

AGENDA
BOARD OF DIRECTORS
WEDNESDAY, DECEMBER 19, 2018
6:30 – 8:30 p.m.
1001 17TH STREET
ASPEN-BIRCH CONFERENCE ROOM

1. 6:30 Call to Order
2. Pledge of Allegiance
3. Roll Call and Introduction of New Members and Alternates
4. Move to Approve Agenda

STRATEGIC INFORMATIONAL BRIEFING

5. 6:35 Presentation on Water and Growth Dialogue
(Attachment A) Matt Mullica, Keystone Policy Center
6. 6:50 Report of the Chair
 - Report on Regional Transportation Committee
 - Report on Performance and Engagement Committee
 - Report on Finance and Budget Committee
7. 6:55 Report of the Executive Director
8. 7:00 Public Comment

Up to 45 minutes is allocated now for public comment and each speaker will be limited to 3 minutes. If there are additional requests from the public to address the Board, time will be allocated at the end of the meeting to complete public comment. The chair requests that there be no public comment on issues for which a prior public hearing has been held before this Board. Consent and action items will begin immediately after the last speaker.

TIMES LISTED WITH EACH AGENDA ITEM ARE APPROXIMATE
IT IS REQUESTED THAT ALL CELL PHONES BE SILENCED
DURING THE BOARD OF DIRECTORS MEETING. THANK YOU

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



9. 7:20 Community Spotlight
• City of Golden

CONSENT AGENDA

10. 7:30 Move to Approve Consent Agenda
• Minutes of November 28, 2018
(Attachment B)

ACTION ITEMS

11. 7:35 Discussion of adding \$125,000 of STP-Metro in FY2019 to TIP project 2016-058, reducing the total set-aside funds for air quality modeling in FY2020 in the draft 2020-2023 TIP by the same amount
(Attachment C) Robert Spotts, Senior Transportation Planner, Transportation Planning and Operations
12. 7:45 Discussion of Policy on State Legislative Issues
(Attachment D) Rich Mauro, Senior Policy and Legislative Analyst
13. 7:55 Discussion of Fixing America's Surface Transportation (FAST) Act Safety Targets
(Attachment E) Jacob Riger, Long Range Transportation Planner, Transportation Planning & Operations

INFORMATIONAL BRIEFINGS

14. 8:05 Presentation on 2017 Annual Report on Traffic Congestion in the Denver Region
(Attachment F) Robert Spotts, Senior Transportation Planner, Transportation Planning & Operations
15. 8:15 Committee Reports
The Chair requests these reports be brief, reflect decisions made and information germane to the business of DRCOG
- A. Report on State Transportation Advisory Committee – Elise Jones
 - B. Report from Metro Mayors Caucus – Herb Atchison
 - C. Report from Metro Area County Commissioners – Roger Partridge
 - D. Report from Advisory Committee on Aging – Jayla Sanchez-Warren
 - E. Report from Regional Air Quality Council – Doug Rex
 - F. Report on E-470 Authority – Ron Rakowsky
 - G. Report on FasTracks – Bill Van Meter

INFORMATIONAL ITEMS

16. 2018-2021 Transportation Improvement Program Administrative Modifications
(Attachment G) Todd Cottrell, Senior Transportation Planner, Transportation Planning & Operations

INFORMATIONAL ITEMS (cont.)

17. Relevant clippings and other communications of interest
 (Attachment H)
 Included in this section of the agenda packet are news clippings which specifically mention
 DRCOG. Also included are selected communications that have been received about DRCOG
 staff members.

ADMINISTRATIVE ITEMS

18. Next Meeting – January 16, 2019
19. Other Matters by Members
20. 8:30 Adjourn

CALENDAR OF FUTURE MEETINGS

December 2018

18	Regional Transportation Committee	Cancelled
19	Finance and Budget Committee	6:00 p.m.
19	Board of Directors	6:30 p.m.
21	Advisory Committee on Aging	Cancelled

January 2019

2	Board Work Session	4:00 p.m.
2	Performance and Engagement Committee	5:30 p.m.*
15	Regional Transportation Committee	8:30 a.m.
16	Finance and Budget Committee	6:00 p.m.
16	Board of Directors	6:30 p.m.
18	Advisory Committee on Aging	Noon – 3 p.m.
28	Transportation Advisory Committee	1:30 p.m.

February 2019

6	Board Work Session	4:00 p.m.
6	Performance and Engagement Committee	5:30 p.m.*
15	Advisory Committee on Aging	Noon – 3 p.m.
19	Regional Transportation Committee	8:30 a.m.
20	Finance and Budget Committee	6:00 p.m.
20	Board of Directors	6:30 p.m.
25	Transportation Advisory Committee	1:30 p.m.

*Start time for this meeting is approximate. The meeting begins at the end of the preceding Board Work Session

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
303-480-6701 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Strategic Informational Briefing	5

SUBJECT

Final report from the Water and Growth Dialogue efforts.

PROPOSED ACTION/RECOMMENDATIONS

No action requested, this item is for information only.

ACTION BY OTHERS

N/A

SUMMARY

Matt Mulica, Policy Facilitator for Keystone Policy Center, will present the results of the Water and Growth Dialogue efforts, which DRCOG has participated in for the past 4 years. The Colorado Water and Growth Dialogue began as an effort of Colorado State University's Colorado Water Institute and Keystone Policy Center to explore the potential to utilize land use planning to reduce water demand from population growth. As an initial step a large group was convened in August 2014 to have a round table conversation about what data and information was needed, whether and how it could be effective and to solicit interest. Matt will present the highlights and conclusions of the report.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

N/A

ATTACHMENTS

Water and Growth Dialogue presentation

Link: [Colorado Water and Growth Dialogue Final Report](#)

ADDITIONAL INFORMATION

If you need additional information, please contact Douglas W. Rex, Executive Director, at 303-480-6701 or drex@drcog.org or Flo Raitano, Director of Partnership Development and Innovation, at 303-480-6789 or fraitano@drcog.org.



Outline

- Collaborators
- Goals of the project
- Clarion Report
- Residential Density Impacts on Water Demand
- Residential Land Use and Water Demand Tool
- Strategic levers

Collaborators

Funders

Colorado Water Conservation Board
 Denver Water
 Gates Family Foundation
 Lincoln Institute of Land Policy
 National Science Foundation
 Walton Family Foundation

Steering Committee

Greg Fisher – Denver Water
 Tom Gougeon – Gates Family Foundation
 Peter Pollock – Lincoln Institute of Land Policy
 Ray Quay – Arizona State University, Decision Center
 for a Desert City
 Flo Raitano – Denver Regional Council of Governments
 Kevin Reidy – Colorado Water Conservation Board
 Marc Waage – Denver Water
 Lyle Whitney – City of Aurora
 Matthew Mulica (facilitator) – Keystone Policy Center

Technical support:

Don Elliott – Clarion Associates
 Mitch Horrie - Denver Water
 Daniel Jerrett - DRCOG
 Ralph Marra - SW Water Resources Consulting
 Justin Martinez - DRCOG
 David Sampson - DCDC ASU
 Jeremy Stapleton - Sonoran Institute
 Summer Waters - Sonoran Institute

Working Group:

Clark Anderson - Community Builders
 Drew Beckwith - Western Resources Advocates
 Susan Daggett - Rocky Mountain Land Use Institute
 Tom Cech - One World One Water Center
 Mizraim Cordero - Denver Metro Chamber of Commerce
 Barry Gore - Adams County Economic Development

Working Group (con't):

Steve Gordon - City of Denver
 Peter Grosshuesch - Town of Breckenridge
 Karen Hancock - City of Aurora
 Julio Iturreria - Arapahoe County
 Peter Kenney - Civic Results/Metro Mayors' Caucus
 Mara MacKillop - Colorado Water Conservation Board
 Becky Mitchell - Colorado Water Conservation Board
 Gene Myers - New Town Builders
 Chuck Perry - Perry Rose, LLC
 Greg Peterson - Colorado Ag Water Alliance
 Ben Rubertis - Genus Architecture
 Jeff Tejral - Denver Water
 Chris Treese - Colorado River District
 Heidi Williams - City of Thornton
 Susan Wood - Denver Regional Transportation District/CO APA

A Growing Opportunity

- By 2050, Colorado's population is projected to double, greatly increasing the demand for water.
- Colorado is already a water short state.
- By 2050, most people will live in buildings that are yet to be built.
- To date, there has been little integration of land and water planning

The Colorado Water and Growth Dialogue

"If we grow the next 5 million people like we grew the first, there won't be enough water"

"Before we spend the political capital required to reduce landscaping and increase density, we need to know whether these things will move the needle"

Goals:

- Demonstrate how much water can be saved through the integration of water and land use planning;
- Develop a consensus-based set of recommended strategies;
- Provide local communities with data, information and a tool box of strategies so that they may make better informed decisions

Clarion Report

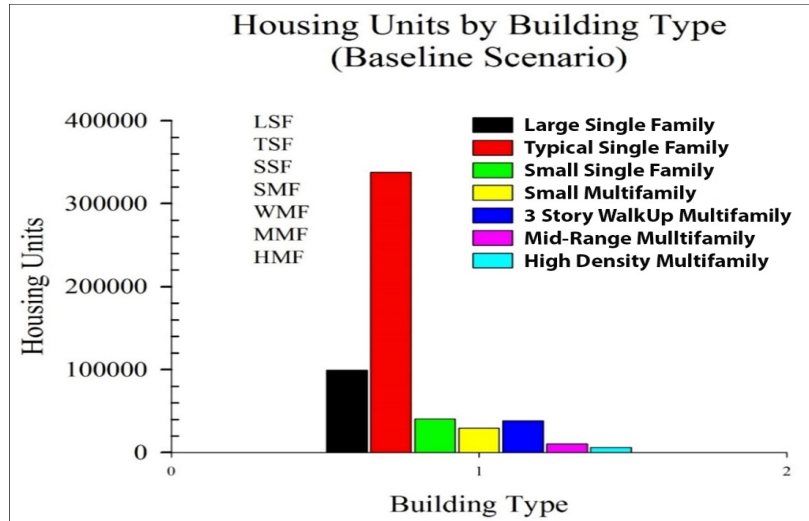
- Clarion Associates developed a report that identified existing studies linking land use planning and water demand reduction, and suggested land use forms that might further that goal.
- The following 4 recommended land use pattern changes helped the dialogue focus on what to examine:
 - Land use patterns that are recommended for further examination
 - Build smaller single-family parcels
 - Changing from single-family to multifamily
 - Build denser multifamily
 - Enact landscape restrictions

<u>2010 Census</u>	<u>People per Square Mile</u>
New York	27,000
	26,000
	25,000
	24,000
	23,000
	22,000
	21,000
	20,000
	19,000
	18,000
San Francisco	17,000
	16,000
	15,000
	14,000
	13,000
Chicago	12,000
	11,000
	10,000
	9,000
Baltimore	8,000
	7,000
Denver Water Service Area 2050	6,000
St. Louis	5,000
Denver Water Service Area 2010	4,000
	3,000
	2,000
Nashville	1,000

Density

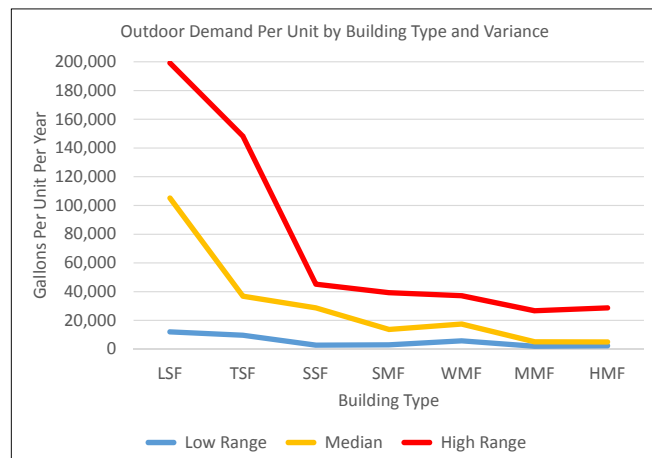


Allocation of Building Types 2040



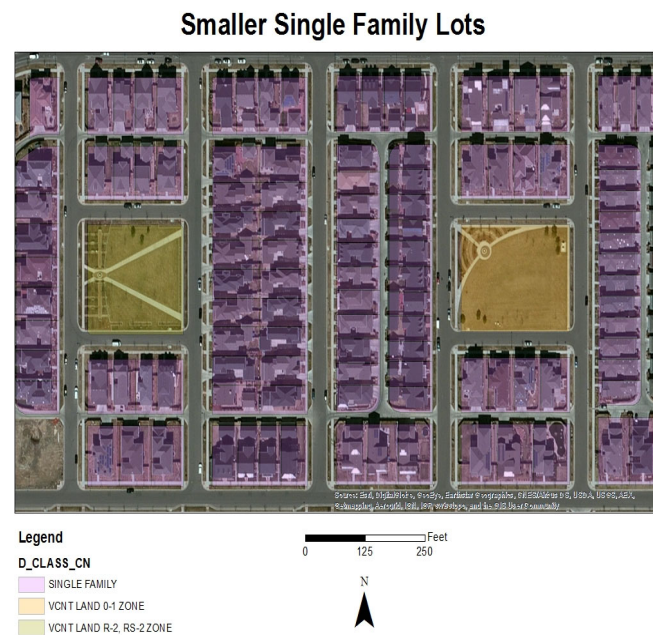
Strategic Insights- Density Increases

- Household movement from the **Large Single Family** and **Traditional Single Family** to any other building types provides the largest total water demand reductions of new housing and can result in 50% to 60% of the full potential from the more complex scenarios
- Scenarios that do not include LSF and TSF have little benefit.



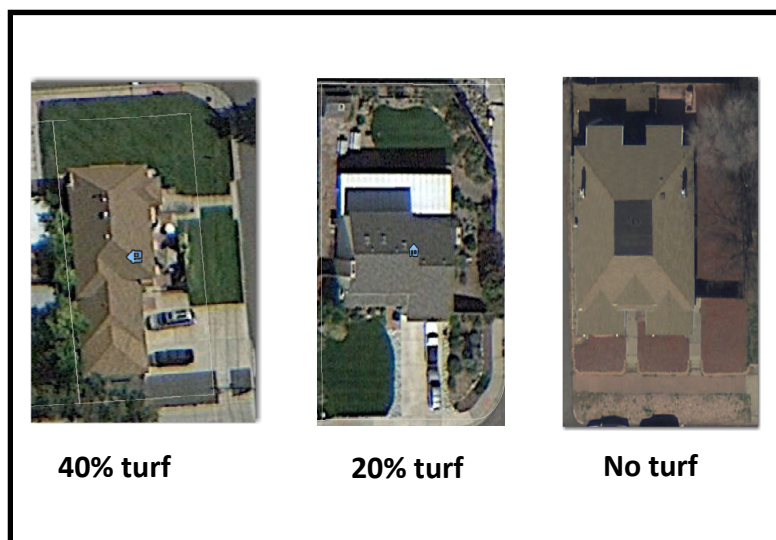
Strategic Insights – Density Increases

- Increasing density may decrease water demand of new growth in the range of 2% to 19%, with higher resource cost density increases associated with the higher (water) savings.
- Lower resource cost density increases may achieve 3% to 8% reduction for new housing.



Strategic Insights - Efficient landscaping

- Increasing the efficiency of irrigation may decrease water demand of new growth in the range of 5 to 25%, and be as effective, if not more, at reducing demand as increasing housing density.
- Combining low “resource cost” residential density increases with low “resource cost” reductions of irrigation may achieve reductions in total residential water demand of new growth by 5 to 15%.
- Education of homeowners is a critical step to achieving savings



Residential Land Use and Water Demand Tool

SECURITY WARNING: Macros have been disabled. Enable Content

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Key	Changeable User Input	Calculated Output
Table 1. Population Distribution by Product Type		
Scenario Name		
Total Population	100,000	100,000
Large Single Family Population	25,000	10,000
Typical Single Family Population	10,000	25,000
Small Single Family Population	25,000	10,000
Townhome Population	10,000	25,000
3-Story Walkup Population	5,000	20,000
Mid-Range Multifamily Population	5,000	5,000
High Density Multifamily Population	20,000	5,000
Table 2. User Assumptions		
Persons per Household		
Large Single Family		
Typical Single Family		
Small Single Family		
Townhome		
3-Story Walkup		
Mid-Range Multifamily		
High Density Multifamily		
Average Units per Acre		
Large Single Family		
Typical Single Family		
Small Single Family		
Townhome		
3-Story Walkup		
Mid-Range Multifamily		
High Density Multifamily		
Table 3. User Guides		
Units per Acre Guide		
Product Type Observations		
Large Single Family		
Typical Single Family		
Small Single Family		
Townhome		
3-Story Walkup		
Mid-Range Multifamily		
High Density Multifamily		
Seasonal Gallons per Square Foot Guide		
Seasonal GPCD (Previous)		
Inefficient for Bluegrass		
Efficient for Bluegrass		
Highly Efficient for Bluegrass/Some Xeriscape		
Xeriscape		
Little or No Seasonal Use		
Seasonal GPCD (Previous) Observations		
Large Single Family		
Typical Single Family		
Small Single Family		
Townhome		
3-Story Walkup		
Mid-Range Multifamily		
Table 4. Model Output		
Estimated Acres of Development	#DIV/0!	#DIV/0!
Previous Area Required (acres)	0	0
Annual Indoor Demand, AF	0	0
Annual Seasonal Demand, AF	0	0
Total Annual Demand, AF	0	0
Overall GPCD	0	0

Population & Product Type Model Guide to Product Types

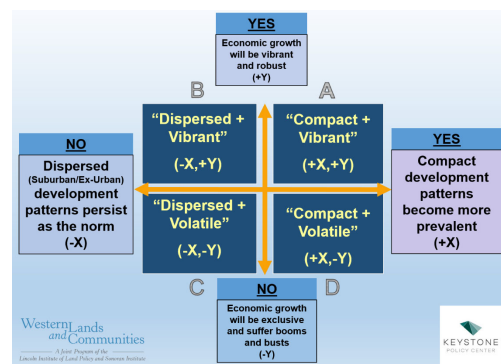
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Recommended Strategic Levers

How can changes in urban form and landscaping practices for new growth and redevelopment assist in meeting future urban water demand along the Colorado Front Range?

