1. **Call to Order**

2. **Public Comment**
The chair requests that there be no public comment on issues for which a prior public hearing has been held before the Board of Directors.

3. **Summary of February 5, 2020 Board Work Session**
   (Attachment A)

4. **Discussion of Urban arterial multimodal safety improvements set-aside**
   (Attachment B) Ron Papsdorf

5. **Draft 2050 Metro Vision Regional Transportation Plan (2050 MVRTP) scenario outcome results**
   (Attachment C) Jacob Riger

6. **Adjourn**
BOARD WORK SESSION SUMMARY
February 5, 2020

Directors present:
John Diak, Vice Chair Parker
Eva Henry Adams County
Jeff Baker Arapahoe County
Elise Jones Boulder County
William Lindstedt City and County of Broomfield
Nicole Frank Commerce City
Nicholas Williams City and County of Denver
Kevin Flynn City and County of Denver
Roger Partridge Douglas County
Bob Fifer Arvada
Aaron Brockett Boulder
Deborah Mulvey Castle Pines
Tammy Maurer Centennial
Randy Weil Cherry Hills Village
Paul Haseman Golden
Pamela Grove Littleton
Wynne Shaw Lone Tree
Ashley Stolzmann Louisville
Herb Atchison Westminster
Bud Starker Wheat Ridge
Bill Van Meter Regional Transportation District

Participating via Webex:
Lynnette Kelsey Georgetown
Stephanie Walton Lafayette

Others present: Doug Rex, Executive Director; Chris Chovan, Adams County; Mac Callison, Aurora; Brad Bolad, Castle Rock; Lauren Pulver, Douglas County; Deborah Fahey, Louisville; Kent Moorman, Thornton; Jon Whiting, Thornton; Danny Herrman, CDOT R1; and DRCOG staff.

Board Vice Chair John Diak facilitated the work session. The session began at 4:03 p.m.

Public Comment
No public comment was received.

Briefing on HB 20-1151: Expansion of Authority for Regional Transportation Improvements
Ron Papsdorf, Transportation Planning and Operations Director, explained the bill to the Board. House Bill 20-1151 was introduced on January 17, 2020. The bill concerns the expansion of authority for regional transportation improvements. By amending the existing Regional Transportation Authority statute, this bill would enable transportation planning organizations (TPOs), defined as metropolitan planning organizations or rural
transportation planning organizations, to create and exercise the powers of a regional transportation authority.

Executive Director Rex noted that staff wanted input from the directors, including pros and cons, questions or concerns, or opportunities that might exist to improve the language that could be submitted to the drafters. He wanted to make sure that we have a combined message to send to Metro Mayors Caucus.

After a robust discussion amongst the directors, one main concern was that there was no clear language stating that a jurisdiction has an opt-out option and they would like that noted and taken back to the drafters.

Proposed 2050 Metro Vision Regional Transportation Plan (2050 MVRTP) scenario outcome measures
Jacob Riger, Long Range Transportation Planning Manager, presented the scenario outcome measures to the committee. DRCOG staff introduced the scenario analysis process for the 2050 MVRTP and sought input on concepts to test. Staff has also been soliciting input from RTC, TAC, the subregional forums and the public through the 2050 MVRTP public engagement process. Based on all feedback received, staff proposed several scenarios to test that include multimodal transportation and land use concepts. Additional proposed outcome assessment measures/topics staff suggests including are:
• planning-level scenario cost estimates
• growth and development trends
• safety-related measures
• human service transportation use
• other topics as desired

The work session ended at 5:25 p.m.
SUBJECT
Eligibility rules and evaluation process for the selection of projects to be funded through the Urban Arterial Multimodal Safety Improvements Program.

PROPOSED ACTION/RECOMMENDATIONS
N/A

ACTION BY OTHERS
March 23, 2020 – TAC Recommended Approval, with an amendment

SUMMARY
CDOT Region 1 has previously allocated $25 million of State Flexible (SB17-267) funds for Urban Arterial Safety Improvements and $26 million of State Transit (SB17-267) funds for Denver Area Arterial Street Pre-BRT and BRT Elements.

At its February 24, 2020 meeting, the DRCOG Transportation Advisory Committee recommended the creation of a $26 million Urban Arterial Multimodal Safety Improvements Program using $9 million of unanticipated DRCOG-directed Surface Transportation Block Grant (STBG) funds and $17 million of CDOT-directed STBG funds.

This recommendation is pending approval by the DRCOG Regional Transportation Committee (RTC), DRCOG Board of Directors and the Colorado Transportation Commission.

CDOT and DRCOG have determined that it is desirable to allocate these three funding allocations (totaling approximately $77 million) through one consolidated call for projects.

