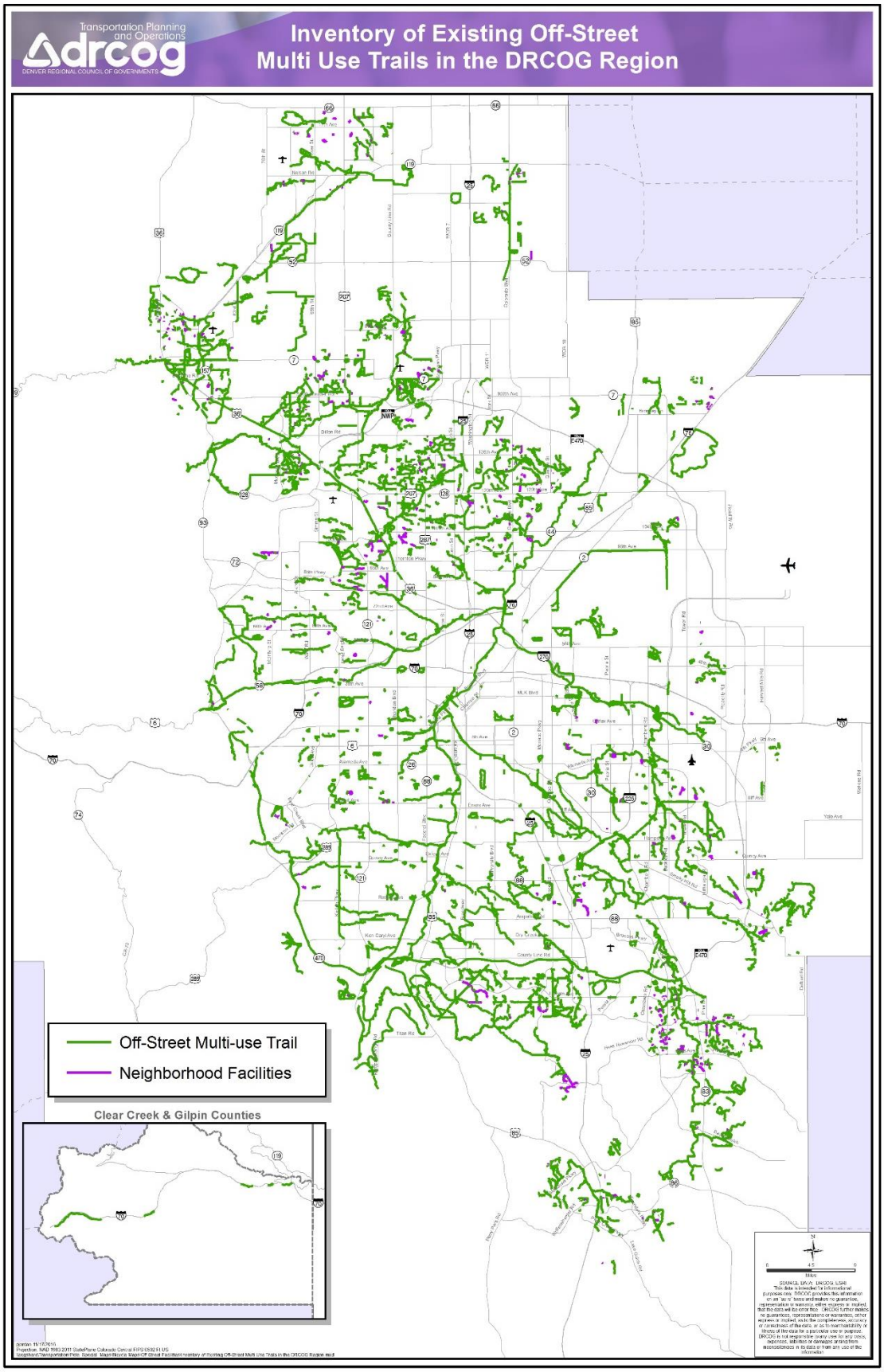
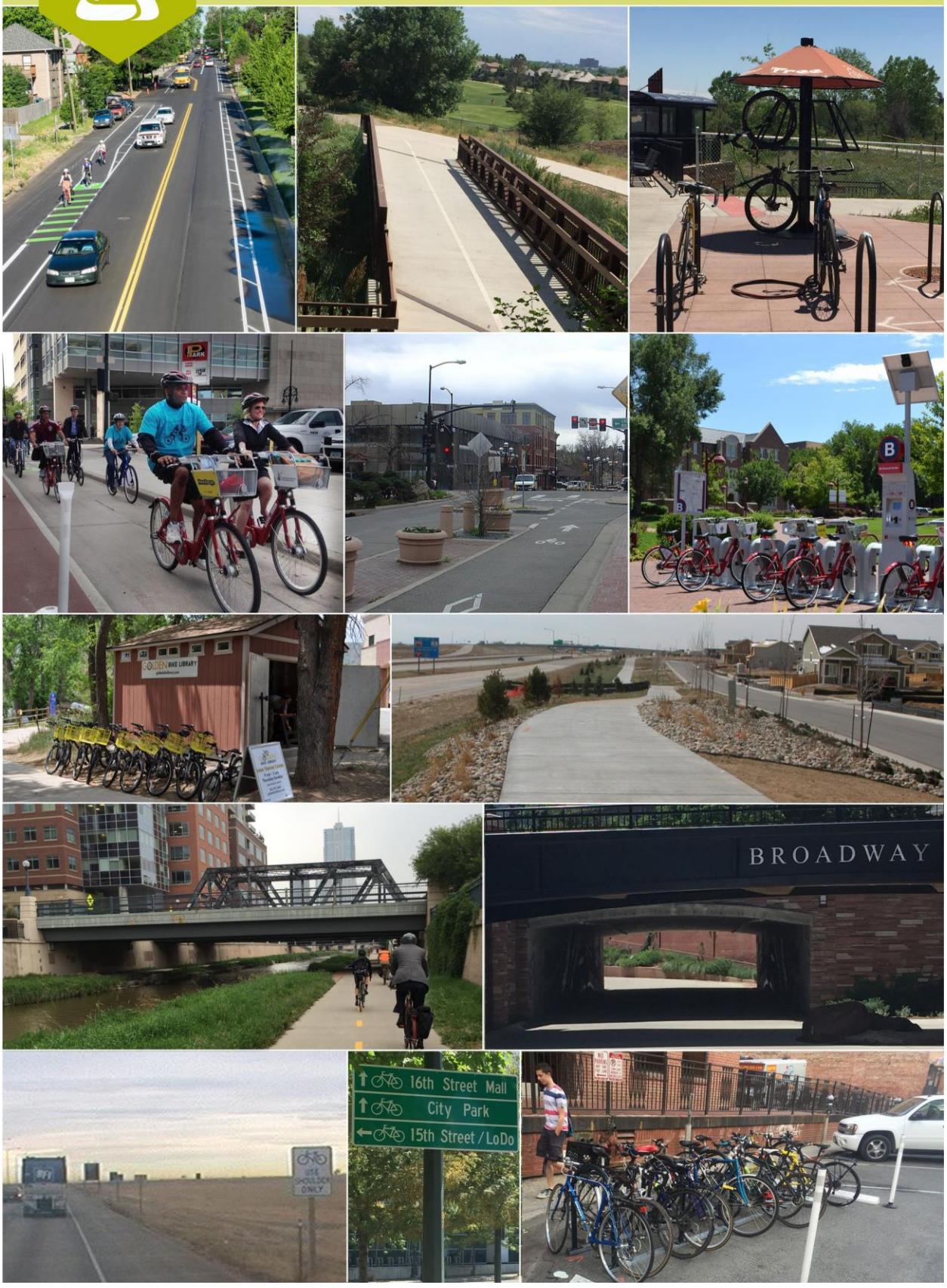