Strategies were tested to see how well they performed in a variety of plausible futures that varied in terms of future housing preferences, the strength of the economy, and innovations in transportation technology such as autonomous vehicles, which may either reinforce sprawling land use patterns or help in concentrating residential development along transit corridors.

The strategies that worked well across the range of futures were selected for further consideration.



Recommended Strategic Levers

- Encourage the consideration of higher residential densities as a means to reduce water demand
- Adopt landscaping policies to lower future water demand from population growth
- Incorporate a One Water approach into planning
- Incorporate aspects of water planning into long range planning



Recommended Strategic Levers

- Share success stories and case studies
- Develop, track, and refine new metrics that link water use to land use
- Encourage water smart development through a suite of new local development standards and incentives
- Develop water smart design guidelines and standards for government-owned buildings, public spaces and rights-of-way





ATTACH B

MINUTES
BOARD OF DIRECTORS
WEDNESDAY, NOVEMBER 28, 2018

Members/Alternates Present

Herb Atchison, Chair	City of Westminster
Eva Henry	Adams County
Jeff Baker	Arapahoe County
Elise Jones	Boulder County
David Beacom	City and County of Broomfield
Randy Wheelock	Clear Creek County
Nicholas Williams	City and County of Denver
Jolon Clark (Alternate)	City and County of Denver
Roger Partridge	Douglas County
Tina Francone (Alternate)	Jefferson County
Bob Fifer	City of Arvada
Bob Roth	City of Aurora
Larry Vittum	Town of Bennett
Aaron Brockett	City of Boulder
Margo Ramsden	Town of Bow Mar
Roger Hudson	City of Castle Pines
George Teal	Town of Castle Rock
Tammy Maurer	City of Centennial
Laura Christman	City of Cherry Hills Village
Rick Teter	City of Commerce City
Steve Conklin	City of Edgewater
Daniel Dick	City of Federal Heights
Lynette Kelsey	Town of Georgetown
Jim Dale	City of Golden
George Lantz (Alternate)	City of Greenwood Village
Stephanie Walton	City of Lafayette
Dana Gutwein	City of Lakewood
Larry Strock (Alternate)	Town of Lochbuie
Wynne Shaw	City of Lone Tree
Ashley Stolzmann	City of Louisville
Barney Dreistadt (Alternate)	Town of Lyons
Joyce Palaszewski	Town of Mead
John Diak	Town of Parker
Sally Daigle	City of Sheridan
Mark Lacis	Town of Superior
Jessica Sandgren	City of Thornton
Bud Starker	City of Wheat Ridge
Debra Perkins-Smith	Colorado Department of Transportation
Bill Van Meter	Regional Transportation District

Others Present: Douglas W Rex, Executive Director, Connie Garcia, Executive Assistant, DRCOG; Steve O'Dorisio, Kristin Sullivan, Adams County; Bryan Weimer, Josh Tenneson, Roger Harvey, Arapahoe County; Arvada; Mac Callison, Aurora; Scott McCarey, Boulder County; Kim Groom, Sarah Grant, Broomfield; Brad Boland, Castle Rock; Michelle Halstead, Joe Wilson, Commerce City; Justin Begley, Denver; Jamie Hartig, Art Griffith, Douglas County; Carolyn Scharf, Federal Heights; Steve Durian, Jefferson County; Kent Moorman, Thornton; Heather McKillop, Louis Cripps, RTD; Danny Herrmann, CDOT; Ed Bowditch, Jennifer Cassell, Bowditch & Cassell; and DRCOG staff.

Chair Herb Atchison called the meeting to order at 6:30 p.m. with a quorum present.

Move to approve agenda

Director Vittum **moved** to approve the agenda. The motion was **seconded** and **passed** unanimously.

Report of the Chair

- The Regional Transportation Committee met and discussed items on the Board agenda.
- Director Diak reported the Performance and Engagement Committee forwarded proposed amendments to the Rules of Conduct document to the Board for action, and selected Ron Rakowsky to serve on the Nominating Committee.
- Director Stolzmann reported the Finance and Budget Committee authorized the Executive Director to execute contracts for planimetric data, funding for aging services providers, and a sublease of the office space at 1290 Broadway. The committee selected Elise Jones to serve on the Nominating Committee
- Chair Atchison recognized Administrative Officer Roxie Ronsen for her service to DRCOG over the last 40-plus years.

Report of the Executive Director

- Executive Director Rex reported the Dec 5 Performance and Engagement Committee and Board Work Session are cancelled.
- A save the date was provided for the Apr 10, 2019 Awards Event. Nominations for awards are now open.
- Winter Bike to Work Day is Feb 8, 2019.
- The Area Agency on Aging is seeking proposals for the next grant cycle of funding for senior services. Mandatory training for proposers are scheduled for Dec 12 (in person) and a webinar on Dec 14. Submittals are due Jan 11, 2019
- The deadline for UC/STAMP projects has been extended to Dec 7.
- DRCOG recently hosted an Association of Metropolitan Planning Organizations Connected and Autonomous Vehicle best practices exchange.
- DRCOG is exploring hosting a quarterly city/county manager meeting. The purpose would be to discuss upcoming DRCOG programs and actions and share products and services DRCOG offers. It would also provide an opportunity for them to meet and discuss common interests.

Public comment

No public comment was received.

Community Spotlight

Lynette Kelsey, Georgetown, provided information on the town's history and projects currently underway. The Bighorn Crossing development broke ground this summer. There will be 60 townhomes and 70 apartments in three buildings. A micro-hotel and brewpub are also being added. Upgrades to water and wastewater facilities are also underway.

The Town of Golden was selected to provide the next Community Spotlight presentation.

Move to approve consent agenda

Director Fifer **moved** to approve the consent agenda. The motion was **seconded** and **passed** unanimously.

Items on the consent agenda included:

- Minutes of the October 17, 2018 meeting

Discussion of selection of member to the Nominating Committee

Directors Conklin and Teal volunteered to serve on the Nominating Committee.

Director Fifer **moved** to close nominations. The motion was **seconded**. The motion **passed** unanimously.

Director Teal **moved** to appoint Steve Conklin to represent the Board of Directors on the Nominating Committee. The motion was **seconded** and **passed** unanimously.

Chair Atchison selected George Teal to serve on the Nominating Committee. The Nominating Committee members are Bob Roth, Nicholas Williams, Elise Jones, Ron Rakowsky, Steve Conklin and George Teal.

Discussion of 2019 DRCOG Budget

Jenny Dock, Accounting Services Manager, provided a brief overview of the proposed budget. Director Stolzmann expressed appreciation to staff for the transparency of the process and efforts to diversify program funding.

Director Starker **moved** to adopt a resolution approving the 2019 DRCOG Budget. The motion was **seconded** and **passed** unanimously.

Discussion of Rules of Conduct amendment

Doug Rex provided information on the process for amending the rules of conduct document. Director Diak noted the Performance and Engagement Committee discussed these amendments over a period of months. Director Christman proposed the words

“serves as a director on a corporate, company or not-for profit board which would have a financial interest or gain” be added to the definition of “substantial interest.”

Director Stolzmann **moved** to approve the amended DRCOG Board of Directors Rules of Conduct, subject to legal review of modifications added herein. The motion was **seconded** and **passed** unanimously.

Discussion of FAST Act transit asset management targets

Jacob Riger, Long Range Transportation Planning Manager, and Louis Cripp, Regional Transportation District, provided an overview of the FAST Act targets for transit asset management.

Director Brockett **moved** to approve the proposed targets for transit asset management as part of the performance-based planning requirements of the *Fixing America's Surface Transportation* (FAST Act). The motion was **seconded** and **passed** unanimously.

Discussion of 2020-2023 Transportation Improvement Program Regional Share Projects

Todd Cottrell, Senior Transportation Planner, provided a brief update on the Regional Share Call for Projects. Sponsors of the projects proposed for inclusion provided brief overviews of their projects.

Director Jones **moved** to approve Regional Share projects and ranked order waiting list to be included in the draft 2020-2023 TIP with Regional Share funds. The motion was **seconded**. There was discussion.

Members discussed the projects proposed for funding and the waiting list at length. Comments were made on the various projects. Notably, comments on the 16th Street Mall project related to cost of project, amount of funding request, status of project design, status of matching funds, materials to be used in the project, and the ability to expend the funds in a timely manner.

Director Partridge offered a **substitute motion** to fund the top eight projects on the list as proposed, remove the 16th Street Mall project from the waiting list, and leave the remainder of the waiting list as is. The substitute motion was **seconded**. Members continued discussion of the projects. After discussion, the substitute motion **passed** with 20 in favor and 12 opposed.

Presentation on Go-Tober

Celeste Stragand, Way to Go Program Manager, provided a brief overview of the success of Go-Tober. Ms. Stragand listed the winners of the business challenges.

Committee Reports

State Transportation Advisory Committee – Director Jones reported the STAC discussed distribution of Regional Priority Program funds.

Metro Mayors Caucus – Director Atchison noted the MMC discussed transportation funding with Governor-elect Polis.

Metro Area County Commissioners – No report was provided.

Advisory Committee on Aging – No report was provided.

Regional Air Quality Council – Doug Rex reported the RAQC continued discussion of the work program and budget and discussed sending a letter of support for the proposed low emission vehicle rulemaking.

E-470 Authority – Director Diak reported the E-470 Authority approved a partnership with Arapahoe County on land to build an interchange at Quincy.

Report on FasTracks – Director Van Meter reported the RTD FasTracks committee did not meet.

Next meeting – **December 19, 2018**

Other matters by members

No other matters were discussed.

Adjournment

The meeting adjourned at 10:08 p.m.

Herb Atchison, Chair
Board of Directors
Denver Regional Council of Governments

ATTEST:

Douglas W. Rex, Executive Director

ATTACH C

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
303 480-6701 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Action	11

SUBJECT

The Regional Air Quality Council (RAQC) is requesting the addition of \$125,000 of STP-Metro funds in FY2019 to meet an accelerated schedule for ozone modeling requirements in the Denver region, reducing their set-aside funding from FY2020 in the draft *2021-2023 Transportation Improvement Program* (TIP) by the same amount.

PROPOSED ACTION/RECOMMENDATIONS

DRCOG staff recommends approval of the proposed TIP amendment allowing the RAQC to begin critical ozone modeling operations.

ACTION BY OTHERS

[November 19, 2018](#) – TAC recommended approval

[November 27, 2018](#) – RTC recommended approval

SUMMARY

The RAQC is the lead air quality planning agency for the Denver Metro area and the lead air quality planning agency for ozone in the North Front Range area. The RAQC tracks the region's ozone levels, evaluates and recommends emission control measures to the Colorado Air Quality Control Commission (AQCC), and implements a variety of strategies designed to increase public awareness of the causes and solutions for ozone pollution in close coordination with the Colorado Air Pollution Control Division (APCD). They are also responsible for developing the Denver Metro/North Front Range (DM/NFR) region's air quality attainment plans. Creating an ozone State Implementation Plan (SIP) incorporates developing emission inventories, evaluating and modeling emission control strategies, and adopting enforceable regulations and control measures. A SIP must be approved by the AQCC and the U.S. Environmental Protection Agency (EPA), with review by the Colorado state legislature.

Ground-level ozone is formed when emissions from everyday items and industrial sources combine and “cook” in the heat and sunlight. Common sources of ozone forming emissions include gasoline and diesel-powered vehicles and lawn equipment, local industry, power plants, oil and gas production, and household paints, stains, and solvents.

At ground level, ozone is a health hazard, especially for the young and elderly and people with pre-existing respiratory conditions, such as asthma and Chronic Obstructive Pulmonary Disease(COPD). Those who are active and exercise outdoors may also experience breathing difficulties and eye irritation, and prolonged exposure may result in reduced resistance to lung infections and colds.

In 2007, under the 1997 National Ambient Air Quality Standard (NAAQS), the 9-county DM/NFR region was designated as Marginal nonattainment for exceeding the ozone standard of 80 parts per billion (ppb). In 2008, the ozone standard was tightened to 75 ppb by the EPA to be more protective of human health. In 2012, the DM/NFR region was designated as Marginal nonattainment under the newer standard, with the 1997 standard eventually being revoked, and in 2016, the region was reclassified to a Moderate nonattainment area for failing to attain by the Clean Air Act mandated deadline. At the end of the 2018 ozone season, the DM/NFR region continued to fail to meet the ozone standard, which will likely result in a reclassification to a Serious nonattainment area in late 2019.

Meanwhile, in 2015, the ozone standard was further tightened by the EPA from 75 ppb to 70 ppb and the region was designated as a Marginal nonattainment area in July 2018 for the 2015 ozone standard. Due to a recent lawsuit, the newly established 2015 ozone standard does not revoke planning requirements associated with the 2008 standard. As a result, the RAQC and the Colorado APCD will be required to develop a Serious nonattainment area SIP for the 2008 standard at the same time as they begin modeling and planning for the 2015 standard.

Because of the failure to attain the 2008 standard in 2018 and the recent court decision preventing the EPA from revoking the 2008 ozone standard, a Serious Area SIP needs to be completed by the end of 2019 for AQCC approval in 2020. This will require developing new emissions inventories and Attainment Demonstration modeling for 2020, which had not been anticipated in the existing budget. Funds have already been set aside for RAQC ozone modeling and strategy analysis in the draft *2020-2023 Transportation Improvement Program (TIP)*. Adding funds in FY2019 will initiate an administrative TIP amendment to add \$125,000 of STP-Metro funds to TIP project *2016-058 Ozone State Implementation Plan (SIP) Modeling Study* and reduce the set aside funds in FY2020 in the draft *2020-2023 TIP* by the same amount. DRCOG currently has funds available to carry out the advance due to remaining balances from project returns.

The RAQC will present a summary of the 2018 ozone season and the regulatory requirements of being nonattainment for multiple ozone standards.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

Move to approve adding \$125,000 of STP-Metro in FY2019 to TIP project 2016-058, reducing the total set-aside funds for air quality modeling in FY2020 in the draft *2020-2023 TIP* by the same amount.

ATTACHMENTS

1. RAQC presentation
2. Link: [Regional Air Quality Council](#)

ADDITIONAL INFORMATION

If you need additional information please contact Douglas W. Rex, Executive Director, at 303 480-6701 or drex@drcog.org; or Robert Spotts, Senior Transportation Planner, Transportation Planning and Operations, at 303 480-5626 or rspotts@drcog.org.