In order to meet the required project delivery and spending requirements of the SB17-267 funds, DRCOG and CDOT are requesting review and approval of eligibility rules and project selection process for this combined call for projects in April. The Transportation Advisory Committee reviewed the proposed Eligibility Rules and Selection Process document at its March 23, 2020 meeting and unanimously recommended approval with an amendment to remove "road diets" from the list of project and project component examples. This recommendation, along with the previous TAC recommendation to create the Urban Arterial Multimodal Safety Improvements Program will be presented for action at the April RTC and Board meetings.

PREVIOUS DISCUSSIONS/ACTIONS
Board of Directors – February 19, 2020

PROPOSED MOTION
N/A
ATTACHMENTS

- Staff presentation
- *Eligibility Rules and Selection Process* document as amended by TAC

ADDITIONAL INFORMATION

If you need additional information, please contact Douglas W. Rex, Executive Director, at 303-480-6701 or drex@drcog.org; or Ron Papsdorf, Division Director, Transportation Planning and Operations, at 303-480-6747 or rpapsdorf@drcog.org.
Urban Arterial Multimodal Safety Improvements Program

Eligibility Rules and Selection Process
Program Purpose

Joint effort of CDOT and DRCOG to support infrastructure projects that improve safety, especially for vulnerable users, along urban arterials within the DRCOG Metropolitan Planning Organization and consistent with CDOT’s and DRCOG’s Vision Zero efforts.
Program Goals

- Reduce fatal and serious injury crashes on the region’s transportation system
- Support a transportation system that safely accommodates all modes of travel
- Improve transit access and multimodal mobility
- Support the development of connected urban/employment centers and multimodal corridors
- Provide safe access to opportunity and mobility for residents of all ages, incomes and abilities, including vulnerable users
Available Funding and Eligibilities

• Three funding categories
  • State Transit (SB17-267): $26 million (available only for projects located within CDOT Region 1)
  • State Flexible (SB17-267): $25 million (available only for projects located within CDOT Region 1)
  • STBG: $26 million (available for projects located within the DRCOG MPO boundary)

• SB17-267 funds are limited to projects located on arterial State Highways that otherwise meet program criteria
• STBG funds are available for projects on the federal-aid-eligible roadways, especially those that are on the high injury network, that otherwise meet the program criteria
Funding Requirements

• All eligible and funded projects must be able to complete all activities and submit all billings by **no later than June 1, 2024**
• Applicants may specify a preference for state-only funds for projects on state highways, but CDOT and DRCOG cannot guarantee a specific funding source for a particular project
• Minimum grant request: $250,000
• Maximum grant request: $15,000,000
• Minimum local match: 20%
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Category</th>
<th>Summary</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Extent to which the project addresses an identified safety need, especially those located on a High Injury Network</td>
<td>35</td>
</tr>
<tr>
<td>Enhanced Mobility (vulnerable users) and Transit</td>
<td>Extent to which the project improves safe multimodal mobility for vulnerable users or improves safe transit access and/or reliability</td>
<td>25</td>
</tr>
<tr>
<td>Other considerations: Innovation, Technology, Devolution, Benefit-Cost, etc.</td>
<td>Extent to which the project involves innovation, technology, state highway devolution, and is cost-effective</td>
<td>10</td>
</tr>
<tr>
<td>Public Support/Local Match</td>
<td>Extent to which the applicant demonstrates public support and committed local match</td>
<td>10</td>
</tr>
<tr>
<td>Readiness</td>
<td>Extent to which the applicant demonstrates the ability to meet project delivery requirements</td>
<td>20</td>
</tr>
</tbody>
</table>
Application and Selection Process

Project Call Released: Monday, April 20, 2020
Applications Due to CDOT R1: Wednesday, June 3, 2020 by 5pm MT

CDOT/DRCOG/RTD Staff Panel
Scoring/Selection Panel
1 CDOT R1 Traffic
1 CDOT DTR
1 CDOT R1 Dep Dir
1 DRCOG
1 RTD

Advisory Committee
2 CDOT staff and 1 staff person from each of 8 DRCOG subregions review scoring and formulate recommendation

Scoring/Selection Panel reconvenes to review Advisory Committee recommendations

Scoring/Selection Panel makes final recommendation

All STBG Projects selected by panel are reviewed by agency exec mgmt, then go through agency processes for comment before final TC approval

Mgmt and Board/Commission Process and TC approval

June 8 - 12
June 15
June 16 - 19
June 16 - 19

DRCOG TAC – June 22
DRCOG RTC – July 14
DRCOG Board – July 15
CDOT TC – July 15/16
Questions?
Urban Arterial Multimodal Safety Improvements Program
FY 2021 - FY 2023 Projects
Eligibility Rules and Selection Process

Program Purpose
The Urban Arterials Multimodal Safety Improvements Program (UAMSI) program was developed by the Colorado Department of Transportation (CDOT) and the Denver Regional Council of Governments (DRCOG) to support infrastructure projects that improve safety, especially for vulnerable users, along urban arterials within the DRCOG Metropolitan Planning Organization (MPO) and consistent with CDOT’s and DRCOG’s regional Vision Zero efforts.