Transportation Planning and Operations
drcog
DENVER REGIONAL COUNCIL OF GOVERNMENTS
Inventory of Existing Off-Street Multi Use Trails in the DRCOG Region
Off-Street Multi-use Trail
Neighborhood Facilities
Clear Creek & Gilpin Counties

**Table 3**
**Bicycle Facility Types in the DRCOG Region**

| Bicycle Facility Category | Facility Type | Description | Photo Links |
|---|---|---|---|
| **On-Street Bicycle Facilities** | *Conventional Bicycle Lanes* | On-street bike lanes for exclusive use by bicyclists through the use of pavement markings and signage. They are *typically* 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 |
| | *Buffered Bike Lanes* | 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 |
| | *Protected Bike Lanes (PBL)* | 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 |
| | *Bicycle Boulevards* | 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 |
| | *Paved Shoulder Bicycle Routes* | 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** | *Shared-use Paths* | 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) |
| | *Bridges/Overpasses and Underpasses* | 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** | *Bike Share* | Bicycles available for short-term use from a network of stations within a given geographic area. | Bike share |
| | *Bicycle Libraries* | 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) |
| | *Bicycle Parking* | 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) |
| | *Secure Bicycling Parking* | 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) |
| | *Wayfinding* | 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 |

# Bicycle Infrastructure in the DRCOG Region



## 4. Mode Share and Trip Statistics

On a typical day in the Denver region about 1.25 million pedestrian trips and about 162,000 bicycle trips are made (*DRCOG Travel Model, 2016*). 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, Five Year American Community Survey 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 typically walk and bicycle to work (*American Community Survey, One-Year Estimates*).