Ozone Planning Update

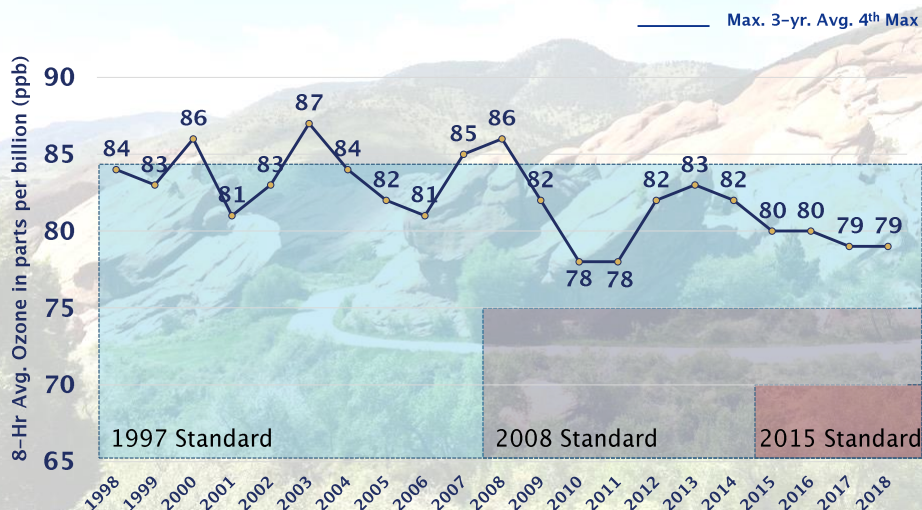
DRCOG – Board of Directors

December 19, 2018

Amanda Brimmer, E.I.T.
Technical Program Manager



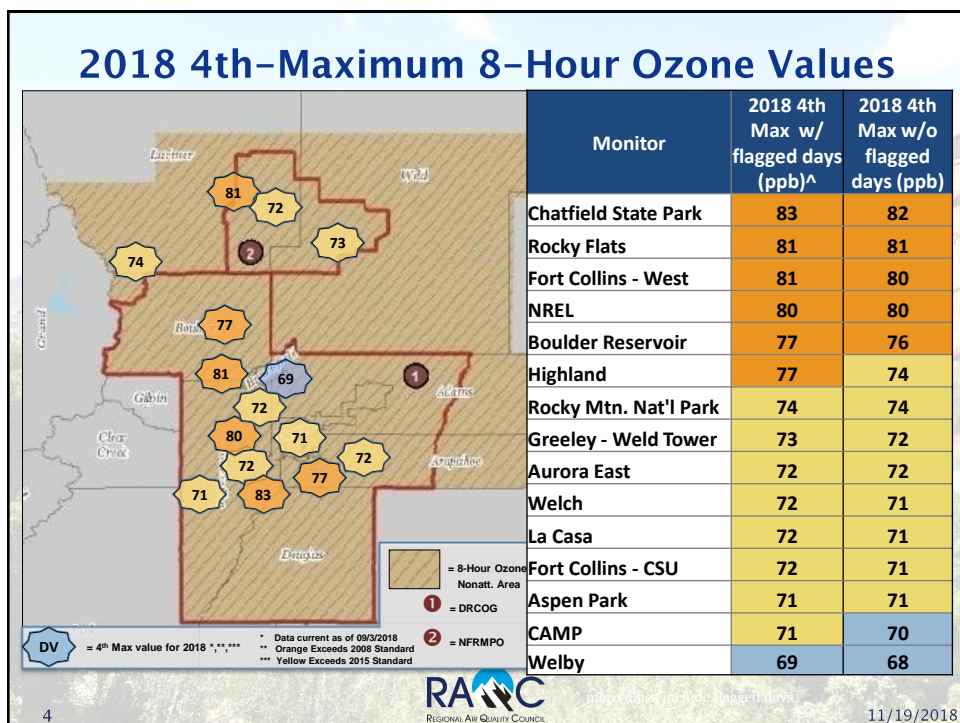
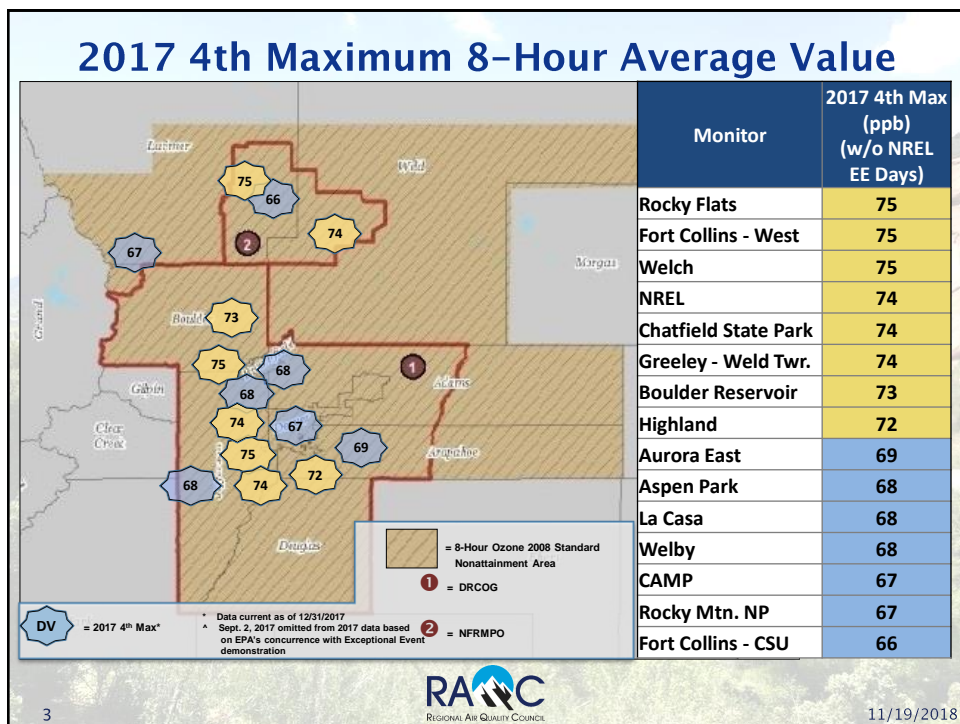
8-Hour Ozone Trends and Federal Standards 3-Year Design Values in the Denver Metro/North Front Range



8-Hour Ozone Standard: Based on a three-year average of the annual fourth-highest daily 8-hour maximum ozone concentration. Current as of 9/4/15.



11/19/2018



Potential Paths for 2008 Ozone Standard (75 ppb) 2017 vs. 2018

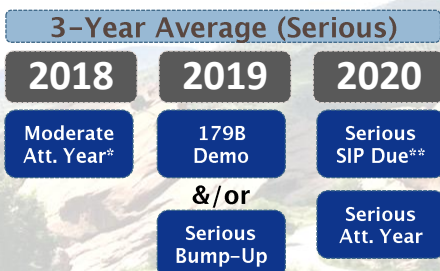
		End of:	
		2017	2018
2008 NAAQS Planning	Exceptional Event Demonstration	✓	✗
	Clean Data → 1-Year Extension	✓	✗
	Revocation of 2008 NAAQS	?	✗
	179B Demonstration	✗	?
	Serious Area Reclassification	✗	?

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11/19/2018

Ozone Planning Timeline - 75 Standard



Strategy Evaluation and Implementation

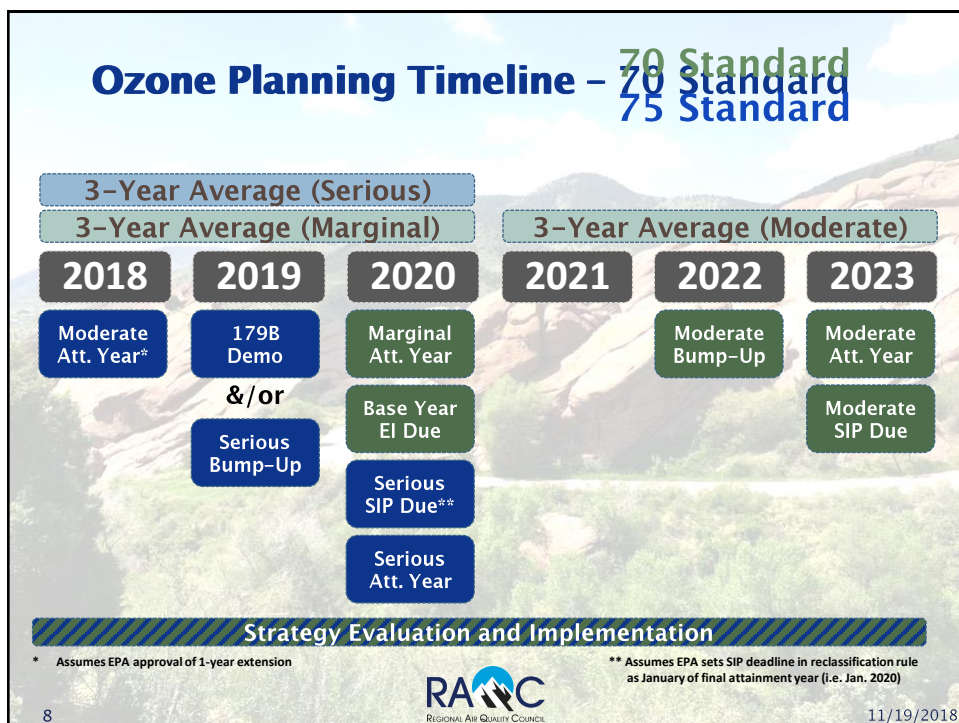
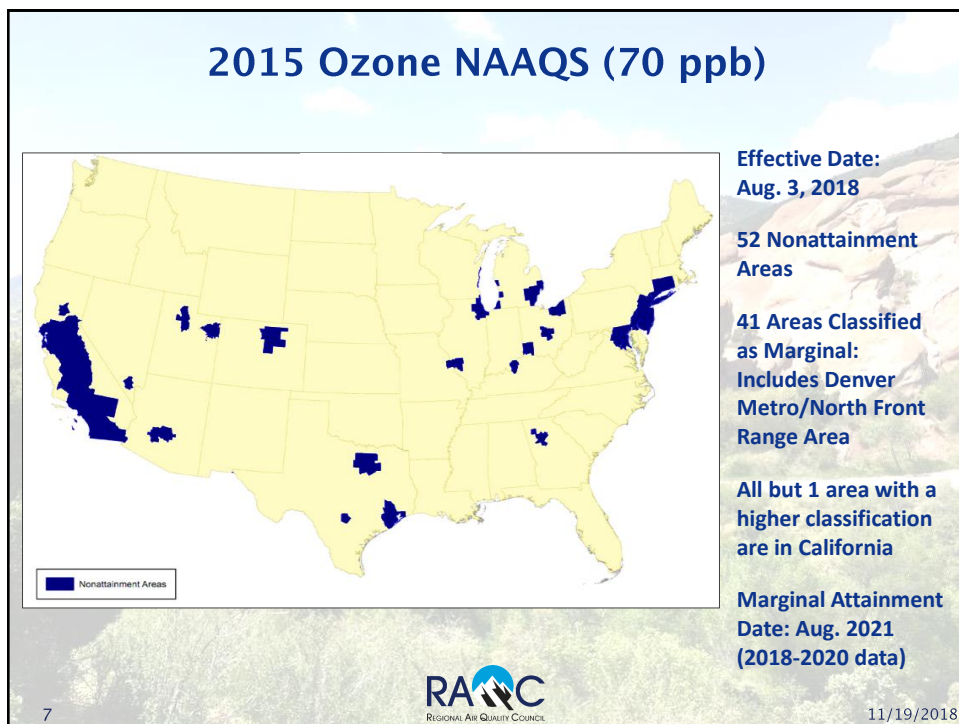
* Assumes EPA approval of 1-year extension

** Assumes EPA sets SIP deadline in reclassification rule as January of final attainment year (i.e. Jan. 2020)

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11/19/2018



Next Steps – Ozone Planning

Modeling and Emissions Inventory Development

- Base and future year emissions inventory development for 2015 standard
- New base year modeling platform and future year modeling for 2015 standard
- Potential Serious Area SIP development including 2020 Attainment Demonstration modeling on 2011 platform
- “What if” photochemical modeling scenarios to evaluate strategies
- Analysis of impact of international emissions

Strategy Analyses

- Low Reid Vapor Pressure (RVP) gasoline fuels study
- Low Emission Vehicles (LEV)/Zero Emission Vehicles (ZEV) standards
- Commercial lawn and garden equipment
- Low-volatile organic compounds (VOC) architectural and industrial maintenance (AIM) coatings and consumer products
- Additional oil and gas and stationary source control options

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 REGIONAL AIR QUALITY COUNCIL

11/19/2018

Funding Needs

	DRCOG (FY16-19)	DRCOG (FY20-23)	NFRMPO (FY22)	CDPHE (FY20-22)	RAQC	TOTAL
Current Funding Available	\$263,000	\$0	\$0	\$25,000	\$19,000	\$307,000
Anticipated Funding	\$0	\$215,000	\$25,000	\$118,000	\$0	\$358,000
TOTALS	\$263,000	\$215,000	\$25,000	\$143,000	\$19,000	\$665,000

	DRCOG (FY16-19)	DRCOG (FY20-23)	NFRMPO (FY22)	CDPHE (FY20-22)	RAQC	TOTAL
75 ppb Standard	\$28,000	\$53,000	\$0	\$75,000	\$19,000	\$175,000
70 ppb Standard	\$235,000	\$162,000	\$25,000	\$68,000	\$0	\$490,000
TOTALS	\$263,000	\$215,000	\$25,000	\$143,000	\$19,000	\$665,000

	DRCOG (FY16-19)	DRCOG (FY20-23)	NFRMPO (FY22)	CDPHE (FY20-22)	RAQC	TOTAL
75 ppb-by end of 2019	\$28,000	\$53,000	\$0	\$75,000	\$19,000	\$175,000
70 ppb-by end of 2019	\$235,000	\$72,000	\$0	\$0	\$0	\$307,000
Subtotal	\$263,000	\$125,000	\$0	\$75,000	\$19,000	\$482,000
70 ppb- in 2020+	\$0	\$90,000	\$25,000	\$68,000	\$0	\$183,000
TOTALS	\$263,000	\$215,000	\$25,000	\$143,000	\$19,000	\$665,000

Requesting \$125K advanced to 2019; FY20-23 funds reduced to \$475K.

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 REGIONAL AIR QUALITY COUNCIL

11/19/2018

Contact Information

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ATTACH D

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
(303) 480-6701, or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Action	12

SUBJECT

This item concerns approval of the *Draft 2019 Policy Statement on State Legislative Issues* and the Legislative Policy Statement

PROPOSED ACTION/RECOMMENDATIONS

Staff recommends approving the 2019 Policy Statement on State Legislative Issues and the Legislative Policy Statement.

ACTION BY OTHERS

N/A

SUMMARY

Each year, the Board adopts two policy statements on a range of specific state and federal legislative issues. These documents provide the DRCOG Board, staff and lobbyists with policy direction on legislative issues during the coming year.

Many of the staff proposed changes are editorial in nature to provide clarity or to make sure language is up-to-date. Proposed changes that are more substantive in nature, particularly in the Transportation section, are intended to better reflect current Board policies and program practices.

The draft *2019 Policy on Federal Legislative Issues* will be presented as an informational item to the Board at the January meeting.

PREVIOUS DISCUSSIONS/ACTIONS

The draft Policy Statement on State Legislative Issues was provided for review and comment at the November 28, 2018 meeting. No comment was received from Board members. Staff did receive a comment related to the Legislative Policy Statement and the suggested change is reflected in the attached draft.

PROPOSED MOTION

Move to approve the *2019 Policy Statement on State Legislative Issues* and the Legislative Policy Statement

ATTACHMENT

1. Draft 2019 Policy Statement on State Legislative Issues
2. Draft Legislative Policy Statement

ADDITIONAL INFORMATION

Should you have any questions regarding the draft policy statement, please contact Douglas W. Rex, Executive Director, at 303-480-6701, or drex@drcog.org; or Rich Mauro, Senior Legislative and Policy Analyst, at 303-480-6778 or rmauro@drcog.org.

Denver Regional Council of Governments 2019 Policy Statement on State Legislative Issues

INTRODUCTION

This paper outlines the key state policy issues of the Denver Regional Council of Governments (DRCOG). It identifies policy positions intended to inform the General Assembly, state executive branch officials and others as they develop and implement state policy on these issues. This policy statement guides positions and actions taken by the DRCOG Board, its staff and members during the 2018 state legislative session.

DRCOG is a membership organization of local elected officials representing 48 municipalities and nine counties in the Denver metro area. Under federal law, DRCOG serves as the metropolitan planning organization (MPO) coordinating transportation planning with air quality goals and serves as the Area Agency on Aging in eight counties to aid the 60-plus population. Under state statutes DRCOG, as the regional planning commission, prepares and adopts a regional plan for the metro area and has regional responsibility for oversight of transit projects and certain state-sponsored and private toll-road projects.

REGIONAL PLANNING AND DEVELOPMENT

Regional Planning

Regional growth and development is of significant concern for metro area residents, policymakers and community leaders. The counties and municipalities of the Denver region have been advancing a shared aspirational vision of the future of the metro area for more than 60 years. Working together to make life better for our communities and residents, that vision has taken various forms over the years—most recently as a regional plan known as Metro Vision.

Metro Vision fulfills DRCOG's statutory duty to make and adopt a regional plan for the physical development of the region's territory. The plan remains advisory for a local jurisdiction unless its planning commission chooses to adopt it as its official advisory plan under Colorado Revised Statutes 30-28-106(2). The current Metro Vision plan was most recently adopted by DRCOG's board of directors on April 18, 2018.

Metro Vision guides DRCOG's work and establishes shared expectations with our region's many and various planning partners. The plan outlines broad outcomes, objectives and initiatives established by the DRCOG board to make life better for the region's residents. Metro Vision is aspirational and long-range in focus, but it has historically served to inform nearer-term policies and initiatives.

The DRCOG board of directors recognizes that the success of the Metro Vision plan requires the coordinated efforts of local, state and federal governments; the business community; and other planning partners, including philanthropic and not-for-profit organizations.

DRCOG supports those efforts that contribute to the achievement of Metro Vision's regional outcomes and encourages state and regional entities to align their policies and investment decisions with Metro Vision and other regional agreements to advance shared objectives.

Metro Vision establishes 14 inter-related aspirational outcomes, which describe a future that DRCOG, local governments and its partners will work toward together. DRCOG may support or oppose legislative proposals based on their potential to impact the region's ability to achieve these outcomes and the associated performance measures, targets and action elements. These Metro Vision outcomes are as follows:

Outcomes – An efficient and predictable development pattern

- The region is comprised of diverse, livable communities.
- Through a coordinated effort between DRCOG and local communities, new urban development occurs in an orderly and compact pattern within regionally designated areas.
- Connected urban centers and multimodal corridors throughout the region accommodate a growing share of the region's housing and employment.

Outcomes – A connected multimodal region

- The regional transportation system is well-connected and serves all modes of travel.
- The transportation system is safe, reliable and well-maintained.

Outcomes – A safe and resilient natural and built environment

- The region has clean water and air, and lower greenhouse gas emissions.
- The region values, protects and connects people to its diverse natural resource areas, open space, parks and trails.
- The region's working agricultural lands and activities contribute to a strong regional food system.
- The risk and effects of natural and human-created hazards is reduced.

Outcomes – Healthy, inclusive and livable communities

- The built and natural environment supports healthy and active choices.
- The region's residents have expanded connections to health services.
- Diverse housing options meet the needs of residents of all ages, incomes and abilities.

Outcomes – A vibrant regional economy

- All residents have access to a range of transportation, employment, commerce, housing, educational, cultural and recreational opportunities.
- Investments in infrastructure and amenities allow people and businesses to thrive and prosper.