Program Goals
- Reduce fatal and serious injury crashes on the region’s transportation system
- Support a transportation system that safely accommodates all modes of travel
- Improve transit access and multimodal mobility
- Support the development of connected urban/employment centers and multimodal corridors
- Provide safe access to opportunity and mobility for residents of all ages, incomes and abilities, including vulnerable users

Applicant Eligibility Requirements
- Applicants must be eligible to be direct recipients of federal transportation funds. These include local governments, CDOT, RTD, and other governmental agencies. Nonprofits and transportation management associations/organizations (TMA/Os) are not eligible applicants for projects but may partner with a governmental agency. Private, for-profit companies (e.g., contractors, suppliers, or consultants) are not eligible.
- Applicants must pledge local matching funds.

Project Eligibility Requirements

Funding background
There are three main funding categories for this program: State Transit (SB17-267), State Flexible (SB17-267), and Federal Surface Transportation Block Grant (STBG). The amounts available from each category are:
- State Transit: $26,000,000 (available only for projects located within CDOT Region 1)
- State Flexible: $25,000,000 (available only for projects located within CDOT Region 1)
- STBG: $26,000,000 (available for projects located within the DRCOG MPO boundary)

Eligible Project Locations
The location of projects is limited to the following:
- State funds from SB17-267 are limited to projects located on arterial State Highways that otherwise meet the program criteria.
- Federal STBG funds are available for projects on the federal-aid-eligible roadways, especially those that are on the high injury network (HIN), that otherwise meet the program criteria.
  - Bicycle and Pedestrian project locations are exempt from the above
Eligible project types
Applicants must consider the program goals in developing project concepts.

Project components and scopes must adhere to Surface Transportation Block Grant program guidance (https://www.fhwa.dot.gov/specialfunding/stp/) and should address the specific safety problems at the project location. This funding is for capital projects (infrastructure) only. A non-exhaustive list of example project types is included below.

project and project component examples
- Bicycle and pedestrian facilities, including sidewalks, crossings, pedestrian amenities, and protected bicycle facilities.
- Pedestrian safety enhancements such as pedestrian-actuated crossings, Rectangular Rapid Flashing Beacon, intersection crosswalk improvements, curb extensions, obstruction elimination, etc.
- Traffic calming, road diets, complete street improvements, speed reduction measures.
- Projects with innovative concepts or those that utilize technology to address overall program goals
- Pedestrian-scale lighting and other street lighting enhancements
- Improved access to transit stops
- Raised medians
- Signal improvements
- Transit amenities: access enhancements such as bus queue jump lanes and bus pads
- This is a non-exhaustive list.

Ineligible projects
Roadway through lane capacity projects greater than 1 mile are not eligible under the Urban Arterial Multimodal Safety Program. Please reach out to CDOT or DRCOG staff if there are questions about eligibility.

Funding Requirements
Because of the rules in the various funding programs, all eligible and funded projects must be able to complete all activities and submit all billings by no later than June 1, 2024. Applicants may specify a preference for state-only funds for projects on state highways, but CDOT and DRCOG cannot guarantee a particular funding source allocation for a particular project.

Each project must request a minimum of $250,000 and is not allowed to request more than $15,000,000 from the program, excluding match.

A local match of at least 20% of the total project cost is required (total federal and/or state share equals 80%). Additional overmatch is allowable as part of the application (though not tracked within the IGA with CDOT) and given additional consideration within the scoring criteria.
Application Process

1. Identify the project concepts to discuss at the pre-application workshop
2. Attend a UAMSI program pre-application and funding reimbursement workshop hosted at CDOT
3. Complete and submit an application
   Applications should be submitted along with letters of support from impacted or participating entities. Per CDOT requirements, the application requires a mandatory Risk Assessment form to be submitted along with the application. Projects requiring CDOT concurrence (projects on a state highway or within the state rights-of-way) must provide an official CDOT response with the application submission. Projects requiring RTD concurrence (projects involving RTD service, facilities, RTD maintenance, within RTD rights-of-way, or otherwise in need of RTD involvement) must provide an official RTD response with the application submittal.