### *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 final mode of travel when combined with other modes.

- ***All Trips.*** Of the more than 13.5 million total person trips (all modes) made in the region per day, nine 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 (*DRCOG 2010 Front Range Travel Counts*). Of all the daily trips in the region that are 0.4 miles or less, around 100,000 are made by driving alone (*DRCOG Travel Model, 2016*).

- ***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, 2010-2014 American Community Survey*). This percentage is much higher when weather is nicer and in denser locations with a mix of land uses. Even more people walk to transit to get to work. While the percentage of people walking to work has declined since 1980, trends have remained relatively steady since 2000 with slight fluctuations.

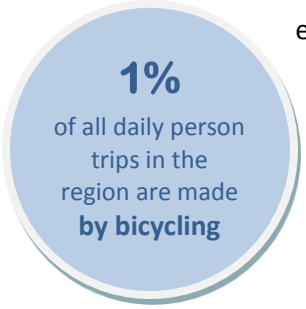
**Walk to Work (35-year trend – DRCOG Region)**

| | 1980 | 1990 | 2000 | 2010 | 2014 |
|---|---|---|---|---|---|
| Percent of Workers | 4.7 % | 3.4 % | 2.4 % | 2.2 % | 2.4 % |

*US Census (1980-2010); 5-Year American Community Survey (2010-2014)*

### *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 13.5 million total person trips (all modes) made in the region per day, about 162,000, or one percent of these trips, are made by bicycling. The average bike trip distance in the DRCOG region is about two miles (*DRCOG 2010 Front Range Travel Counts*). There are more than one million drive-alone trips of two miles or less made each day in household vehicles (*DRCOG Travel Model 2016*). There is potential to convert some of these short drive-alone trips to 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, American Community Survey – Five Year 2010-2014*). This percentage is much higher in warm weather months and in denser 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 (*American Community Survey, Five Year, 2010-2014*). This characteristic is typical nationwide.

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

| | 1980 | 1990 | 2000 | 2010 | 2014 |
|---|---|---|---|---|---|
| Percent of Workers | .7 % | .7% | .7 % | 1.1% | 1.2% |

*US Census, 1980 – 2000; American Community Survey Data 2010 – 2014*

## 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

## 5. Safety

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 (*National Highway Traffic Safety Administration – Fatality Analysis Reporting System data*), yet only nine percent of all trips were made by walking (*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, National Highway Traffic Safety Administration 2014*).

Many factors contribute to collisions involving pedestrians:

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

### *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 (*Fatality Analysis Reporting System 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, Fatality Analysis Reporting System data 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* (to be updated as part of the Active Transportation Plan).

**SUMMARY**

**Bicycle Crash Characteristics**
**in the DRCOG Region**

80% of bicycle crashes result in injuries

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 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

### *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, supported by Federal Highway Association, is a highway safety vision in the U.S. that includes numerous organizations committed to reducing annual U.S. traffic fatalities to zero. The Toward Zero Deaths Plan provides organizations in the fields of engineering, law enforcement, education and emergency medical services with initiatives and safety countermeasures designed to eliminate traffic fatalities. 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.

### *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.

#### *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

### *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 (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 (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 (*People for Bikes, Statistics Library*). The health benefits of

#### *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.

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, 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, or public education and buy-in is necessary.

#### *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

#### *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

### *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-single occupant vehicle mode share to work, and reducing greenhouse gas emissions, vehicle miles of travel, and number of traffic fatalities.

## E. Future Trends for Active Transportation – Projections for 2040

Looking forward to 2040, total person trips are forecast to increase by 37 percent, whereas walking and bicycling trips combined are projected to increase by about 48 percent. Currently, about 1.25 million, or nine percent of trips are made by walking. By 2040, nearly two million trips will be made by walking each day, accounting for 10 percent of all weekday person trips. Bicycle trips are also projected to increase, from around 162,000 to 215,000 trips per day (*DRCOG Travel Model 2016*).

**Estimated Daily Walking and Bicycling Trips: 2015 and 2040**

| Daily DRCOG region trips | 2015 | 2040 |
|---|---|---|
| **Total Person Trips** | 13,810,400 | 18,986,600 |
| **Walking Trips** | 787,700 | 1,109,800 |
| **Bicycling Trips** | 148,500 | 192,500 |
| **Walking to/from Transit Trips** | 460,300 | 757,300 |
| **Bicycling to/from Transit Trips** | 13,200 | 22,200 |
| **Total Walking and Bicycling Trips** | **1,409,700** | **2,081,800** |

*DRCOG Travel Model 2016*

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 48%.
- While the DRCOG region has a robust pedestrian and bicycle network, there are many gaps in the system and barriers to bicycling and walking.
- There are numerous quality of life benefits associated with walking and bicycling.
- 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.