Metro Vision also includes numerous objectives and strategic initiatives that identify areas for continuous improvements and specific voluntary opportunities that DRCOG and our many partners can consider. To help track the region's progress toward our shared outcomes, the plan establishes a series of regional performance measures. **More information on the Metro Vision plan, including objectives and performance measures that may inform DRCOG's position on legislative proposals can be found on the DRCOG website (metrovision.drcog.org).**

Transit-oriented development

The residents of the Denver metro area have made a significant financial commitment to expand the region's rapid transit system. To maximize the benefit of this investment, the areas surrounding existing and future transit stations should be developed or redeveloped to include appropriate higher-density, mixed-use, pedestrian- and bicycle-oriented development that supports transit use.

DRCOG supports legislative initiatives that foster transit-oriented development, including but not limited to: a) providing the Regional Transportation District (RTD) with the ability to manage its park-and-ride facilities using best practices that help the region reduce vehicle miles traveled (VMT); b) expanding the ability of RTD and local governments to enter into joint-development agreements; and c) protecting local authority to use tax-increment financing to leverage development in areas around transit stations.

Local land use authority and planning

Local comprehensive/master plans provide a framework for the exercise of local land use authority. They form the basis for local growth and development decisions. **DRCOG supports the use of comprehensive/master plans as the foundation for local land use decision-making.**

Private property rights

DRCOG respects private property rights within a legal context that protects local land use authority and emphasizes that governmental actions often add value to private property. While acknowledging that there are concerns over a potential for inappropriate uses of that authority, DRCOG believes that U.S. Supreme Court decisions defining constitutional restrictions on local government regulation of private property are adequate to protect both public and private rights. When these restrictions are coupled with established precedents of the Colorado Supreme Court, protections accorded to landowners are reasonable, appropriate and balanced. Therefore, **DRCOG opposes further restrictions on the ability of governmental entities to regulate private property for the benefit of the public and opposes takings and eminent domain legislation that goes beyond the existing rulings of the U.S. Supreme Court and the Colorado Supreme Court as an attempt to unconstitutionally restrict local land use authority.**

Planning data and technical support

DRCOG recognizes the importance of unbiased, reliable and consistent data in effective local and regional planning and decision-making. DRCOG also collaborates with the state to provide a variety of planning and technical assistance services to small communities. **DRCOG encourages the General Assembly and state agencies to further support efforts that would provide local governments with planning tools, technical assistance and other resources needed to enhance local and regional decision-making. DRCOG supports legislation that ensures readily available access to public data sets, including digital data, for use in planning analysis.**

Housing

An adequate supply and mix of housing options continues to be a concern of local governments. Housing choices allow individuals and families to find desirable housing that is affordable and accessible in communities throughout the region, allowing them to stay in their community of choice as their economic or life circumstances change. A range of housing options across the region benefits both individuals and families and can improve the economic vitality and diversity of local communities.

DRCOG supports the following principles pertaining to the quality, quantity and affordability of housing in the Denver metro area:

- policies and programs that support the private and public sectors in the creation and maintenance of an adequate supply of affordable rental and ownership options and providing a variety of housing sizes and types integrated with the community to meet the needs of people of all ages, incomes, and abilities
- regional approaches to addressing the affordable housing issue that incentivize local efforts, particularly as they relate to preservation of existing affordable housing stock
- an adequate supply of permanently affordable housing located near job and transit hubs and continued public- and private-sector support for such an effort
- increased state financial support for loan and grant programs for low- and moderate-income housing, including associated amenities that promote access to opportunity
- collaboration among public and private entities, including efforts to develop loan programs and address the jobs-housing connections
- renters and homeowners (including manufactured home owners) have appropriate protections from discrimination and displacement. Policies should emphasize the rights of residents and minimize disparities in treatment under the law.
- actions to provide more accessible and obtainable housing options for seniors

TRANSPORTATION

Transportation planning

Federal and state laws and regulations establish a critical role for the metropolitan planning organization (MPO) in the transportation planning process. Congress has emphasized the importance of local government involvement, through the designated regional planning agency, in selecting projects and prioritizing funding for transportation. **DRCOG supports the process established between DRCOG, the Regional Transportation District (RTD) and the Colorado Department of Transportation (CDOT) to address the following issues before final adoption of the Statewide Transportation Plan and will evaluate state legislative and administrative actions for consistency with this process:**

- the distribution of estimated future transportation revenues and the range of certainty regarding estimated funding allocations
- rules and criteria for determining regional transportation project selection, including system preservation projects as well as immediate and future transportation priorities based on the Regional Transportation Plan

- a dispute-resolution process to mediate disputes related to these requirements

The synergy between transportation and land use affects the region's growth and development, use of transportation facilities and environmental quality. A coordinated approach between the state and regional transportation systems' planning efforts and local project development is crucial to ensure environmental compatibility, efficient system performance and cost-effective solutions. Although individual local governments can take actions to address these issues in their own jurisdictions, a regional approach to addressing them also is necessary. **DRCOG supports early and frequent consultations between state, regional and local agencies to coordinate regionwide system and project planning efforts, as well as to coordinate transportation, land use and air quality planning efforts. DRCOG will evaluate state legislative and administrative actions for consistency with this policy.**

Role of the MPO

The interdependence of transportation systems in metropolitan areas, particularly in the context of population growth and its demands on resources, necessitates a regional approach to transportation problem solving. As the MPO for the Denver metro area, DRCOG is responsible for planning and programming funds for a regional multimodal transportation system. The role of the MPO and the importance of cooperation among transportation agencies are recognized in federal law and regulation. The MPO serves as the forum for collaborative decision-making on regional transportation issues and brings together decision-makers from local governments, other regional agencies and state transportation agencies to consider strategic and innovative solutions.

The critical role of the MPO needs to be recognized and supported at the state level. Consensus between state and regional transportation agencies also is critical. **DRCOG supports the following principles with regard to the role of the MPO:**

- transportation planning that is coordinated between DRCOG, CDOT, RTD and local communities, with each participating transportation agency's plan recognizing the region's priorities in the context of statewide transportation priorities
- a strong role for MPOs placing them on equal footing with CDOT and applicable regional transit agencies in selecting projects to be funded to ensure that local, regional and state transportation needs are met in a coordinated and cooperative manner
- legislation that reinforces collaboration between state and regional transportation agencies and recognizes their respective roles, responsibilities and interests
- legislation to ensure that representation on the Transportation Commission reflects approximately equal populations based on the most recent population census

Transportation financing

Colorado and the Denver metro area face serious funding shortages for meeting their transportation needs. Regional and statewide analyses show existing revenue sources are inadequate to maintain current infrastructure, let alone address congestion, provide multimodal options desired by the public, address needs in agricultural and energy-impacted areas, and ensure safe travel throughout the

state. The region's long-term economic vitality requires a built environment that includes effective and convenient transportation options. Colorado and the metro area need a revenue system that is reliable and sufficient to maintain the existing transportation system in good condition and to invest in the system to keep pace with population growth. Thus, enhancements to existing revenue sources and the enactment of new revenue sources are necessary.

DRCOG supports the following principles and actions to meet transportation financing needs:

- Increase funding for transportation to preserve the system, address congestion and safety, and provide multi-modal options for people of all ages, incomes and abilities.
- Reduce or eliminate off-the-top appropriations from the Highway Users Tax Fund.
- Consider alternative revenue and financing mechanisms, such as VMT-based fees, and, under certain circumstances, tolling and congestion pricing of existing roadways.
- Provide an appropriate share of new or increased revenues back to local governments.
- Consider the effects of land use decisions on transportation infrastructure needs.
- Protect and expand the authority of regions to implement regional financing tools.
- Where appropriate, support the use of managed lanes, including tolled express lanes, to help drivers reliably anticipate travel time on major corridors in the Denver metropolitan area. Retain the requirement that any road, highway or tolled lane within or affecting the Denver metro area be reviewed and approved by the DRCOG board for inclusion in the fiscally constrained regional transportation plan. Ensure toll receipts remain in the regional highway system that is being tolled.
- Allow toll receipts to be used for multimodal improvements and accumulated for system reconstruction.
- Allocate federal and state funds to achieve funding equity statewide based on justified needs (system preservation, congestion and multimodal options) and contribution to overall revenues.
- Re-examine state formulas and procedures to ensure an adequate amount of federal and state funds are made available to urbanized and metropolitan areas to relieve congestion, increase safety, and achieve and maintain air quality standards.
- Consider revising the responsibilities for maintenance and supervision of the non-National Highway System portions of the current state highway system, subject to the condition that any devolution to local governments be accompanied by the funding necessary to avoid unfunded mandates and pursuant to review by, and consent of, affected local and regional agencies.

Multimodal transportation

Efforts to address transportation needs in the region must draw upon an array of transportation modes to reduce single-occupant vehicle demand and to provide a variety of transportation choices.

DRCOG strongly believes multimodal travel options are imperative to preserve and enhance our quality of life. DRCOG supports legislation that promotes efforts to fund, maintain and expand a multimodal transportation system. DRCOG also supports measures to improve safety for users of alternative modes, especially pedestrians and bicyclists. DRCOG supports

funding for programs that provide transportation for access to jobs for low-income workers who cannot afford to live near where they work, and for safe routes to schools.

Coordination of regional and statewide transportation efforts

The DRCOG area generates a significant number of trips throughout the state of Colorado. At the same time, residents from throughout Colorado travel to, and through, the metro area. Coordination of transportation planning and funding efforts between DRCOG and neighboring councils of governments, transportation planning regions and coalitions, especially in the primary north-south (Interstate 25) and east-west (Interstate 70) corridors will provide mobility and economic benefits not just for the DRCOG region but for the entire state. Regional consensus through the existing planning processes is critical for defining large-scale projects in the state's major transportation corridors, establishing their priorities, and broadening the base for their funding. **DRCOG supports regional and statewide efforts to enhance consensus-building among partners and will work to pursue multimodal transportation solutions. DRCOG supports using the regional and statewide transportation planning processes to explore and identify transportation solutions and will evaluate state legislative and administrative actions for consistency with this policy.**

Advanced mobility

Rapidly changing technology is revolutionizing transportation mobility. From dockless scooters and e-bikes (electric bicycles) to the potential for connected and automated vehicles, the transportation sector is undergoing a rapid and uncharted evolution toward mobility on demand and mobility as a service. In 2018, DRCOG participated in Mobility Choice Blueprint – a one-of-a-kind planning and funding partnership among CDOT, DRCOG, RTD and the Denver Metro Chamber of Commerce to help the Denver region identify how to best prepare for the era of advanced mobility. Through the Mobility Choice Blueprint process, DRCOG has identified leadership opportunities in the areas of advanced mobility governance and data management. As the MPO, DRCOG coordinates the region's transportation planning process among DRCOG, CDOT and RTD. Advanced mobility represents a natural extension of DRCOG's MPO role as the region implements and expands the Mobility Choice Blueprint process. Similarly, the cooperative and collaborative data management essential to the region's successful integration of new and emerging transportation technologies will be facilitated by DRCOG's experience leading the Denver Regional Data Consortium and creating or serving as a repository of numerous land use, transportation, traffic, GIS and other data sets. **DRCOG encourages the General Assembly and state agencies to support efforts to provide local governments with planning tools, technical assistance and the other resources necessary to prepare for new and emerging transportation technologies.**

Transportation demand management

Transportation demand management programs, projects and services can help reduce congestion and improve air quality by decreasing the amount of automobile traffic during high-demand periods. DRCOG sees transportation demand management as an important element of the region's long-

range growth management and transportation planning strategy. **DRCOG supports the following principles and programs to promote transportation demand management efforts:**

- a coordinated regionwide effort (Way to Go) to promote and encourage adoption of non-single-occupant-vehicle (non-SOV) travel options
- active transportation to encourage healthier travel choices, including bicycling and walking
- transit
- telecommuting, flextime and other changes to normal work patterns to avoid peak traffic conditions
- carpooling, vanpooling and other forms of ridesharing including the underlying technologies to facilitate matches
- encouraging parents to use carpools for taking students to school and infrastructure that facilitates these transportation options
- non-automobile infrastructure investments by the state, counties and cities
- employer promotion of alternative mode use by employees
- coordination of transportation alternatives wherever traffic congestion occurs, such as at schools, large retail shopping centers and in connection with sporting or cultural events or major transportation infrastructure construction
- incentives to individuals who use alternative modes

Safe and effective management of the transportation system

Efforts to promote the effective day-to-day operational management of the freeway and arterial road systems and transit facilities are important to making the best use of existing transportation investments. **DRCOG supports approaches that make use of the roadways and transit facilities more efficient, including collaborative programs for incident management and intelligent transportation systems. DRCOG supports efforts that improve or expand situational awareness for transportation operators and supports their ability to both effectively manage transportation systems and distribute real-time traveler information.**

DRCOG's board-adopted Metro Vision plan includes a safety performance measure to reduce the number of traffic fatalities to fewer than 100 annually by 2040. Additionally, the board will focus its investments in the next Transportation Improvement Program on improving the safety and security of the transportation system. **DRCOG supports efforts to improve the safety of the traveling public – drivers, transit riders, pedestrians and bicyclists. DRCOG supports educational, enforcement and engineering approaches that enhance safety to reduce crashes, serious injuries and fatalities. These include approaches to optimize the multimodal transportation system to improve the safe and reliable flow of people and goods such as incident management, safety education and awareness, driver safety measures and other measures proven to enhance safety.**

Transportation for older adults and vulnerable populations

Access to transportation is critical for older adults and individuals with disabilities, low incomes, veterans and other vulnerable populations. Transportation allows them to obtain health care, food and to maintain and increase social, family and other life-sustaining relationships. DRCOG promotes the concept of regional cooperation and coordination among counties and local service providers to most effectively use the limited resources available for transportation for older adults and other vulnerable populations. **DRCOG supports the following:**

- a system that:
 - ensures more and better service is provided to older adults and vulnerable populations
 - reduces administrative and service duplication
 - increases coordination among funding sources, providers, jurisdictions and trips
 - efficiently uses taxpayer dollars to provide life-sustaining mobility
- increased state funding for general and Medicaid transportation services for older adults and other vulnerable populations

OLDER ADULTS AND INDIVIDUALS WITH DISABILITIES

As the designated Area Agency on Aging (under the federal Older Americans Act) for Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Gilpin and Jefferson counties, DRCOG advocates, plans, funds and coordinates the provision of services for older adults. DRCOG also has been designated as an Aging and Disability Resource Center (ADRC) under the Affordable Care Act and in that capacity is charged with providing a coordinated and streamlined access point to long-term care services and supports for adults age 60 and over or age 18 and over living with a disability, and their caregivers. As an advocate for older adults, individuals with disabilities, veterans and their caregivers, DRCOG works with various agencies, groups and individuals to support state legislation, regulations and programs to meet their needs. DRCOG also provides the direct services of a long-term care ombudsman and information, referral and assistance. In performing these roles, **DRCOG supports the following:**

Planning and delivery of services

The federal Older Americans Act and the state Older Coloradans Act mandate critical roles for area agencies on aging: planning and developing programs and services to meet the needs of older adults; advocating for and representing the issues and concerns of older adults; and distributing federal and state funds to service providers. As an ADRC, DRCOG is directed to provide older adults, individuals with disabilities, and their caregivers with information and assistance about available resources and options counseling. DRCOG works with the state, other government agencies, consumers, service providers, private and nonprofit organizations, and foundations to identify needs for services and then brings the parties together to determine the preferred approaches to address these needs. **DRCOG supports state legislative and regulatory provisions reinforcing collaboration between the state and area agencies on aging and respecting their respective roles and interests, consistent with state and federal laws. DRCOG supports collaboration and**

partnerships to better meet service needs consistent with DRCOG's responsibilities as an Area Agency on Aging and an ADRC, including policies, projects, programs and funding to improve data collection and analysis of cost effectiveness.