Project Funding Evaluation and Selection Process

CDOT and DRCOG will establish an internal scoring and selection panel to assist with scoring and evaluating projects. Participants may include staff from various CDOT and DRCOG divisions:

- CDOT Region 1 Traffic
- CDOT Division of Transit and Rail
- CDOT Region 1 Engineering Design Representative
- DRCOG Representative
- RTD Representative

Each member of the panel will review the applications and assign points to the criteria based on information contained in the project application forms. The panel will convene to discuss the applications and reach consensus on the final criteria points and total score for each project.

Project review, scoring and recommendation

Applications will be reviewed and scored based on the program evaluation criteria. A CDOT/DRCOG final scoring and selection panel will prepare and provide project evaluation information to an advisory panel that includes a staff representative selected by each DRCOG subregional transportation forum and two CDOT representatives. The advisory panel will prepare a recommendation to the scoring and selection panel for final review and recommendation to DRCOG’s Transportation Advisory Committee and Regional Transportation Committee for a recommendation prior to presentation to the DRCOG Board of Directors and Colorado Transportation Commission for approval.

Applicants are notified about approved projects
## Evaluation criteria

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</tr>
</tbody>
</table>

### Award Conditions

- All project scopes of work are subject to review and approval by DRCOG, RTD (as appropriate), and CDOT. The submitted and approved project scope becomes the work that the applicant at a minimum must complete.

- Each applicant awarded funds will sign an IGA and enter into a contract with the Colorado Department of Transportation (CDOT) to implement the project depending on the type, location and other characteristics of the project. CDOT is the ultimate steward of these state and federal funds. CDOT will specify requirements for status reporting and reimbursement requests.

- Select applicants may be required to attend a post-project debrief with DRCOG and CDOT staff.

- Projects must be completed and all billings submitted by June 1, 2024. No reimbursements will be provided for work completed or billings submitted after June 1, 2024.

- Applicants will work with DRCOG, CDOT, RTD (as appropriate), and FHWA/FTA to ensure that the project is being implemented in accordance with federal requirements.
To: Chair and Members of the Board Work Session

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

Meeting Date       Agenda Category       Agenda Item #
April 1, 2020      Discussion              5

SUBJECT
Draft 2050 Metro Vision Regional Transportation Plan (2050 MVRTP) scenario outcome results.

PROPOSED ACTION/RECOMMENDATIONS
N/A

ACTION BY OTHERS
N/A

SUMMARY
At the February Board Work Session, the Board informally endorsed several measures and topics to assess the outcomes of the land use and transportation scenarios as part of developing the 2050 MVRTP. As a reminder, this assessment is not intended as a rigorous “evaluation” of the scenarios, to “choose” a specific scenario (or hybrid), or to label a particular scenario “good” or “bad” based on its characteristics or results. The objective is to understand how and to what extent each scenario influences regional relationships between urban form, transportation system approaches, and travel and mobility patterns. The scenarios are compared to each other and to a baseline in relative terms using a variety of quantitative and qualitative outcome measures.

Since DRCOG Board endorsement of the scenarios in December, DRCOG staff have been coding, modeling, and compiling the results of the scenarios. As a reminder, staff tested five transportation scenarios and two land use scenarios, both separately and in several combinations. The testing started with an initial draft of the base 2050 land use forecast, created specifically for scenario testing, and the 2050 base transportation network. This network is defined as the 2050 Fiscally Constrained Regional Transportation Plan and is run with the 2050 base land use. This 2050 transportation/land use base was used as the foundation for every transportation scenario (network coding) and to compare its model results with each transportation scenario.

Additionally, two land use scenarios (“infill” and “centers”), were tested against several of the transportation scenarios and compared with the transportation scenario results using the 2050 transportation/land use base.

As shown in the attached table and presentation, there is a substantial amount of scenario outcome results. The presentation also defines and illustrates each of the transportation and land use scenarios. DRCOG staff will walk the Board through the scenario outcome results at the April meeting with the goal of helping Board members understand and make sense of the plethora of results. Based on the discussion at the March TAC meeting and April Board Work Session, staff anticipates further discussing the implications of scenario results at the April TAC meeting in order to define a framework for developing the 2050 MVRTP.
PREVIOUS DISCUSSIONS/ACTIONS
Board of Directors – November 20, 2019  
December 18, 2019

PROPOSED MOTION
N/A

ATTACHMENTS
• Scenario results table
• Staff presentation

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, Manager, Long Range Transportation Planning, at 303-480-6751 or jriger@drcog.org
### Scenario Model Measures (Weekday)