## F. Active Transportation Goals

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 objectives must be

addressed:

- Increase walking and bicycling mode share and trips beyond what is projected.
- Provide a robust walking and bicycle network for people of all ages and abilities.
- 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 objectives 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 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 objectives identified. These and additional elements will be further explored and expanded upon in the development of DRCOG's Active Transportation Plan, scheduled to commence in early 2017.

### 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

***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

travel.

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 more people 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,

transit users, and travelers of all ages and abilities will be able to move along the street network safely. Although the Federal Highway Association 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, U.S. Department of Housing and Urban Development, and U.S. Environmental Protection Agency *(Federal Highway Association, 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 infrastructure are funded directly through the Transportation Improvement Plan process. The percentage of funds allocated to pedestrian and bicycle projects has increased over the past three TIP cycles. In the current Transportation Improvement Plan (2016-2021), 22 percent of funds are allocated to projects classified as bicycle and/or pedestrian infrastructure and all of the projects were either protected or grade separated from the roadway. Pedestrian and bicycle projects are also constructed as elements of larger Transportation Improvement Plan projects, such as roadway projects. Roadway projects have been incentivized in the Transportation Improvement Plan application process to include multimodal features like bicycle and pedestrian travelways and support facilities.

In 2017, DRCOG will prepare an Active Transportation Plan. The Active Transportation Plan will become an element of the MVRTP. The Active Transportation Plan will expand upon the elements of this section

of the MVRTP and incorporate 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 the Active Transportation Plan.

## I. Design Guidelines and Resources

Pedestrian and bicycling facilities are not one size fits all. Designs will vary depending on local community factors such as existing and planned land uses, density, adjacent roadway types and widths, 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 Transportation Improvement Plan policy does establish certain design requirements for project eligibility, such as minimum widths for multiuse facilities, and directs jurisdictions to follow design standards set forth by American Disability Act and the American Association of State Highway and Transportation Officials. 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 use these guides in the planning and design process of pedestrian and bicycle facilities. DRCOG encourages jurisdictions to communicate and coordinate 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

**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).*

# APPENDIX 8

## Consideration of FAST Act Federal Planning Factors

# APPENDIX 8

**Consideration of FAST Act Federal Planning Factors**

*The* Fixing America's Surface Transportation (FAST) Act calls for metropolitan planning organizations to ensure that the planning process provides for consideration and implementation of projects, strategies and services for the 10 factors described below. In addition to identifying the planning factors, the list includes descriptions of how the 2040 Metro Vision Regional Transportation Plan (2040 MVRTP) has considered them. The 2040 MVRTP includes the 2040 Fiscally Constrained Regional Transportation Plan, the transportation theme (component) of DRCOG's Metro Vision, as well as components addressing transit, freight and active transportation. These elements are integrated within the 2040 MVRTP to help address the planning factors.

**1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.**

The 2040 MVRTP provides a network of transportation facilities and connections to link employment centers with major multimodal passenger facilitates and intermodal freight terminals, both nationally and internationally. The plan specifically addresses connections with Denver International Airport, which provides a direct link between the region's economy and the global economy. Connections with the region's other general aviation airports to facilitate business travel and cargo are also emphasized in the MVRTP. The provision of an extensive transit system enables a greater share of the labor force to have access to more jobs. Finally, the 2040 MVRTP includes an extensive freight component addressing these issues.

**2. Increase the safety of the transportation system for motorized and nonmotorized users.**

The plan addresses several aspects of safety such as law enforcement and legislative actions, planned safety improvements to be made, safety-related maintenance activities, and the relationship to CDOT's *Strategic Highway Safety Plan* (Chapter 4). Although site-specific safety-designated improvements, because of their relatively small scale, are not specifically listed or mapped, safety is being given due consideration through Unified Planning Work Program activities, Transportation Improvement Program project selection criteria, future Regional Transportation Plan system improvement evaluations and the incorporation of safety elements into larger-scale projects. Safety was also a key criterion in evaluating and prioritizing regionally significant roadway capacity projects for regional funding in the 2040 MVRTP (Appendix 1). The 2040 MVRTP also identifies funding commitments to future safety projects, strategies and services. Additionally, the plan also sets the stage for the FAST Act's performance-based planning process by identifying baseline data for

and discussing safety-related performance measures (Chapter 7), as well as including safety data from DRCOG's most recent *Traffic Crashes in the Denver Region* report (Chapters 4 and 7). Finally, Metro Vision's transportation theme includes a performance measure and target addressing the region's focus on reducing traffic fatalities (Chapter 3).