Funding

Colorado and the Denver metro area face serious funding shortages related to economically and socially needy older adults, individuals with disabilities and their caregivers in the region. Regional and statewide assessments show that existing revenue sources are insufficient to meet current needs for services such as home modifications, meals, transportation to medical appointments and health promotion. Thus, enhancements to existing sources and development of more reliable sources are necessary. **DRCOG supports:**

- increased funding for programs and exploration of programs providing services to older adults, individuals with disabilities, veterans and their caregivers, especially services that support individuals continuing to live independently in their homes and communities
- efforts to use state funds for programs that provide prescription drugs more efficiently and effectively, including efforts to increase pricing transparency and reduce the costs of purchasing such prescription drugs to enable associated programs to better serve their growing caseloads
- increasing the appropriations to the State Funding for Senior Services line item in the Long Bill. This includes increasing the continuing appropriation to the Older Coloradans Cash Fund, as well as any additional state general fund monies that might become available. DRCOG specifically supports a stable, long-term funding source that increases to meet the growing need for services, which would provide a level of funding certainty that would improve yearly program planning for needed services.
- action by the General Assembly to fully fund the required share to match federal funds available to the state through the Older Americans Act, including the National Family Caregiver Support Program, so as not to require an increase in the required local share. Such state or local shares or matches should not be required to come from existing program funds.
- distributing State Funding for Senior Services monies, including the Older Coloradans Cash Fund, using the existing structure created to administer Older Americans Act funds. DRCOG also supports the equitable distribution of federal and state funds to area agencies on aging based on the needs and contribution of each region.
- re-examination of state procedures and distribution formulas for federal and state funds to ensure adequate funds are available to urbanized areas to meet the needs of older adults

Long-term care

Older adults receiving long-term care services, including those living in long-term care communities (such as nursing homes and assisted living facilities) and those enrolled in the Program of All-Inclusive Care for the Elderly (PACE) are some of the most vulnerable members of the regional community. As the operator of the Long-Term Care Ombudsman Program for the region, DRCOG is an advocate for the rights of residents and quality of care for those in long-term care communities and

participants in PACE. **DRCOG supports increases in the quality of care and consumer protections for older adults and their caregivers and, in particular, legislation strengthening the role of the long-term care ombudsman and PACE ombudsman as resident and consumer advocates. DRCOG urges the state, when making decisions regarding funding for long-term care programs, to structure such funding to protect the quality of care for residents and participants, including funding for optimal ombudsman staffing.**

Housing

Available, affordable and accessible housing is a particular concern of older adults and individuals with disabilities, who mostly live on fixed incomes. However, an equally critical concern is the ability to live independently as part of the larger community. As individuals age or experience disability, the availability of in-home and related services that enable them to remain in their homes becomes increasingly important. Growing evidence indicates older adults and individuals with disabilities are healthier and require fewer costly services when they have affordable and accessible housing choices, are provided with the ability to age in place, remain connected to the community and its networks, and have access to long-term care. **DRCOG supports:**

- increased funding and regulatory changes that improve the availability of supportive services, while maintaining consumer protections for clients and family caregivers
- property tax relief to help reduce a tax liability that especially burdens low-income seniors and older adults on fixed incomes
- policies, programs and services that preserve existing affordable housing stock, promote access to a variety of housing options in diverse geographic locations, and provide consumer protections that enable older adults and individuals with disabilities to age in place

Driver safety and older adults

As individuals age, their ability to drive safely may diminish. However, DRCOG is concerned that addressing this issue solely based on age imposes undue hardships on older residents who can drive safely. When older residents are not allowed to drive, the availability of transportation for medical appointments, grocery shopping and social activities is essential for seniors to maintain independence. **DRCOG supports functional assessments of driving ability rather than age cut-off as the basis for imposing limitations on driving by individuals. DRCOG supports adequate funding for providing transportation services for the elderly and individuals with disabilities.**

ENVIRONMENT

Air quality

Air quality affects all residents of the region and continues to be a concern. The region fails to meet current federal standards for ozone and more stringent standards are expected to be established by the Environmental Protection Agency. Meeting a more aggressive ozone standard will require continuous efforts from many parties. **DRCOG supports:**

- efforts to reduce emissions from all sources sufficient to meet federal air quality standards
- transportation and land use strategies that improve air quality in the region
- alternative fuel sources and clean-burning technology and provision of infrastructure and services for alternative fuels
- incentives for purchasing high fuel economy or alternative fuel vehicles or for accelerated retirement of inefficient or high-polluting personal, commercial or fleet vehicles that are beyond repair
- offering services, including incentives that encourage and facilitate the use of alternative modes of travel
- examination of the potential of select speed limit reductions

Water supply

An adequate, dependable supply of water is necessary for urban, agriculture, recreation and open-space priorities both in the Denver metro area and throughout the state. Metro Vision calls for maximizing the wise use of water resources through efficient land development and other strategies. **DRCOG supports:**

- collaborative efforts among local governments, water providers and other stakeholders to promote water conservation
- data collection and research to increase understanding of the link between land development and water demand, and best practices to promote the efficient use of water resources across the region
- water resource planning, management and development within the existing constitutional framework and pursuant to the basin roundtables process established in the Colorado Water for the 21st Century Act (HB 05-1177), in which interbasin compacts are negotiated for the equitable distribution of the state's waters
- water reuse as one component in efforts to meet water supply needs and thus supports efforts to facilitate the reuse of water consistent with Colorado's constitutional water rights system
- policies and practices that, consistent with local government authority, protect Colorado's water resources
- the development of Colorado's Water Plan that emphasizes conservation, storage, drought mitigation and streamlining of the regulatory processes, aligns the state's various water efforts and provides a benchmark for future collaboration in addressing Colorado's water supply needs

Open space

Open space resources available to citizens in the Denver metro area are important to our quality of life. **DRCOG supports:**

- planning, acquisition, protection and preservation of open space resources
- increasing funding for open space preservation

- Great Outdoors Colorado and other efforts advancing major land acquisitions along the Front Range that link open spaces in the metro area to protect canyons and river corridors, the mountain backdrop and prominent geographic features, freestanding community buffer areas, and the east metro plains

INTERGOVERNMENTAL RELATIONS

Intergovernmental cooperation

The state government, local governments and regional agencies all provide critical services and implement programs for the benefit of Colorado residents. Legislative bodies and executive agencies at each level should respect the roles and responsibilities of the others. **DRCOG supports building consensus among state, local and regional entities in developing and implementing new and existing programs and improved approaches to planning and service provision.**

Shared services

Many of the services provided by local governments to their residents are also provided by neighboring communities. To address related coordination and funding concerns, local governments have entered into agreements with each other and with DRCOG for shared-service delivery. **DRCOG encourages local governments to enter into shared-services agreements and supports efforts to ensure such agreements are honored and endorsed by the state.**

State-regional relations

As the state's policy issues become more complex, it is evident that the solutions are not one-size-fits-all. The Denver metro area has made significant progress in developing collaborative solutions and decision-making processes for several complex issues with which it has been confronted — especially in the related areas of growth and transportation. As the regional planning commission, the metropolitan planning organization for transportation, and the Area Agency on Aging, DRCOG is in a unique position to convene parties of interest on intergovernmental issues, provide the necessary forum for their resolution and facilitate a negotiated outcome. **In recognition of the importance of regionalism, it is an appropriate role for DRCOG to act as a facilitator of regional approaches. Consequently, it is appropriate for state agencies to ensure that actions they take affecting the region are consistent with regionally derived solutions and the adopted Metro Vision plan.**

Regional service delivery

The state plays an important role in the funding of public services and programs administered at the regional and local levels. When making such funding and programmatic decisions, it is appropriate for state agencies and the General Assembly to consider which programs are most appropriately implemented at the local and regional level. State administration of federal programs can be problematic for local governments, as state agencies tend to be more removed from clients and less responsive to their needs. On the other hand, individual local governments may lack the resources to achieve desired efficiencies and cost-effectiveness. Also, some programs are most appropriately

and effectively addressed at the regional level. The collaborative partnerships typical of regional approaches can provide the critical mass of users and clients for services or programs to be cost-effective. **DRCOG urges the state, when making funding and programmatic decisions, including creating new programs or changing existing programs, to consider the following principles:**

- use existing local or regional service delivery systems wherever practical
- ensure a consultative process among federal, state and local governments and regional councils before making changes to services currently being delivered at the local or regional level
- ensure existing levels of services are maintained and adequate administrative funds are provided to implementing agencies
- ensure the state treats the continuity of service delivery as a key principle guiding any actions to create new programs or revise existing programs by respecting the local and regional programs already in existence

BOARD PRINCIPLES GUIDING DRCOG LEGISLATIVE POSITIONS

The Denver Regional Council of Governments' federal and state Legislative Program is defined by the character of the Denver region and the concerns of its local governments. The Denver region constitutes a unique area as distinguished from the rest of the state because its member governments comprise a large and highly urbanized population.

In the Denver region, the regional council, organized as a voluntary association of county and municipal governments, is the only regional spokesman for these entities. Due to DRCOG's regional character and local government orientation, the council is the appropriate forum for regionally focused legislative activity.

This self-imposed limitation to regional issues is reinforced by the activities of ~~two~~three other organizations, the Colorado Municipal League (CML) ~~and~~- Colorado Counties, Inc. (CCI), and Colorado Counties Acting Together (CCAT). As statewide associations of municipal and county governments respectively, their interests are correspondingly broad. As a consequence, they address the entire range of local government issues before the state legislature, state executive and regulatory agencies, and the federal government. Both associations generally avoid issues that are unique to an individual community or region.

In addition to regional issues, DRCOG is concerned with issues that affect the organization or its programs. The organization assumes the responsibility for identifying and promoting the regional interest in its various fields of planning and management to state and federal legislative and administrative bodies.

It is not the policy of the Legislative Program to address all legislative/administrative issues of interest to local governments generally. Support of or opposition to a bill or legislative funding measure will be given, and be subject to reassessment, according to the bill's or measure's consistency with DRCOG's adopted principles, policies and plans. Where appropriate, DRCOG will strive to collaborate with other organizations representing local government(s), such as CCI and CML.

DRCOG's legislative activity generally will be focused on the following types of issues:

1. Proposals of special significance to the Denver region;
2. Proposals that would have a unique effect upon local governments in this region;
3. Proposals that affect DRCOG as an agency or which would affect one or more of its programs.

ATTACHE

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
303 480-6701 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Action	13

SUBJECT

Setting 2019 safety targets as part of the performance-based planning requirements of the *Fixing America's Surface Transportation* (FAST) Act.

PROPOSED ACTION/RECOMMENDATIONS

Staff recommends approval of the proposed 2019 safety targets shown below and in Attachment 2 for the DRCOG Transportation Management Area.

ACTION BY OTHERS

[November 19, 2018](#) – TAC recommended approval

[November 27, 2018](#) – RTC recommended approval

SUMMARY

The FAST Act requires state DOTs and MPOs to annually set targets and report on progress towards achieving those targets for several topics in support of a performance-based approach to transportation planning and programming. These topics include safety, infrastructure (pavement and bridge condition), system performance, and transit asset management. DRCOG has until February 2019 to set and report its 2019 safety targets to CDOT. The proposed 2019 targets are:

Safety Measures	2019 Targets (2015-2019 Five Year Averages)
• Number of fatalities	256
• Rate of fatalities (<i>per million VMT</i>)	0.93
• Number of serious injuries	1,935
• Rate of serious injuries (<i>per million VMT</i>)	6.97
• Number of combined non-motorized fatalities and serious injuries	344

The proposed fatality-related safety targets are based on the “Metro Vision” methodology and serious injury-related targets are based on the “hold the line” methodology used to set the 2018 targets last year. At the November Board meeting, staff will review the proposed 2019 safety targets and methodologies. As a reminder, FAST Act safety targets are prescribed by federal regulations to be short-term and pragmatic. Accordingly, staff will also provide an overview of DRCOG’s upcoming Vision Zero Action Plan.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

Move to adopt a resolution approving the proposed 2019 safety targets for the DRCOG Transportation Management Area as required by the FAST Act.

ATTACHMENT

1. Staff presentation
2. Draft resolution

ADDITIONAL INFORMATION

If you need additional information please contact Douglas W. Rex, Executive Director, at 303 480-6701 or drex@drcog.org; or Jacob Riger, Long Range Transportation Planning Manager at 303 480-6751 or jriger@drcog.org



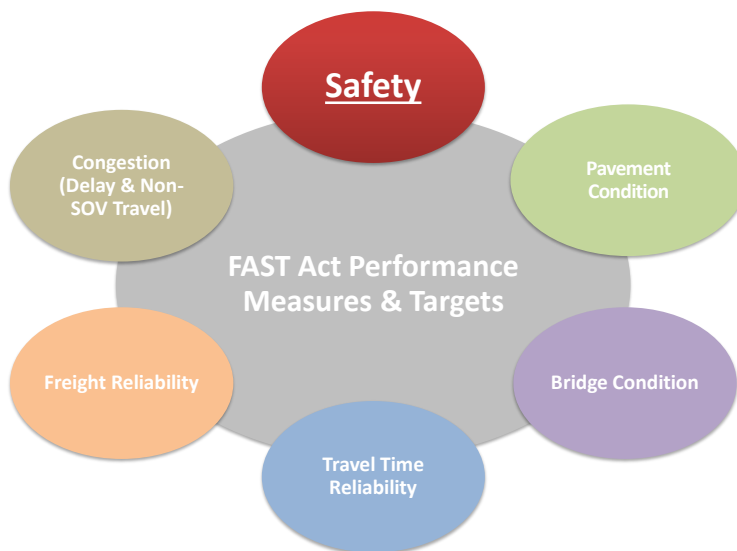
Presented by:
Jacob Riger, AICP

Board – December 19, 2018

FAST Act 2018 Safety Target Progress and Recommended 2019 Safety Targets



Required Performance Measure Topics





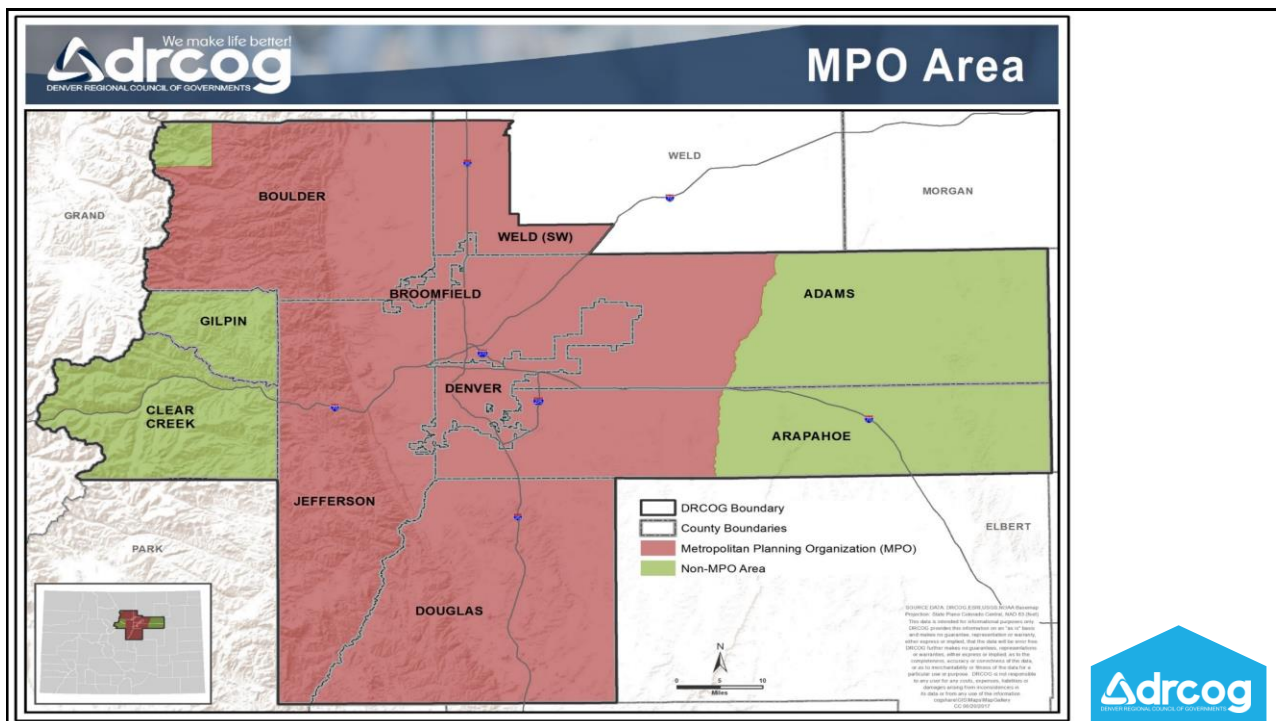
Annual Safety Target Setting

Measure Area

Performance Measures

Safety

- Number of fatalities
- Fatalities per million vehicle miles traveled
- Number of serious injuries
- Serious injuries per million vehicle miles traveled
- Number of non-motorized fatalities and non-motorized serious injuries





2018 Safety Targets Review

2018 SAFETY TARGETS (2014-2018 Five Year Average)		METHODOLOGY	TARGET
1	DRCOG FATALITIES	METRO VISION	242
2	DRCOG FATALITY RATE PER 100 MILLION VMT	METRO VISION	0.90
3	DRCOG SERIOUS INJURIES	HOLD THE LINE	1,948
4	DRCOG SERIOUS INJURY RATE PER 100 MILLION VMT	HOLD THE LINE	7.20
5	NON-MOTORIZED FATALITIES AND SERIOUS INJURIES	METRO VISION (fatalities) + HOLD THE LINE (serious injuries)	59 + 287 = 346



2018 Fatality and Fatality Rate Target Setting Methodology Recap

“METRO VISION” SAFETY TARGET SETTING METHODOLOGY

Regional Objective 5: Operate, manage and maintain a safe and reliable transportation system.

Performance Measures

Measure	Where are we today? (Baseline)	Where do we want to be? (2040 Target)
Non-single occupant vehicle (Non-SOV) mode share to work	25.1 percent (2014)	35.0 percent
Daily vehicle miles traveled (VMT) per capita	25.5 daily VMT per capita (2010)	10.0 percent decrease from 2010
Average travel time variation (TTV) (peak vs. off-peak)	1.22 (2014)	Less than 1.30
Daily person delay per capita	6 minutes (2014)	Less than 10 minutes
Number of traffic fatalities	185 (2014)	Fewer than 100 annually

64% REDUCTION TO HIT 2040 TARGET

DRCOG TMA Fatalities	DRCOG TMA Fatalities 5 Year Moving Average	Year	DRCOG TMA Fatality Rate	DRCOG TMA Fatality Rate 5 Year Moving Average
183	167	2014	0.73	0.71
229	180	2015	0.91	0.76
274	204	2016	1.01	0.82
267	224	2017	0.96	0.87
259	242	2018	0.91	0.90
252	256	2019		
245	259	2020		
238	252	2021		
230	245	2022		
223	238	2023		
216	230	2024		
208	223	2025		
201	216	2026		
194	208	2027		
187	201	2028		
179	194	2029		
172	187	2030		
165	179	2031		
157	172	2032		
150	165	2033		
143	157	2034		
135	150	2035		
128	143	2036		
121	135	2037		
114	128	2038		
106	121	2039		
99	114	2040		



Progress towards 2018 Fatality and Fatality Rate Targets

2018 Fatality and Fatality Rate Targets

DRCOG TMA Fatalities	DRCOG TMA Fatalities 5 Year Moving Average	Year	DRCOG TMA Fatality Rate	DRCOG TMA Fatality Rate 5 Year Moving Average
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179	194	2029		
172	187	2030		
165	179	2031		
157	172	2032		
150	165	2033		
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135	150	2035		
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64% REDUCTION TO HIT 2040 TARGET

Progress Towards 2018 Fatality and Fatality Rate Targets

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183	167	2014	0.73	0.71
229	180	2015	0.91	0.76
274	204	2016	1.01	0.82
264	223	2017	0.95	0.87



Recommended 2019 Fatality and Fatality Rate Target

"METRO VISION" SAFETY TARGET SETTING METHODOLOGY

Regional Objective 5: Operate, manage and maintain a safe and reliable transportation system.