<table>
<thead>
<tr>
<th>Total Travel</th>
<th>2020 Base</th>
<th>2050 Base</th>
<th>Off-Peak Congestion</th>
<th>Regional Managed Lanes &amp; Operations</th>
<th>Travel Choices</th>
<th>Transit</th>
<th>Infill Land Use</th>
<th>Travel Choices with Infill Land Use</th>
<th>Centers Land Use</th>
<th>Transit + Centers Land Use</th>
<th>Connected/ Autonomous Vehicles (Efficiencies)</th>
<th>Connected/ Autonomous Vehicles (Inefficiencies)</th>
<th>Metro Vision Target</th>
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<tbody>
<tr>
<td>Person Miles Traveled (PMT) Grand Total</td>
<td>120,518,000</td>
<td>177,463,000</td>
<td>178,724,000</td>
<td>181,782,000</td>
<td>168,120,000</td>
<td>178,017,000</td>
<td>170,577,000</td>
<td>161,559,000</td>
<td>171,124,000</td>
<td>160,083,000</td>
<td>169,584,000</td>
<td>185,504,000</td>
<td></td>
</tr>
<tr>
<td>PMT in Autos &amp; Trucks</td>
<td>118,648,000</td>
<td>171,757,000</td>
<td>173,063,000</td>
<td>176,265,000</td>
<td>161,922,000</td>
<td>168,365,000</td>
<td>161,493,000</td>
<td>151,903,000</td>
<td>154,557,000</td>
<td>129,908,000</td>
<td>165,507,000</td>
<td>179,604,000</td>
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<tr>
<td>PMT on Transit, Walk, Bike</td>
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<td>3,746,000</td>
<td>3,712,000</td>
<td>3,584,000</td>
<td>4,178,000</td>
<td>6,135,000</td>
<td>6,615,000</td>
<td>7,031,000</td>
<td>13,056,000</td>
<td>26,980,000</td>
<td>2,968,000</td>
<td>3,926,000</td>
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<td>PMT on Transit</td>
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<td>2,765,000</td>
<td>2,733,000</td>
<td>2,615,000</td>
<td>2,752,000</td>
<td>5,209,000</td>
<td>5,343,000</td>
<td>5,270,000</td>
<td>11,268,000</td>
<td>24,700,000</td>
<td>1,578,000</td>
<td>2,935,000</td>
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</tr>
<tr>
<td>PMT on Transit, Walk, bike / Total PMT</td>
<td>2.1%</td>
<td>2.1%</td>
<td>2.3%</td>
<td>2.0%</td>
<td>2.5%</td>
<td>3.4%</td>
<td>3.3%</td>
<td>4.4%</td>
<td>7.6%</td>
<td>16.9%</td>
<td>1.4%</td>
<td>21%</td>
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<tr>
<td>Total Person Trips</td>
<td>15,143,000</td>
<td>21,040,000</td>
<td>21,047,000</td>
<td>21,058,000</td>
<td>20,726,000</td>
<td>20,727,000</td>
<td>21,375,000</td>
<td>21,062,000</td>
<td>22,136,000</td>
<td>22,189,000</td>
<td>21,104,000</td>
<td>21,038,000</td>
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<tr>
<td>Vehicle Trips</td>
<td>10,269,000</td>
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<td>14,308,000</td>
<td>14,321,000</td>
<td>14,977,000</td>
<td>14,998,000</td>
<td>15,774,000</td>
<td>12,909,000</td>
<td>12,913,000</td>
<td>11,611,000</td>
<td>12,588,000</td>
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<tr>
<td>Trips by Transit, Walk, and Bike</td>
<td>1,292,000</td>
<td>1,894,000</td>
<td>1,889,000</td>
<td>1,873,000</td>
<td>2,605,000</td>
<td>2,124,000</td>
<td>2,827,000</td>
<td>3,585,000</td>
<td>4,616,000</td>
<td>6,044,000</td>
<td>1,513,000</td>
<td>1,918,000</td>
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</tr>
<tr>
<td>% of Households Making Transit Trips</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
<td>14%</td>
<td>15%</td>
<td>15%</td>
<td>26%</td>
<td>38%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Share of Work Trips Non-SOV</td>
<td>19%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>24%</td>
<td>22%</td>
<td>30%</td>
<td>35%</td>
<td>46%</td>
<td>55%</td>
<td>17%</td>
<td>21%</td>
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<tr>
<td>Vehicle Miles Traveled (VMT)</td>
<td>87,080,000</td>
<td>126,283,000</td>
<td>127,074,000</td>
<td>125,606,000</td>
<td>119,060,000</td>
<td>124,165,000</td>
<td>118,740,000</td>
<td>111,693,000</td>
<td>116,187,000</td>
<td>95,521,000</td>
<td>115,538,000</td>
<td>132,062,000</td>
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<tr>
<td>VMT/PMT</td>
<td>72%</td>
<td>71%</td>
<td>71%</td>
<td>71%</td>
<td>71%</td>
<td>70%</td>
<td>70%</td>
<td>69%</td>
<td>68%</td>
<td>68%</td>
<td>68%</td>
<td>71%</td>
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</tr>
<tr>
<td>VMT per Capita</td>
<td>26.8</td>
<td>26.7</td>
<td>26.8</td>
<td>27.4</td>
<td>27.1</td>
<td>26.2</td>
<td>25.1</td>
<td>24.5</td>
<td>20.2</td>
<td>24.4</td>
<td>27.3</td>
<td>22</td>
<td></td>
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<tr>
<td>Vehicle Hours Traveled (VHT)</td>
<td>2,486,000</td>
<td>3,851,000</td>
<td>3,835,000</td>
<td>3,651,000</td>
<td>3,751,000</td>
<td>3,748,000</td>
<td>3,577,000</td>
<td>3,472,000</td>
<td>3,306,000</td>
<td>2,591,000</td>
<td>3,264,000</td>
<td>4,585,000</td>
<td></td>
</tr>
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### Delay