**3. Increase the security of the transportation system for motorized and nonmotorized users.**

Residents and visitors will travel in the Denver region with confidence. DRCOG's role in regional transportation security activities are discussed in detail in Chapter 4, with an emphasis on substantial coordination among all agencies charged with transportation system security. Activities that facilitate preparedness and prevention, such as vulnerability assessments, are key to increasing security, but attention will also be paid to improving response and recovery.

**4. Increase accessibility and mobility of people and freight.**

A key focus of the 2040 MVRTP is to provide improved mobility for the region's residents and businesses. Both roadway and transit improvements are identified and funded in the 2040 MVRTP that reduce delay and enhance mobility. The plan also includes several alternative modes of transportation to provide travel choices. Future funds are allocated for promoting alternative modes on three levels: regionally, in subareas and at individual business sites. Pedestrian and older adult accessibility strategies are emphasized in the 2040 MVRTP's active transportation and transit plan components. Mobility of freight and goods movement is specifically addressed in the freight component. Management activities to improve freight mobility include incident detection and response, and Intelligent Transportation Systems (ITS) applications. The plan also identifies pools of funding that can be used for all previously mentioned activities.

**5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.**

All these concepts are part of the 2040 MVRTP and Metro Vision:

- *Protecting and enhancing the environment* is a key focus of the 2040 MVRTP (Chapter 7). The planning process facilitated the active involvement of the air quality regulatory agencies and residents interested in air quality. The 2040 MVRTP is in conformance with the State Implementation Plan for air quality. Projects identified for inclusion in the transit and highway networks are considered with respect to environmental impact at the system level.

DRCOG participated in CDOT's Planning Insight Network (PIN), an interactive web-based mapping tool and process to solicit environmental consultation by resource agencies on major projects and travel corridors. DRCOG submitted a representative list of major freeway and arterial roadway capacity projects to CDOT for it to map in the PIN tool for consultation and comment by resource agencies. DRCOG reviewed and considered resulting comments. Further, before individual major projects go through final design engineering and construction, federal requirements specify they must go through appropriate National Environmental Policy Act (NEPA) reviews and studies. This ensures project alignments, designs and mitigation measures result in environmentally sensitive projects. Chapter 7 also discusses other environmental issues, data and considerations at the long-range planning level.

- *Energy conservation* is promoted through Metro Vision land use and development objectives, and by attempting to minimize travel delays and provide extensive transit services and other alternative travel modes through the 2040 MVRTP. Metro Vision objectives such as extent of urban growth (urban growth boundaries), urban centers and community design seek to avoid land use patterns that lead to increased vehicles miles traveled and by encouraging more pedestrian- and transit-friendly development. In the 2040 MVRTP, promoting and facilitating alternative travel modes are acknowledged through the travel demand management programs, such as DRCOG's Way to Go program, funded through the plan, as well as the transit and active transportation components. In addition, the synchronization of traffic signals across the region is supported in both the 2040 MVRTP and in Metro Vision. DRCOG provides for traffic signal synchronization through its regional traffic operations program, including the Traffic Signal System Improvement Program, which times signals to be more efficient and coordinated across corridors. These activities result in reducing stop-and-go delays and achieve fuel savings. Finally, petroleum fuel consumption and greenhouse gas emissions are reported in the 2040 MVRTP (Chapter 7).

- *Quality of life* is also addressed throughout the 2040 MVRTP and Metro Vision. Several objectives and strategic initiatives (Metro Vision) and funded projects, programs and services (2040 MVRTP) will improve quality of life for individuals throughout the region. The very first principle of Metro Vision is to "protect and enhance the region's quality of life" and its most basic purpose is to "safeguard for future generations the region's many desirable qualities." From the 2040 MVRTP perspective, environmental justice for disadvantaged individuals will be enhanced by the implementation of the regional transit system, alternative mode services and facilities, and environmentally sensitive designs developed for specific projects (Chapter 7).

- Metro Vision explicitly *considered state and local planned growth and economic development patterns* through extensive outreach to local governments and economic development organizations. The 2040 MVRTP serves the desired growth and development identified in Metro Vision.