Performance Measures

Measure	Where are we today? (Baseline)	Where do we want to be? (2040 Target)
Non- single occupant vehicle (Non-SOV) mode share to work	25.1 percent (2014)	35.0 percent
Daily vehicle miles traveled (VMT) per capita	25.5 daily VMT per capita (2010)	10.0 percent decrease from 2010
Average travel time variation (TTV) (peak vs. off-peak)	1.22 (2014)	Less than 1.30
Daily person delay per capita	6 minutes (2014)	Less than 10 minutes
Number of traffic fatalities	185 (2014)	Fewer than 100 annually

62% REDUCTION TO HIT 2040 TARGET

DRCOG TMA Fatalities	DRCOG TMA Fatalities 5 Year Moving Average	Year	DRCOG TMA Fatality Rate	DRCOG TMA Fatality Rate 5 Year Moving Average
229	180	2015	0.91	0.76
274	204	2016	1.01	0.82
264	223	2017	0.95	0.87
259	242	2018	0.91	0.90
252	256	2019	0.85	0.93
245	259	2020		
238	252	2021		
230	245	2022		
223	238	2023		
216	230	2024		
208	223	2025		
201	216	2026		
194	208	2027		
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143	157	2034		
135	150	2035		
128	143	2036		
121	135	2037		
114	128	2038		
106	121	2039		
99	114	2040		

Why 5 Year Moving Average is Increasing

Year	DRCOG TMA Fatalities	Year	DRCOG TMA Fatalities
2014	183	2015	229
2015	229	2016	274
2016	274	2017	264
2017	264	2018	259
2018	259	2019	252



SAFETY TARGETS (Five Year Averages)		2018 TARGETS 2014-2018 Five Year Averages	2019 TARGETS 2015-2019 Five Year Averages
1	DRCOG FATALITIES	242	256
2	DRCOG FATALITY RATE PER 100 MILLION VMT	0.90	0.93
3	DRCOG SERIOUS INJURIES	1,948	1,935
4	DRCOG SERIOUS INJURY RATE PER 100 MILLION VMT	7.20	6.97
5	NON-MOTORIZED FATALITIES AND SERIOUS INJURIES	346	344



DRCOG Vision Zero Action Plan

- RFP to be released this month
- Project kick-off early 2019
- Project Purpose
 - Reduce fatalities and serious injuries in the Denver Region
 - Support DRCOG's various safety performance measures and targets
 - Increase awareness of Vision Zero to influence safer behaviors on roadways
 - Provide policies, standards, and strategies to encourage safety in planning and design of the regional transportation system





QUESTIONS?

DENVER REGIONAL COUNCIL OF GOVERNMENTS

STATE OF COLORADO

BOARD OF DIRECTORS

RESOLUTION NO. _____, 2018

A RESOLUTION ADOPTING 2019 SAFETY TARGETS FOR THE DENVER REGIONAL COUNCIL OF GOVERNMENTS TRANSPORTATION MANAGEMENT AREA AS PART OF THE PERFORMANCE-BASED PLANNING REQUIREMENTS OF THE FIXING AMERICA'S SURFACE TRANSPORTATION (FAST) ACT

WHEREAS, the Denver Regional Council of Governments, as the Metropolitan Planning Organization, is responsible for the operation and maintenance of the continuing transportation planning process designed to prepare and adopt transportation plans and programs; and

WHEREAS, the transportation planning process within the Denver region is carried out by the Denver Regional Council of Governments through a cooperative agreement with the Regional Transportation District and the Colorado Department of Transportation; and

WHEREAS, 23 USC 150(c) establishes requirements for performance measures and targets for safety, infrastructure condition, system performance, freight, and air quality; and

WHEREAS, federal statutes require the Denver Regional Council of Governments to annually set targets for five required safety performance measures (number of fatalities, rate of fatalities, number of serious injuries, rate of serious injuries, and number of non-motorized fatalities and serious injuries); and

WHEREAS, the safety targets were prepared by the Denver Regional Council of Governments in cooperation with the Colorado Department of Transportation; and

WHEREAS, the Transportation Advisory Committee and the Regional Transportation Committee have recommended that the Board of Directors adopt the 2019 safety targets.

NOW, THEREFORE, BE IT RESOLVED that, pursuant to its *Articles of Association*, and the authority granted under sections 30-28-106 and 43-1-1101 through 1105 of the Colorado Revised Statutes, as the Metropolitan Planning Organization for the Denver Region, the Denver Regional Council of Governments hereby adopts the following 2019 safety targets:

A RESOLUTION ADOPTING 2019 SAFETY TARGETS FOR THE DENVER REGIONAL COUNCIL OF GOVERNMENTS TRANSPORTATION MANAGEMENT AREA AS PART OF THE PERFORMANCE-BASED PLANNING REQUIREMENTS OF THE FIXING AMERICA'S SURFACE TRANSPORTATION (FAST) ACT

Resolution No. _____, 2018

Page 2

Safety Measures	2019 Target
• Number of fatalities	256
• Rate of fatalities (<i>per million VMT</i>)	0.93
• Number of serious injuries	1,935
• Rate of serious injuries (<i>per million VMT</i>)	6.97
• Number of combined non-motorized fatalities and serious injuries	344

RESOLVED, PASSED AND ADOPTED this ____ day of _____, 2018
at Denver, Colorado.

Herb Atchison, Chair
Board of Directors
Denver Regional Council of Governments

ATTEST:

Douglas W. Rex, Executive Director

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
303 480-6701 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Informational Briefing	14

SUBJECT

Briefing on the *2017 Annual Report on Traffic Congestion in the Denver Region*.

PROPOSED ACTION/RECOMMENDATIONS

No action requested. This item is provided for information only.

ACTION BY OTHERS

N/A

SUMMARY

DRCOG maintains a federally-required congestion management process (CMP). One component of the process is the calculation of congestion measurements for roadways in the DRCOG region, and presentation within an annual report on traffic congestion. The annual reports have been prepared since 2006.

Staff will provide an overview of the *2017 Annual Report on Roadway Traffic Congestion in the Denver Region*, including topics such as vehicle miles traveled in the region, the impacts of economic growth on congestion, results and benefits of past mitigation projects, and the potential impacts of emerging vehicle, roadway, and mobility service technologies. The report will be made available at the meeting.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

N/A

ATTACHMENT

Staff presentation

Link: [2017 Annual Report on Traffic Congestion in the Denver Region](#)

ADDITIONAL INFORMATION

If you need additional information please contact Douglas W. Rex, Executive Director, at 303 480-6701 or drex@drcog.org; or Robert Spotts, Senior Transportation Planner, Transportation Planning and Operations, at 303 480-5626 or rspotts@drcog.org.



Topics

1. DRCOG Congestion Management Program and VMT growth
2. Traffic congestion on major roadways
3. Performance of recently completed projects
4. What will transportation be like in 2040

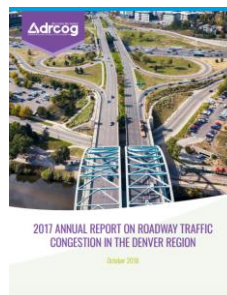
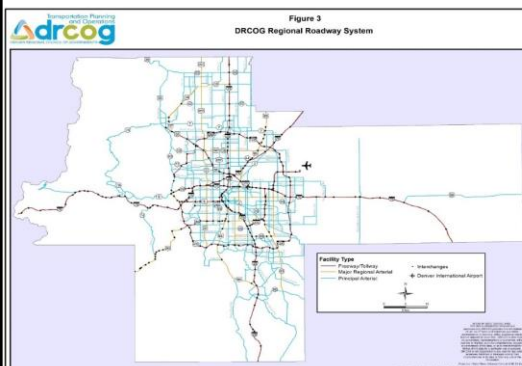
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DENVER REGIONAL COUNCIL OF GOVERNMENTS

1. CONGESTION MANAGEMENT PROGRAM AND VMT GROWTH



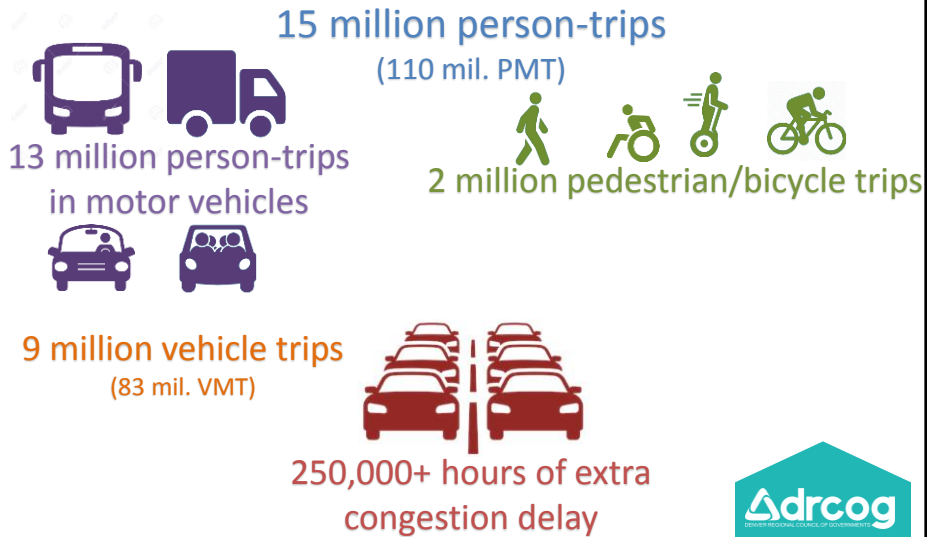
DRCOG Congestion Management Process

- MPOs are federally required to monitor congestion.
- DRCOG Annual Reports on Congestion since 2006
 - Report regional vehicle (VMT) and person (PMT) miles traveled
 - Roadway network info: physical traits, traffic volumes, transit routes
 - Used for TIP and RTP planning and project evaluation



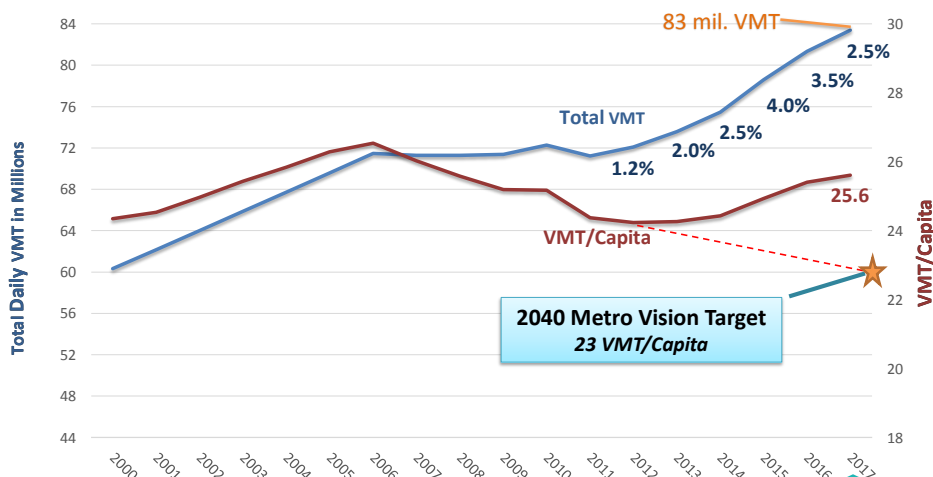


On an average weekday in the Denver region in 2017...



VTM Trends

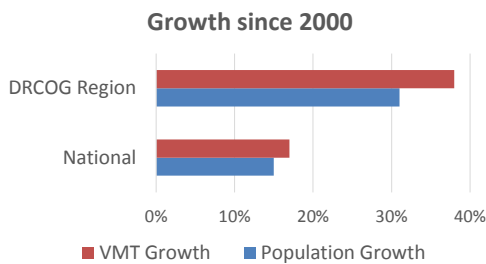
Average Daily VMT in the Denver Region (2000 – 2017)





Why is VMT Increasing?

- booming economy
- population and job growth
- housing prices/longer commutes
- more package deliveries
- construction activity



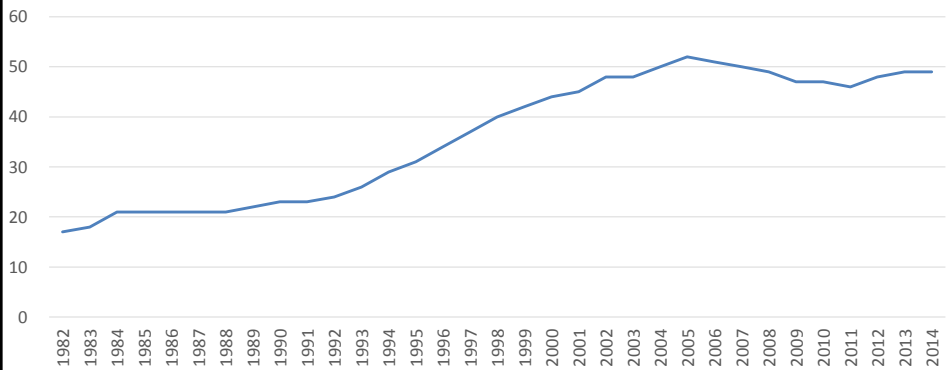
2. TRAFFIC CONGESTION ON MAJOR ROADWAYS



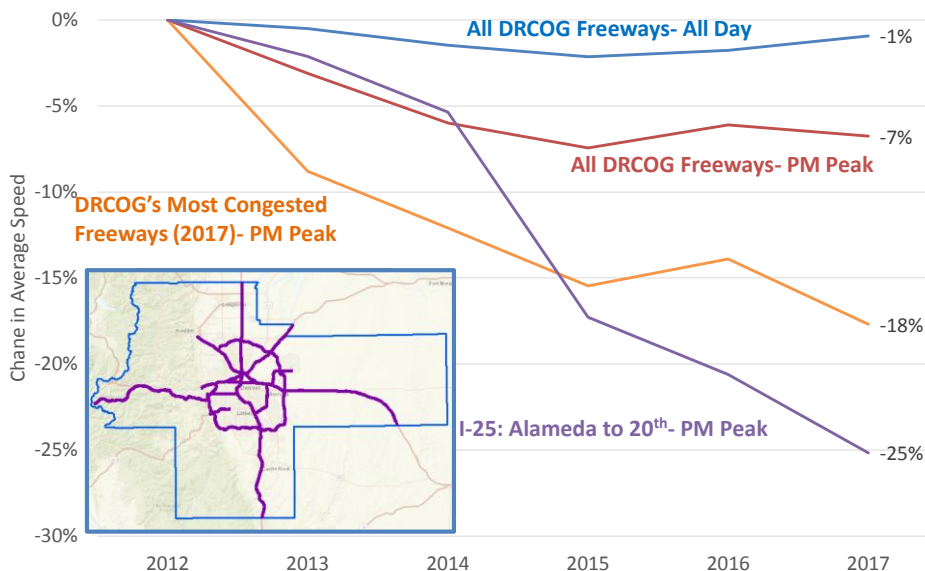
Congestion trends in the Denver region

- Regionwide vs. site specific
- Trends vary by location, time of day, time of year

Regionwide Annual Hours of Delay per Commuter (Texas Transportation Institute)