<table>
<thead>
<tr>
<th>Delay</th>
<th>2020 Base</th>
<th>2050 Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Hours of Delay</td>
<td>474,000</td>
<td>939,000</td>
</tr>
<tr>
<td>Person hours of delay in vehicle</td>
<td>649,000</td>
<td>1,277,000</td>
</tr>
<tr>
<td>Average Person Delay Per Trip (mins)</td>
<td>3.0</td>
<td>4.1</td>
</tr>
<tr>
<td>% of Total VMT in Severe Congestion</td>
<td>16.4%</td>
<td>24.3%</td>
</tr>
<tr>
<td>Severely Congested Lane Miles</td>
<td>1,275</td>
<td>2,600</td>
</tr>
</tbody>
</table>

### Demographics

<table>
<thead>
<tr>
<th>Demographics</th>
<th>2020 Base</th>
<th>2050 Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teleworkers on Typical Day</td>
<td>322,000</td>
<td>318,000</td>
</tr>
<tr>
<td>Households in Urban Centers</td>
<td>241,000</td>
<td>340,000</td>
</tr>
<tr>
<td>Jobs in Urban Centers</td>
<td>871,000</td>
<td>1,081,000</td>
</tr>
<tr>
<td>Roadway Transportation GHGs</td>
<td>41,000,000</td>
<td>39,000,000</td>
</tr>
<tr>
<td>GHGs Per Capita</td>
<td>24.6</td>
<td>17.0</td>
</tr>
</tbody>
</table>

*Note: <35* indicates values below 35%.
2050 Metro Vision
Regional Transportation Plan
Draft 2050 Scenario Outcome Results
Project Schedule

SUMMER/FALL 2019
Phase 1: visioning and education

WINTER 2019/SPRING 2020
Phase 2: investment priorities and scenario options

FALL/WINTER 2020
Phase 3: plan development

SPRING 2021
Phase 4: draft plan review
Scenario Planning Process

Define Vision & Desired Outcomes
- Phase I Engagement
  - What’s important to us about our transportation system?

Prepare Tools
- 2050 Land Use Forecasts
- Land Use Model
- Updated Travel Model
  - Tools to model and test regional scenarios

Define & Test Scenarios
- Transportation
- Urban Form
  - Explore regional relationships between urban form, transportation investments, and mobility outcomes

Prepare 2050 MVRTP
- Major Projects
- Investment Strategy
  - How do scenario analysis outcomes inform project & investment decisions in the 2050 MVRTP?
Understanding Relationships

Urban Form
- Land use (residential, commercial, industrial, etc.)
  - Building design
  - Block design
  - Housing density
  - Job locations
  + many more

Transportation System
- Highways
- Local roads
- Bike lanes
- Bus routes
- Rail lines
- Mobility options
  + many more

Travel & Mobility Patterns
DRCOG’s Approach

Explores “what if” alternative futures

Relative comparisons between scenarios and baseline

Not rigorous evaluation of scenarios, nor choosing/judging scenarios

Choices & tradeoffs from individual scenarios

Provide guidance and direction for plan development
Scenario Analysis

Land Use Scenarios

- Infill
- Centers

Transportation Scenarios

- 2050 Base (2040 FCRTP)
- Off-Peak Congestion
- Managed Lanes & Operations
- Travel Choices
- Transit
- Automated/Connected Vehicles