**6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.**

The 2040 MVRTP specifically address the integration of transportation system elements. The plan discusses multimodal connections with respect to several modes, as well as shared opportunities for multimodal transportation development. For example, Park and ride lots will have convenient auto, pedestrian and bicycle connections. Transit-to-transit transfer facilities are identified as well as transit-to-aviation connections. The key multimodal passenger facilities identified in the 2040 MVRTP are Denver Union Station and Denver International Airport. Roadway improvements near major intermodal freight facilities are included in the MVRTP and reference is provided to new or improved intermodal freight facilities that are envisioned. First- and last-mile connections—and the role of multimodal travel options to enable them—are discussed throughout the 2040 MVRTP. Finally, system connectivity is addressed in the plan's freight, transit and active transportation components, while freight is addressed in-depth in the freight component.

**7. Promote efficient system management and operation.**

The 2040 MVRTP makes extensive reference to system management and operational activities (particularly in chapters 4, 5, 6 and 7). The plan identifies and funds operational improvements, facility management, traveler and transit information systems, and travel demand modification efforts to ensure that the regional transportation system will work as efficiently as possible. ITS efforts will provide transportation efficiency benefits, as well as safety and security enhancements. The 2040 MVRTP also contemplates the role evolving technology could play in system management and operations. Finally, a key outcome (with associated objectives and strategic initiatives) of *Metro Vision's* transportation theme is that "the regional transportation system is well-connected and serves all modes of travel" (Chapter 3).

**8. Emphasize the preservation of the existing transportation system.**

Preservation of the existing transportation system is a key focus of the 2040 MVRTP. Chapter 5 emphasizes the allocation of more than half of available revenues toward system preservation, operation and maintenance. Preservation is applied to all types of travel mode facilities on the system, from roadways to

transit stations to sidewalks. Chapter 7 also discusses DRCOG, CDOT and RTD activities related to system preservation and state of good repair.

**9. Improve the resiliency and reliability of the transportation system and reduce or mitigate stormwater impacts of the transportation system.**

Transportation system resiliency is addressed in Chapter 4 of the 2040 MVRTP and is a core theme (chapter) of Metro Vision, which addresses resiliency of the natural and built environment. In the 2040 MVRTP, transportation resiliency is addressed through many facets, such as safety, security and operations (Chapter 4), as well as environmental mitigation (Chapter 6). While stormwater reduction and mitigation is addressed during the project development and implementation process, Chapter 7 discusses the importance of stormwater and related environmental issues at the regional level. DRCOG monitors NEPA and Planning and Environmental Linkage studies to ensure stormwater (among many other issues) is addressed during corridor and project studies.

**10. Enhance travel and tourism.**

The 2040 MVRTP funds a connected network of multimodal projects, programs and services to increase travel mobility for all users. The issues of travel, mobility and accessibility are discussed throughout the plan, as is the issue of balancing increased mobility for individual users while desiring to reduce or limit increases in vehicle miles traveled, greenhouse gas emissions and single-occupant vehicle mode share to work at the regional level. Traffic operations and technology also enhance the traveling experience, from app-based notifications and wayfinding to traffic operations that result in smoother and more predictable travel among, and between, travel modes. The 2040 MVRTP's investments in key transportation facilities and services also facilitate tourism, such as via interstate highways, Denver International Airport and Denver Union Station. For example, RTD's FasTracks system includes connections to Denver International Airport (University of Colorado A Line), major regional tourist attractions (Coors Field and the Denver Broncos' stadium), and other important activity centers that facilitate tourism (and general travel).

# APPENDIX 9

## Adopting Resolution

**(to be provided)**

DENVER REGIONAL COUNCIL OF GOVERNMENTS
BOARD OF DIRECTORS
(November 2016)

***Officers***

**Elise Jones,** Chair
**Bob Roth**, Vice Chair
**Herb Atchison,** Secretary
**Bob Fifer**, Treasurer
**Jackie Millet**, Immediate Past Chair
**Jennifer Schaufele**, Executive Director