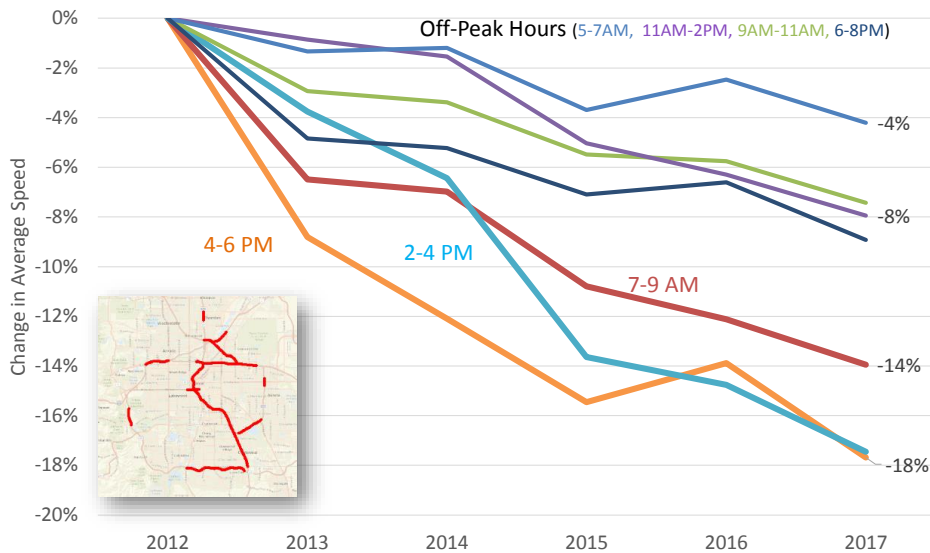


DRCOG annual average freeway speeds compared to 2012





What time of day is congestion getting worse- On DRCOG's Busiest Freeways

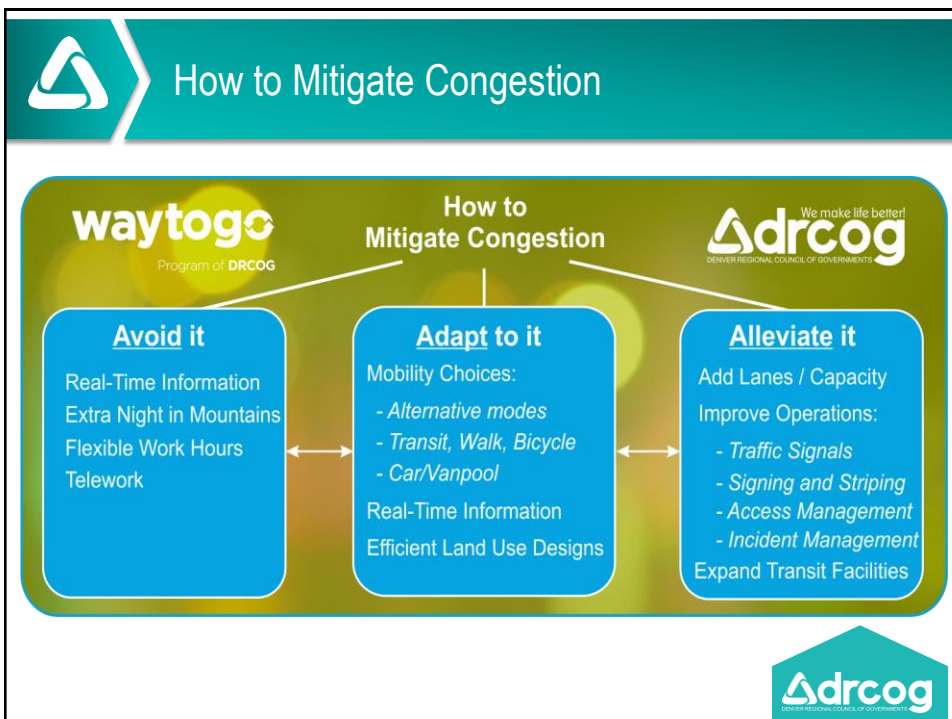
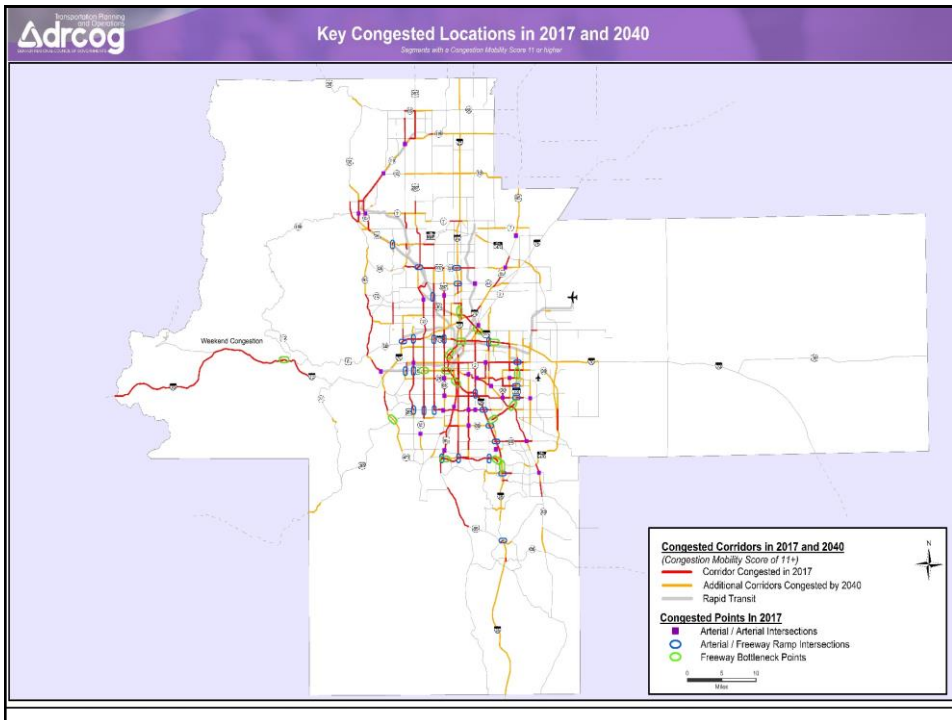


Congestion Mobility Score

Scores for road segments; four performance measures:

- **severity:**
How bad does congestion get on the roadway during rush hour?
- **duration:**
How many hours per day is the roadway congested?
- **magnitude:**
How many people (traffic volume) are impacted by congestion on the roadway?
- **reliability:**
How often do crashes or incidents occur on the roadway?





3. PERFORMANCE OF RECENTLY COMPLETED PROJECTS



Congestion Mitigation Toolkit Summary

1. Active roadway management

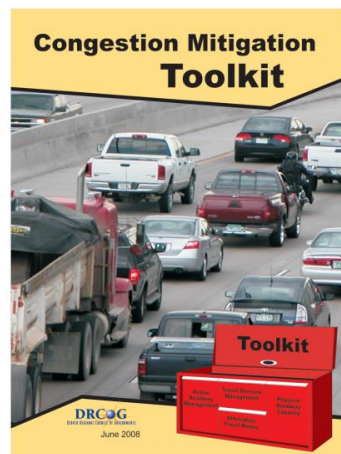
- A. Traffic signal timing/coordination/equipment
- B. Ramp meters
- C. Access management
- D. Incident management and response
- E. Traveler information mechanisms
- F. Electronic toll collection (ETC)
- G. Roadway signage
- H. Communication connections and surveillance

2. TDM/non-SOV travel options

- A. Transit service and facility expansion
- B. Transit queue-jump lanes and signal priority
- C. Parking and curbside management
- D. Telework and flexible work schedules
- E. Ridesharing services
- F. Off-street multi-use trails (pedestrian and bicycle)
- G. On-street bicycle treatments
- H. Efficient land use and development practices

3. Physical roadway capacity

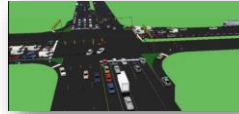
- A. Intersection turn lanes
- B. Acceleration/deceleration lanes
- C. Hill-climbing lanes
- D. Grade-separated railroad crossings
- E. Interchange redesigns
- F. Roundabout intersections
- G. Managed lanes (toll express, HOV, etc.)
- H. New travel lanes (widening), new roadways





DRCOG region Transportation Improvement Program projects completed: 2008-2017

- Active roadway management projects (\$50m+)
 - Signal timing
 - Intelligent transportation systems
 - Transportation operations
- Transportation demand management/non-SOV travel choice projects
 - Transit (\$3b+)
 - FasTracks support
 - Bus service expansion
 - Transportation demand management (~\$40m)
 - Way to go
 - Transportation management associations
 - Bicycle and pedestrian (~\$75m)
 - 40+ new facilities
 - 7 over/underpasses



wayto go
A program of DRCOG



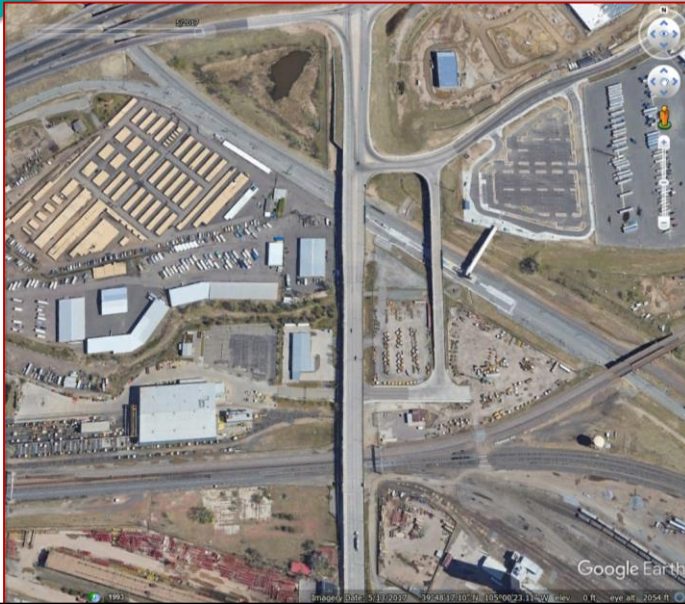
DRCOG region Transportation Improvement Program projects completed: 2008-2017

- Freeways/managed lanes (\$800m+) includes:
 - U.S. Route 36 toll express/bus rapid transit
 - North I-25 interim managed lanes, U.S. Route 36 to 120th Avenue
 - I-25, Ridgeway Parkway to County Line Road
 - I-225, Parker Road to Second Avenue
- Arterial streets (\$200m+) includes:
 - Colfax/17th avenues at I-225
 - Parker Road at Arapahoe Road interchange
 - Foothills Parkway (State Highway 157), Valmont Road to SH 119
- Railroad grade separations (\$120m+):
 - Pecos Street over railroad
 - Peoria Street over railroad/Smith Road
 - Wadsworth Boulevard under railroad/Grandview Ave

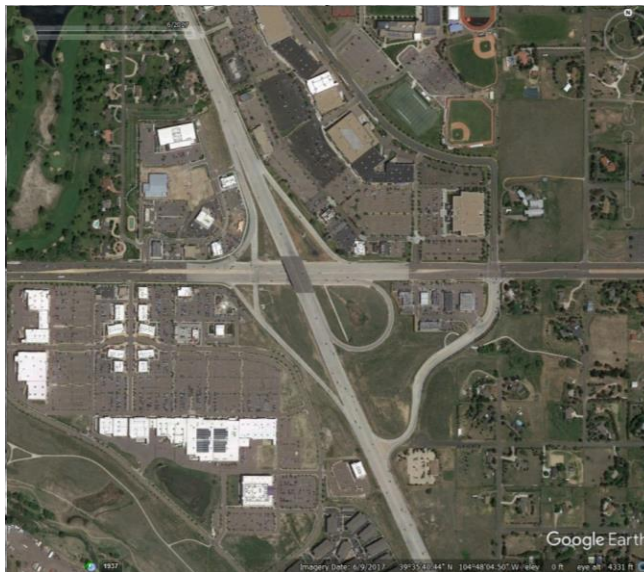




**Pecos St. before (2007); construction (2010);
completed project**



**Parker and Arapahoe- Long ago (1955); before
construction (2005); completed project**

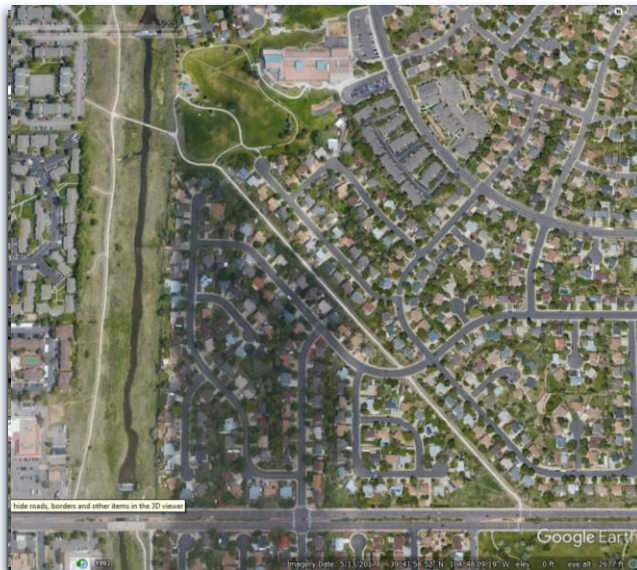




Broadway / Euclid underpass before (2005); completed project



Tollgate Creek multi-use trail: before (2011); completed project



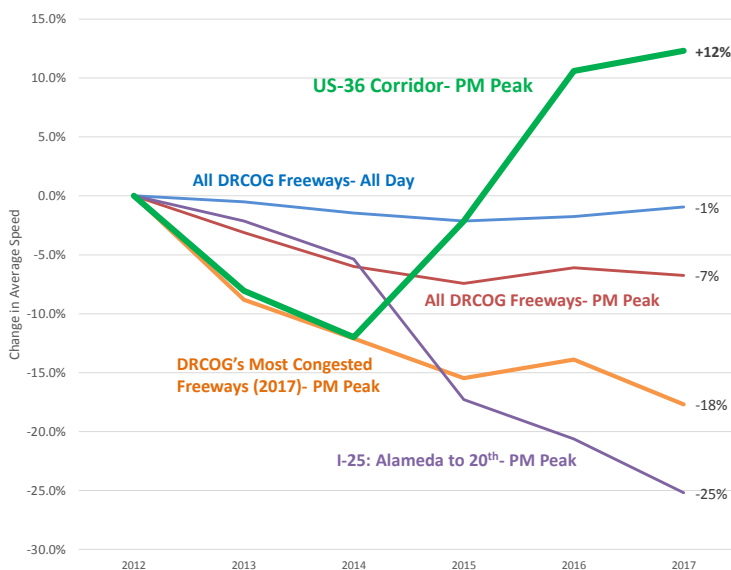


Regional benefits of the projects

- Used DRCOG's Focus Regional Travel Demand Model
- 18,500 person hours of delay per day reduced
- 6% less of travel mileage in severely congested conditions



Results of US-36 toll express/bus rapid transit project DRCOG annual average freeway speeds compared to 2012



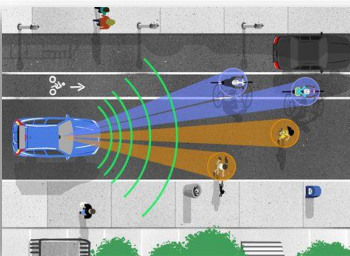
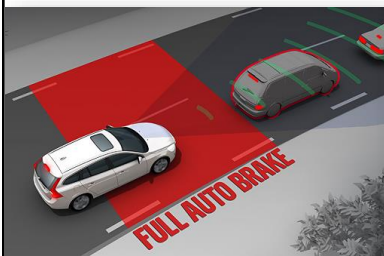
Special Congestion Topic

4. WHAT WILL TRANSPORTATION BE LIKE IN 2040



New technologies and innovation

- Advanced safety systems
- New travel modes and mobility services
- Travelers and shippers making better decisions using real-time information





Connected Vehicles (CVs)

“V2X”

- Vehicle to vehicle (V2V) communication
- Vehicle to infrastructure (V2I) communication
- Safety benefits – crash & incident reduction/avoidance
- Travel reliability benefits



Source: U.S. DOT



Automated Vehicles (AVs)

- Various levels of human driver operation: driver control with vehicle assistance (new cars today) --> full automation
- Various location settings: general purpose lanes to fixed guideways
- Various services: private vehicle, fleets, transit
- Collaboration of trucking industry, technology companies and government agencies (FHWA, NHTSA)





Considerations With Vehicle Technologies

- How will the capacity for carrying vehicles on the region's roadways change?
 - Increase? (closer vehicle spacing)
 - Decrease? (longer gaps for safety)
- Will VMT increase? (if increased roadway capacity entices more travel)
- Will alertness level of drivers decrease? (if overly dependent on new technology)
- How can multi-passenger HOV travel be increased? (such as shared rides and transit)
- How do we coordinate all of this?



QUESTIONS? COMMENTS?

ATTACH G

To: Chair and Members of the Board of Directors

From: Douglas W. Rex, Executive Director
(303) 480-6701 or drex@drcog.org

Meeting Date	Agenda Category	Agenda Item #
December 19, 2018	Informational	16

SUBJECT

December administrative modifications to the *2018-2021 Transportation Improvement Program*.

PROPOSED ACTION/RECOMMENDATIONS

No action requested. This item is for information.

ACTION BY OTHERS

N/A

SUMMARY

Per the DRCOG Board-adopted [Policy on Transportation Improvement Program \(TIP\) Preparation](#), administrative modifications to the [2018-2021 TIP](#) are reviewed and processed by staff. Administrative modifications represent revisions to TIP projects that do not require formal action by the DRCOG Board.

Once processed, the projects are posted on the [DRCOG 2018-2021 TIP web page](#) and emailed to the TIP Notification List, which includes members of the Regional Transportation Committee, the Transportation Advisory Committee, TIP project sponsors, staff of various federal and state agencies, and other interested parties.

The December 2018 administrative modifications are listed and described in the attachment. Highlighted items in the attachment depict project revisions.

PREVIOUS DISCUSSIONS/ACTIONS

N/A

PROPOSED MOTION

N/A

ATTACHMENT

1. 2018-2021 TIP Administrative Modifications (December 2018)

ADDITIONAL INFORMATION

If you need additional information, please contact Douglas W. Rex, Executive Director, at (303) 480-6701 or drex@drcog.org; or Todd Cottrell, Senior Transportation Planner, at (303) 480-6737 or tcottrell@drcog.org.