Alvan
A Growing Region

DRCOG Region Demographic Data

- **Population**
- **Employment**

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>3,362,000</td>
<td>2,168,000</td>
</tr>
<tr>
<td>2030</td>
<td>3,802,000</td>
<td>2,451,000</td>
</tr>
<tr>
<td>2040</td>
<td>4,170,000</td>
<td>2,714,000</td>
</tr>
<tr>
<td>2050</td>
<td>4,387,000</td>
<td>2,979,000</td>
</tr>
</tbody>
</table>
A Growing Region

Vehicle Miles Traveled (VMT) in Millions

<table>
<thead>
<tr>
<th>Years</th>
<th>2020</th>
<th>2050 Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions</td>
<td>87.1</td>
<td>126.3</td>
</tr>
</tbody>
</table>

Transit, Walk, and Bicycle Trips in Millions

<table>
<thead>
<tr>
<th>Years</th>
<th>2020</th>
<th>2050 Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions</td>
<td>1.3</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Vehicle Hours of Delay (VHD) in Thousands

<table>
<thead>
<tr>
<th>Years</th>
<th>2020</th>
<th>2050 Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thousands</td>
<td>474</td>
<td>938</td>
</tr>
</tbody>
</table>
2040 Fiscally Constrained Networks
2050 Base

Roadway Capacity Projects

Rapid Transit System

Legend:
- **Rapid Transit Station with Parking**
- **Rapid Transit Station without Parking**
- **Other Stations/Transit Centers**
- **Pedestrian/Commuter Rapid Transit Route**
- **Bus Rapid Transit or Streetcar**
- **Regional Roadway System**

[Map diagrams showing various transportation infrastructure projects and systems.]
Scenario Combinations Summary

2050 Base

2050 Base Transportation
Off-Peak Congestion
Managed Lanes & Operations
Travel Choices
Transit

Infill

Travel Choices

Centers

2050 Base Transportation
Transit
Pause for Questions

• Questions so far?
Scenario Combinations

2050 Base Land Use

+ 

2050 Base Transportation
Off-Peak Congestion
Managed Lanes & Operations
Travel Choices
Transit
Off-Peak Congestion Scenario

Build out the freeway/interstate system to address off-peak congestion.

**Widen I-270 and I-25** (between E-470/NW Pkwy. and C-470/E-470)

**Major interchange reconstructions** at four bottleneck locations:
- I-225 / I-70
- I-225 / I-25
- US-6 / I-25
- US-285 / C-470
Off-Peak Congestion Outcomes

Compared to the 2050 Base

Less than 1% change in vehicle miles traveled and transit trips

(Regional person delay decreases by 3%)

<table>
<thead>
<tr>
<th></th>
<th>AM Peak I-25 from C-470 (Lone Tree) to SH-7 (Broomfield)</th>
<th>Daily Volume I-25 @ Speer</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 Base</td>
<td>70 minutes</td>
<td>260,000</td>
</tr>
<tr>
<td>2050 Base</td>
<td>88 minutes</td>
<td>330,000</td>
</tr>
<tr>
<td>Off-Peak Congestion Scenario</td>
<td>79 minutes</td>
<td>380,000</td>
</tr>
</tbody>
</table>

Some traffic is diverted from arterial streets onto I-70 and I-25.

While there are few changes at the regional level, some specific corridors have significant impacts.
Off-Peak Congestion Change from 2020

- Vehicle Miles Traveled: 45% (2050 Base), 46% (Off-Peak Congestion)
- Transit, Walk, and Bicycle trips: 47% (2050 Base), 46% (Off-Peak Congestion)
- Vehicle Hours of Delay: 98% (2050 Base), 93% (Off-Peak Congestion)
Managed Lanes & Operations Scenarios

- **Build 325 additional lane miles** of freeway managed lanes (HPTE Express Lanes Master Plan)
- Improve operations and incident management strategies

Improve operations & traffic flow on region’s highways/freeways.
Managed Lanes & Operations

Outcomes

Compared to the 2050 Base

People in vehicles experience **25% less delay** on average

**3% increase** in vehicle miles traveled
(~800,000 more daily VMT compared to the 2050 Base)

**Travel reliability increases significantly on the region’s freeways.**

**Fewer secondary crashes and improved safety due to enhanced incident management.**
Managed Lanes & Operations Change from 2020

- Vehicle Miles Traveled: 45% (2050 Base), 49% (Managed Lanes & Operations)
- Transit, Walk, and Bicycle Trips: 47% (2050 Base), 45% (Managed Lanes & Operations)
- Vehicle Hours of Delay: 98% (2050 Base), 51% (Managed Lanes & Operations)
Travel Choices Scenario

Increase travel & mobility choices along region’s major arterials.

Active transportation is encouraged through **better infrastructure** and **lower speeds** on high activity urban arterials.