| | |
|---|---|
| **Adams County** | Eva Henry |
| **Arapahoe County** | Bill Holen |
| **Boulder County** | Elise Jones |
| **City and County of Broomfield** | Dennis Harward |
| **Clear Creek County** | Tim Mauck |
| **City and County of Denver** | Robin Kniech |
| **City and County of Denver** | Crissy Fanganello |
| **Douglas County** | Roger Partridge |
| **Gilpin County** | Gail Watson |
| **Jefferson County** | Don Rosier |
| **Arvada** | Bob Fifer |
| **Aurora** | Bob Roth |
| **Bennett** | Larry Vittum |
| **Black Hawk** | David Spellman |
| **Boulder** | Aaron Brockett |
| **Bow Mar** | Anne Justen |
| **Brighton** | Lynn Baca |
| **Broomfield** | David Beacom |
| **Castle Rock** | George Teal |
| **Centennial** | Doris Truhlar |
| **Central City** | Ronald Engels |
| **Cherry Hills Village** | Laura Christman |
| **Columbine Valley** | Richard Champion |
| **Commerce City** | Rick Teter |
| **Dacono** | Debbie Nasta |
| **Deer Trail** | Vacant |
| **Edgewater** | Steven Conklin |
| **Empire** | Vacant |
| **Englewood** | Joe Jefferson |
| **Erie** | Geoff Deakin |
| **Federal Heights** | Daniel Dick |
| **Foxfield** | Lisa Jones |
| **Frederick** | Laura Brown |
| **Georgetown** | Lynette Kelsey |
| **Glendale** | Scott Norquist |
| **Golden** | Saoirse Charis-Graves |
| **Greenwood Village** | Ron Rakowsky |
| **Idaho Springs** | Michael Hillman |
| **Lafayette** | Brad Wiesley |
| **Lakewood** | Shakti |
| **Larkspur** | Gerry Been |
| **Littleton** | Phil Cernanec |
| **Lone Tree** | Jackie Millet |
| **Longmont** | Joan Peck |
| **Louisville** | Ashley Stolzmann |
| **Lyons** | Connie Sullivan |
| **Mead** | Colleen Whitlow |
| **Morrison** | Debora Jerome |
| **Nederland** | Kristopher Larsen |
| **Northglenn** | Joyce Downing |
| **Parker** | John Diak |
| **Sheridan** | Sally Daigle |
| **Silver Plume** | Vacant |
| **Superior** | Rita Dozal |
| **Thornton** | Adam Matkowsky |
| **Westminster** | Herb Atchison |
| **Wheat Ridge** | Joyce Jay |

**Governor's Nonvoting Appointees to the DRCOG Board**

| | |
|---|---|
| Colorado Department of Transportation | Debra Perkins-Smith |
| Office of the Governor | Adam Zarrin |

**RTD Nonvoting Appointee to the DRCOG Board**

| | |
|---|---|
| Regional Transportation District | Bill Van Meter |

**Regional Transportation Committee**
(November 2016)

**Colorado Department of Transportation**

| | |
|---|---|
| Shailen Bhatt | Executive Director |
| Shannon Gifford | Transportation Commission |
| Ed Peterson | Transportation Commission |
| Gary Reiff | Transportation Commission |

**Regional Transportation District**

| | |
|---|---|
| David Genova | General Manager |
| Claudia Folska | Board of Directors |
| Tina Francone | Board of Directors |
| Jeff Walker | Board of Directors |

**Denver Regional Council of Governments**

| | |
|---|---|
| Jennifer Schaufele | Executive Director |
| Elise Jones | Board of Directors |
| Ron Rakowsky | Board of Directors |
| Bob Roth | Board of Directors |
| Ashley Stolzmann | Board of Directors |

**Other Members**

| | |
|---|---|
| Mizraim Cordero | Denver Metro Chamber of Commerce |
| Jeff Kullman | Move Colorado |
| Ken Lloyd | Regional Air Quality Council |

**Transportation Advisory Committee**
(November 2016)

| | |
|---|---|
| Heather Balser | City of Louisville |
| Hank Braaksma | Non RTD Transit |
| David Chambers | City of Aurora |
| Caryn Champine | City and County of Denver |
| John Cotten | City of Lone Tree |
| Kimberly Dall | City of Brighton |
| Steve Durian | Jefferson County |
| Janice Finch | City and County of Denver |
| Gregory Fischer | Freight |
| David Gaspers | City of and County of Denver |
| George Gerstle | Boulder County |
| Travis Greiman | City of Centennial |
| Art Griffith | Douglas County |
| Ted Heyd | TDM/Non-motorized |
| Mark Imhoff | Colorado Department of Transportation |
| Paul Jesaitis | Colorado Department of Transportation |
| Steve Klausing | Business |
| Sylvia Labrucherie | Denver Regional Mobility and Access Council |
| Richard Leffler | Town of Frederick |
| Ken Lloyd | Regional Air Quality Council |
| Bob Manwaring | City of Arvada |
| Johnny Olson | Colorado Department of Transportation |
| Debra Perkins-Smith | Colorado Department of Transportation |
| Rick Pilgrim | HDR |
| Tom Reed | Aviation |
| Doug Rex | Denver Regional Council of Governments |

**Non Voting Members**

| | |
|---|---|
| Darin Allan | Federal Transit Administration |
| Bill Haas | Federal Highway Administration |