ATTACHMENT 1

To: TIP Notification List

From: Douglas W. Rex, Executive Director

Subject: **December 2018 Administrative Modifications to the 2018-2021
Transportation Improvement Program**

Date: December 19, 2018

SUMMARY

- Per the [Policy on Transportation Improvement Program \(TIP\) Preparation](#) covering the [2018-2021 TIP](#), administrative modifications are reviewed and processed by staff. They are emailed to the TIP Notification List, and posted on the [DRCOG 2018-2021 TIP web page](#).
- The TIP Notification List includes the members of the DRCOG Regional Transportation Committee and Transportation Advisory Committee, TIP project sponsors, staffs of various federal and state agencies, and other interested parties. The notification via email is sent when Administrative Modifications have been made to the 2018-2021 TIP. If you wish to be removed from the TIP Notification List, please contact Mark Northrop at (303) 480-6771 or via e-mail at mnorthrop@drcog.org.
- Administrative Modifications represent minor changes to TIP projects not defined as “regionally significant changes” for air quality conformity findings, or per CDOT definition.
- The projects included through this set of Administrative Modifications are listed below. The attached describes these modifications.

PROJECTS TO BE MODIFIED

- **1999-097: Regional Transportation Demand Management (TDM) Program Pool**
 - Remove pool project
- **2008-103: Region 1 FASTER Bridge Enterprise Pool**
 - Add funding and pool project
- **2012-121: Region 4 Non-Regionally Significant RPP Pool**
 - Add funding and pool project
- **2016-058: Ozone State Implementation Plan (SIP) Modeling Study**
 - Add funding

1999-097: Remove one pool project withdrawn by the sponsor. Funding is returned back to DRCOG for reprogramming

Existing

Title: **Regional Transportation Demand Management (TDM) Program Pool**

Project Type: **Congestion Management**

TIP-ID: **1999-097**

STIP-ID:

Open to Public:

Sponsor: **DRCOG**

Project Scope

The Regional TDM Program funds projects that promote alternatives to SOV travel, with the intent to reduce mobile source emissions.

This pool includes funds for seven TMA regional partnerships and other TDM projects selected through a call for projects.

Affected County(ies)

Regional



All pool project funding depicts federal and/or state funding only.

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
RTD	Bike-n-Ride Storage Facilities: Aurora and East Lines	\$300	Transportation Solutions	Networked Mobility Hubs Marketing Initiative (FY19)	\$245	Smart Commute Metro North	Adams County Regional Bike Share Promotion Program (FY19)	\$236
RTD	Bike-n-Ride Shelters: Broomfield/Sheridan Stations (FY16-17)	\$250	Lakewood	West Corridor TMA Start Up (FY19 w/ CMAQ)	\$252	Boulder Transportation Connections	Boulder Parking Cash Out Program (FY19)	\$197
Englewood	Oxford Ave First and Last Mile Connections (FY19)	\$87	Bike Denver	Neighborhood Navigator Program (FY19)	\$242	Bicycle Colorado	It's As Easy As ABC (FY19)	\$83

Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding
Federal (CMAQ)		\$1,573	\$252	\$0	\$0		
Federal (STP-M)		\$0	\$1,934	\$0	\$0		
State		\$0	\$0	\$0	\$0		
Local		\$393	\$454	\$0	\$0		
Total	\$4,318	\$1,966	\$2,640	\$0	\$0	\$0	\$8,924

Highlighted project to be removed

Revised

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
RTD	Bike-n-Ride Storage Facilities: Aurora and East Lines	\$300	Transportation Solutions	Networked Mobility Hubs Marketing Initiative (FY19)	\$245	Boulder Transportation Connections	Boulder Parking Cash Out Program (FY19)	\$197
RTD	Bike-n-Ride Shelters: Broomfield/Sheridan Stations (FY16-17)	\$250	Lakewood	West Corridor TMA Start Up (FY19 w/ CMAQ)	\$252	Bicycle Colorado	It's As Easy As ABC (FY19)	\$83
Englewood	Oxford Ave First and Last Mile Connections (FY19)	\$87	Bike Denver	Neighborhood Navigator Program (FY19)	\$242			

2008-103: Add one pool project and associated funding**Existing**Title: **Region 1 FASTER Bridge Enterprise Pool**Project Type: **Bridge**TIP-ID: **2008-103**STIP-ID: **SST8000**

Open to Public:

Sponsor: **CDOT Region 1****Project Scope**

Pool contains bridge-related improvements and repairs based on the new FASTER Bridge Enterprise funding program (Colorado Senate Bill 108) in CDOT Region 1.

Affected County(ies)

Adams
Arapahoe
Broomfield
Denver
Douglas
Jefferson



All pool project funding depicts federal and/or state funding only.

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
I-70	Over UPRR	\$11,934	I-70 Frontage Rd	Over Clear Creek	\$3,910	Central 70	(see TIP ID 2016-003)	
York St	Over I-270	\$17,380	County Rd	Over I-70	\$7,296			
I-70 WB	Over US 6, Clear Creek	\$30,000	US-36	Over Draw	\$3,379			

Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding
Federal		\$0	\$0	\$0	\$0		
State (FASTER-B)		\$17,000	\$53,899	\$0	\$0		
Local		\$0	\$0	\$0	\$0		
Total	\$3,000	\$17,000	\$53,899	\$0	\$0	\$0	\$73,899

Revised

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
I-70	Over UPRR	\$11,934	I-70 Frontage Rd	Over Clear Creek	\$3,910	Central 70	(see TIP ID 2016-003)	
York St	Over I-270	\$17,380	County Rd	Over I-70	\$7,296	I-70 Bridges	Design	\$4,000
I-70 WB	Over US 6, Clear Creek	\$30,000	US-36	Over Draw	\$3,379			

Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding
Federal		\$0	\$0	\$0	\$0		
State (FASTER-B)		\$17,000	\$57,399	\$0	\$0		
State (TCC)		\$0	\$500	\$0	\$0		
Local		\$0	\$0	\$0	\$0		
Total	\$3,000	\$17,000	\$57,899	\$0	\$0	\$0	\$77,899

2012-121: Add one pool project and associated funding**Existing**Title: **Region 4 Non-Regionally Significant RPP Pool**Project Type: **Roadway Operational Improvements**TIP-ID: **2012-121**

STIP-ID:

Open to Public:

Sponsor: **CDOT Region 4****Project Scope**

Pool contains projects selected under the Non-Regionally Significant Regional Priority Program in CDOT Region 4 (DRCOG-TIP area only).

Affected County(ies)

Boulder

Weld



All pool project funding depicts federal and/or state funding only.

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
SH-86: WCR 7 Intersection Imp		\$1,000	SH-7: Adaptive Signals - SH-287 to 28th St		\$1,474	SH-119: Bike/Ped Study	Boulder to Longmont	\$250
SH-86: Lyons to I-25 Access and PEL		\$2,187	Cherryvale Rd to N. 75th St		\$550	I-25 Mead Frontage Road Devolution	MP 234.86 to 234.162	\$75
Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding	
Federal		\$0	\$0	\$0	\$0			
State (R P P)		\$2,697	\$925	\$1,887	\$0			
Local		\$0	\$0	\$0	\$0			
Total	\$3,900	\$2,697	\$925	\$1,887	\$0	\$0	\$9,409	

Revised

Facility Name	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)	Facility Name (Cont)	Start-At and End-At	Cost (1,000s)
SH-86: WCR 7 Intersection Imp		\$1,000	Cherryvale Rd to N. 75th St		\$550	I-25 Future Parallel Road	WCR 9.5	\$100
SH-86: Lyons to I-25 Access and PEL		\$2,187	SH-119: Bike/Ped Study	Boulder to Longmont	\$250			
SH-7: Adaptive Signals - SH-287 to 28th St		\$1,474	I-25 Mead Frontage Road Devolution	MP 234.86 to 234.162	\$75			
Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding	
Federal		\$0	\$0	\$0	\$0			
State (R P P)		\$2,697	\$1,025	\$1,887	\$0			
Local		\$0	\$0	\$0	\$0			
Total	\$3,900	\$2,697	\$1,025	\$1,887	\$0	\$0	\$9,509	

2016-058: Move project from the 2016-2021 TIP and add \$125,000 in STP-Metro funding and associated match advanced from the future RAQC allocation in FY 2020. This amendment is contingent on approval of the specific item listed in the Board agenda

Existing (2016-2021 TIP)

Title: **Ozone State Implementation Plan (SIP) Modeling Study**

Project Type: **Air Quality Improvement Projects**

TIP-ID: **2016-058**

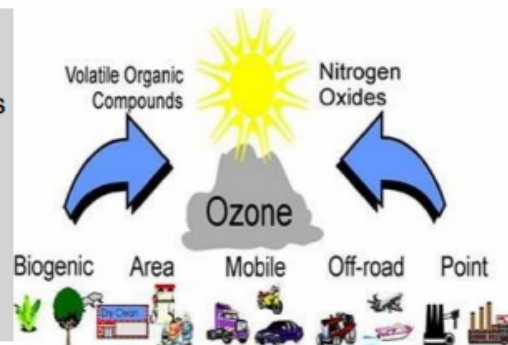
STIP-ID:

Open to Public: **2018**

Sponsor: **R A Q C**

Project Scope

Conduct modeling and strategy analysis to ensure that the region will be able to meet anticipated new standards by the mandated deadlines for tighter standards for ozone.



Affected County(ies)

Regional

Project Phases

Year Phase

2016 Initiate Study

Amounts in \$1,000s	Prior Funding	FY16	FY17	FY18	FY19	FY20-21	Future Funding	Total Funding
Federal (STP-M)		\$480	\$0	\$0	\$0	\$0		
State		\$0	\$0	\$0	\$0	\$0		
Local		\$120	\$0	\$0	\$0	\$0		
Total	\$0	\$600	\$0	\$0	\$0	\$0	\$0	\$600

Revised (2018-2021 TIP)

Amounts in \$1,000s	Prior Funding	FY18	FY19	FY20	FY21	Future Funding	Total Funding
Federal (STP-M)		\$0	\$125	\$0	\$0		
State		\$0	\$0	\$0	\$0		
Local		\$0	\$31	\$0	\$0		
Total	\$600	\$0	\$156	\$0	\$0	\$0	\$756

ATTACH H

Funds OK'd for three components of bus rapid transit between Boulder and Longmont

\$8.4M for bus bypass lanes on Diagonal at Colo. 52 to relieve rush hour traffic

DAILY CAMERA | Sam Lounsberry

November 30

A regional government group took an initial step toward bringing a bus rapid transit service between Boulder and Longmont this week through funding three projects officials hope will decongest the Diagonal Highway and facilitate faster travel through the cities' centers.

The Denver Regional Council of Governments — which includes members from dozens of Denver metro area municipal and county governments — awarded \$8.15 million toward installing a bus bypass lane on two miles of the Diagonal, and bringing bus lane improvements to 28th and Coffman streets in Boulder and Longmont, respectively.

Traffic volumes on the Diagonal are projected to increase 25 percent from current levels by 2040, according to the governments group.

"We don't think that continuing to just widen the general purpose lanes (of the Diagonal) is going to be a long-term solution. We need to provide mobility alternatives for people," Boulder County Alternative Transportation Coordinator Scott McCarey said. "The focus of those three components is to give travel time priority to high-occupancy vehicles and transit."

While each project is within officials' vision of a full bus rapid transit service between the cities — which the Regional Transportation District named its top priority in a study — such service along the entire Diagonal corridor may still be years away and could arrive separately from the improvements funded this week.

Funding to implement the highly desired bus service along the entire Diagonal simultaneously with these projects would have been available had the Proposition 110 ballot initiative passed in November's election, but its failure means officials will work to bring pieces of the service to the corridor as financing is secured, according to Ron Papsdorf, transportation planning director for the governments group.

"Buses will still be in mixed traffic in a lot of the corridor, but these three projects address a lot of the big bottlenecks in the corridor," Papsdorf said.

The bus bypass lane will be laid along the Diagonal for a mile on both sides of the Colo. 52 intersection, where the rush-hour congestion is the worst and often extends for a mile in either direction, officials said.

Buses would be able to exclusively use the lane and cruise past stopped traffic to just in front of the light to wait for its green signal.

Extensions of that lane may or may not be built with any additional future plans to implement bus rapid transit service along the rest of the corridor, an idea the RTD is studying through soliciting public feedback on multiple route and infrastructure options.

"The issue is that the (full bus rapid transit) project evaluation in the plan that RTD is in the midst of completing is not done yet. These three projects can go forward with or without the plan, and still be good for bus service regardless of any other things that happen," Longmont Transportation Planner Phil Greenwald said.

In Longmont along Coffman Street, officials plan to build center-running bus lanes between First and Ninth avenues for what they are calling the Coffman Street Busway.

Longmont officials have drafted a plan to implement 12-foot-wide bus-only lanes in either direction on Coffman without expanding the public right-of-way on the road. Regular vehicle travel lanes 11 feet wide would be on either side of the bus lanes, with 8-foot-wide parking lanes on each side of the street, and 5-foot-wide raised bike lanes on either side, plus 11-foot-wide sidewalks on either side.

The 28th Street improvements in Boulder consist of more than a half-mile of outside Business Access Transit lanes between Iris Avenue and Valmont Road that will be reserved for buses, as well as right-turning vehicles at approaches to intersections.

In road segments without driveways or intersections, the lanes will function as bus-only.

"Similar to the Coffman Street Busway, this is an operational improvement that will provide travel time and reliability benefits to regional and local transit vehicles by allowing them to bypass queuing in the general traffic lanes," officials wrote in their grant application to the governments group.

The total cost of all three projects is expected to be \$21 million, with \$6.9 million going toward the Coffman Street Busway, \$8.4 million going toward the Diagonal bus bypass lanes on either side of Colo. 52 and \$5.7 million going toward the 28th Street improvements, the application shows.

Colorado believes autonomous vehicles technology can save lives

Edge computing, take the wheel. The Colorado Department of Transportation is deploying roadside network devices to support connected and autonomous vehicles technology.

SEARCHNETWORKING | Alissa Irei

November 2018

When autonomous vehicles hit the blacktop, the Colorado Department of Transportation intends to be ready. In late 2017, CDOT recruited Bob Fifer -- a 25-year IT and network engineering veteran -- to help drive the transformation of the state's transportation system into a next-generation information system.

"What appealed to me was an opportunity to shape our future," said Fifer, who previously held network engineering, network operations and disaster recovery roles in the private sector.

"Colorado is trailblazing in this area, because we genuinely believe that technology can save lives."

The stakes are high. According to national estimates, more than nine in 10 car crashes in the United States happen because of human error. In Colorado, first responders see an average of two traffic-related deaths per day.

"We believe we can bring that number down to zero," Fifer said.

As a two-term city council member in the Denver suburb of Arvada and vice chair of the Denver Regional Council of City Governments, Fifer has long argued that technology can radically improve local and state infrastructure. At a conference, a CDOT official heard Fifer describing his vision for connected, intelligent roadways -- what he refers to broadly as highway automation -- and offered him a job.

"I negotiated my pay cut and jumped on over," Fifer said. He now serves as manager of infrastructure and business development in CDOT's transportation systems and technology branch, which he described as the department's "mini-telecommunications arm."

Fifer's team plans, builds, operates and maintains network infrastructure throughout the state, ranging from fiber optic cabling and network gear to intelligent transportation system devices -- such as analytical roadside cameras, smart traffic signals and highway message boards.

"The devices we're deploying on fiber now will all support connected, autonomous vehicles technology," he said.

Vehicle-to-infrastructure ecosystem supports connected cars

Although self-driving cars have yet to take American roadways by storm, Fifer pointed out that many new vehicles today boast a significant degree of automation, with features like adaptive cruise control, lane-departure correction, obstacle detection and collision avoidance. And a growing number of models -- from manufacturers like Tesla, Cadillac and Audi -- can already communicate with smart infrastructure and each other.

Denver was one of the first U.S. cities to test Audi's Traffic Light Information connected cars application, enabling traffic lights to share real-time signal phase and timing data with select models via the cars' built-in 4G LTE connectivity.

"On your dashboard, you can see how long that light is going to stay green, or if it's red, when it will turn green," Fifer said.

A vehicle-to-infrastructure (V2I) ecosystem that supports today's connected cars will serve as a foundation for tomorrow's autonomous vehicles technology and artificial intelligence, he added.

"We want to have technology on the road that will eventually detect if a car is running a red light and make all the other cars stop to prevent a T-bone accident from happening," Fifer said.

Drivers of eligible Audi models must subscribe to the manufacturer's Connect Prime service to see time-to-green information at connected intersections. On the infrastructure side, however, the technology is vendor-agnostic -- any V2I-enabled vehicle with a 4G LTE connection could theoretically communicate with the smart traffic lights, regardless of make or model. CDOT also plans to deploy V2I infrastructure that communicates via dedicated short-range communication protocol, the main alternative to 4G LTE.

Fifer predicted that, by 2022, the vast majority of new cars will possess V2I and vehicle-to-vehicle capabilities, while drivers of older models can add them by affixing puck-like IoT devices to their dashboards. CDOT's infrastructure will ultimately need to support as many as 4 million connected cars at any given time, Fifer said, adding up to a massive amount of data.

"A typical vehicle coming off the assembly line today has seven separate local area networks bundled up in its walls," he said. "These vehicles are going to give us millions and millions of messages per second."

Colorado has tapped Panasonic in a \$72 million contract to build a V2I ecosystem, helping state officials to collect and filter data so CDOT can use it to make highway infrastructure safer and more efficient. The state has now begun deploying 100 intelligent, roadside sensors along a 90-mile stretch of Interstate 70, between Denver and Vail.

"We're one of the first states to even think about, 'How do we take data, create intelligence and then create a reaction?'"

For example, Fifer said, if ice or snow triggers a vehicle's tire-traction alert, the network devices could forward its GPS location to CDOT, which would then send a snowplow to treat the road.

In another possible use case, if a connected car's airbags deployed in an accident, the vehicle could automatically forward its location to first responders -- critical moments before those on the scene could reach 911.

"Every minute we can shave off is a life we can save," Fifer said.