# LIST OF ACRONYMS

| | |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| ADA | Americans with Disabilities Act |
| AFB | Air Force Base |
| APE | Annual Program Evaluation (RTD FasTracks) |
| APCD | Air Pollution Control Division |
| AQCC | Air Quality Control Commission |
| ATIS | Advanced traveler information systems |
| ATMS | Advanced transportation management systems |
| BNSF | BNSF Railway |
| BRT | Bus rapid transit |
| CAA | Clean Air Act |
| CAB | Colorado Aeronautical Board |
| CBD | Central Business District |
| CDOT | Colorado Department of Transportation |
| CDPHE | Colorado Department of Public Health and Environment |
| CFRT | Colorado Front Range Trail |
| CMAQ | Congestion Mitigation and Air Quality |
| CO | Carbon monoxide |
| DEIS | Draft Environmental Impact Statement |
| DIA | Denver International Airport |
| DMS | Dynamic Message Sign |
| DRIR | Denver Rock Island Railroad |
| DRCOG | Denver Regional Council of Governments |
| DRMAC | Denver Regional Mobility and Access Council |
| DUS | Denver Union Station |
| EA | Environmental Assessment |
| E&D | Elderly and disabled |
| EIS | Environmental impact statement |
| EJ | Environmental Justice |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FAST Act | Fixing America's Surface Transportation Act |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FONSI | Finding of No Significant Impact |
| FTA | Federal Transit Administration |
| GA | General aviation |
| GHG | Greenhouse gas emissions |
| GWR | Great Western Railway |
| HOT | High occupancy toll |
| HOV | High occupancy vehicle |
| HUTF | Highway Users Tax Fund |
| ITS | Intelligent Transportation Systems |
| JARC | Job Access and Reverse Commute |
| LRT | Light rail transit |
| MAP-21 | Moving Ahead for Progress in the 21st Century |
| MP | Milepost |
| MPO | Metropolitan Planning Organization |

| | |
|---|---|
| MRA | Major regional arterial |
| MVRTP | Metro Vision Regional Transportation Plan |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NHS | National Highway System |
| $NO_x$ | Nitrogen oxides |
| NPL | National Priorities List |
| PCEA | Programmatic Cumulative Effects Analysis |
| PEIS | Programmatic Environmental Impact Statement |
| PEL | Planning and Environmental Linkage |
| $PM_{10}$ | Particulate matter less than 10 microns in size |
| PMT | Person-miles of travel |
| Ppm | Parts per million |
| RAMP | Responsible Acceleration of Maintenance and Partnerships |
| RAQC | Regional Air Quality Council |
| RASP | Regional Aviation System Plan |
| ROD | Record of Decision |
| RPP | Regional Priority Program |
| RRS | Regional Roadway System |
| RTC | Regional Transportation Committee |
| RTD | Regional Transportation District |
| RTP | Regional Transportation Plan |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act - A Legacy for Users |
| SGPI | Shortgrass Prairie Initiative |
| SH | State Highway |
| SIP | State Implementation Plan |
| $SO_2$ | Sulfur Dioxide |
| SOV | Single occupant vehicle |
| STIP | Statewide Transportation Improvement Program |
| STP | Surface Transportation Program |
| TAC | Transportation Advisory Committee |
| TANF | Temporary Assistance for Needy Families |
| TAP | Transportation Alternatives Program |
| TAZ | Transportation analysis zone |
| TCM | Transportation control measure |
| TCSP | Transportation and Community System Preservation |
| TDM | Travel demand management |
| TIP | Transportation Improvement Program |
| TOD | Transit-oriented development |
| TMA | Transportation management area |
| TMO/A | Transportation management organization/association |
| TSM | Transportation systems management |
| UGB/A | Urban growth boundary/area |
| UP or UPRR | Union Pacific Corp. |
| UPWP | Unified Planning Work Program |
| US FWS | U.S. Fish and Wildlife Service |
| USC | United States Code |
| VMT | Vehicle miles traveled |
| VOC | Volatile Organic Compounds |
| YOE | Year of Expenditure |

**LIST OF KEY AGENCY WEBSITES**

**Air Pollution Control Division (APCD):** www.colorado.gov/airquality/

**Colorado Department of Transportation (CDOT):** www.codot.gov/

**Denver Regional Council of Governments (DRCOG):** www.drcog.org

**Federal Highway Administration (FHWA):** www.fhwa.dot.gov

**Federal Transit Administration (FTA):** www.fta.dot.gov

**Regional Air Quality Council (RAQC):** www.raqc.org

**Regional Transportation District (RTD):** www.rtd-denver.com

**U.S. Census Bureau:** www.census.gov/

**U.S. Department of Transportation:** www.dot.gov/

**U.S. Environmental Protection Agency (EPA):** www.epa.gov