Telecommuting & other Transportation Demand Management (TDM) strategies.
Travel Choices Outcomes

Compared to the 2050 Base

More than **twice** as many teleworkers

400,000 fewer drive alone work trips every day

50% increase in bicycle/pedestrian trips

*(Slight decrease in transit trips)*

Due to safer roadway design there are fewer crashes, injuries, and fatalities.

Even with reduced speed limits, there is less total delay.
Travel Choices Change from 2020

Percent Change from 2020

<table>
<thead>
<tr>
<th>Category</th>
<th>2050 Base</th>
<th>Travel Choices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Miles Traveled</td>
<td>45%</td>
<td>37%</td>
</tr>
<tr>
<td>Transit, Walk, and Bicycle Trips</td>
<td>47%</td>
<td>101%</td>
</tr>
<tr>
<td>Vehicle Hours of Delay</td>
<td>98%</td>
<td>73%</td>
</tr>
</tbody>
</table>
Transit Scenario

Improve/expand the region's transit network and service.

- Completion of FasTracks and additional miles of rail
- Extensive Bus Rapid Transit (BRT) network and expanded transit service on all routes \((8x \text{ as many service hours})\)
- Free fares and improved station/stop access
Transit Outcomes

Compared to the 2050 Base

79% of households have good transit access to jobs
(Compared to 58% in the 2050 Base)

76% more transit trips
(Small decrease in walk and bike trips)

100,000 more households use transit
(14% of all households)

Free transit provides personal, mobility, and equity benefits.
There is a 2% decrease in vehicle miles traveled.
Transit Change from 2020

- Vehicle Miles Traveled: 45% (2050 Base), 43% (Transit)
- Transit, Walk, and Bicycle Trips: 47% (2050 Base), 64% (Transit)
- Vehicle Hours of Delay: 98% (2050 Base), 87% (Transit)
METRO VISION TARGETS
Transportation Scenarios
Metro Vision Targets

Reduce Daily Vehicle Miles Traveled (VMT) per Capita

- 2020: 25.9
- 2050 Base/Off-Peak Congestion: 26.7
- Travel Choices: 25.1
- Managed Lanes & Operations: 27.4
- Transit: 26.2

MV Target: 23
Transportation Scenarios
Metro Vision Targets

Reduce Single-Occupyant Vehicle (SOV) Mode Share to Work

<table>
<thead>
<tr>
<th>Year</th>
<th>SOV Mode Share to Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>81%</td>
</tr>
<tr>
<td>2050 Base/Off-Peak</td>
<td>80%</td>
</tr>
<tr>
<td>Congestion</td>
<td>76%</td>
</tr>
<tr>
<td>Travel Choices</td>
<td>80%</td>
</tr>
<tr>
<td>Managed Lanes &amp;</td>
<td>78%</td>
</tr>
<tr>
<td>Operations</td>
<td></td>
</tr>
<tr>
<td>Transit</td>
<td></td>
</tr>
</tbody>
</table>

MV Target: 65%
Minimize Increase of Daily Person Delay per Capita

<table>
<thead>
<tr>
<th>Year/Category</th>
<th>PHD per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>7.0</td>
</tr>
<tr>
<td>2050 Base/Off-Peak Congestion</td>
<td>9.9</td>
</tr>
<tr>
<td>Travel Choices</td>
<td>8.6</td>
</tr>
<tr>
<td>Managed Lanes &amp; Operations</td>
<td>7.5</td>
</tr>
<tr>
<td>Transit</td>
<td>9.3</td>
</tr>
</tbody>
</table>

MV Target: Less than 9 Minutes
Pause for Questions

• Questions so far?
LAND USE SCENARIOS
Land Use Scenarios
Households & Employment

- Regional Household Growth to 2050
- Regional Job Growth to 2050
- Anchored to Local Zoning and Permitted Plats
- Location Choice Models’ Calibration
Land Use Scenarios
Households & Employment

Sourced from our shared vision

Baseline

Infill
Centers
### Infill

What if local governments allow for more urban and suburban redevelopment and infill?

- **Urban + Inner suburban**: 11% of region’s land area*

### Centers

What if local governments focus opportunity for development around key centers and corridors?

- **Rapid transit stations + Urban centers + Employment centers**: 3% of region’s land area

---

* 2010 Census Urban Area was 15% of region’s land area
Where Location Choices Fall

Modest intensification over a large area vs. significant change in a small area

Infill
- Base year share of households: 67%
- 2050 share of households: 70%
- 75% of household growth

Centers
- Base year share of households: 19%
- 2050 share of households: 37%
- 63% of household growth
### Beyond Visualization to Metrics

#### Outcome Metric

<table>
<thead>
<tr>
<th>Density</th>
<th>Baseline</th>
<th>Infill</th>
<th>Centers</th>
<th>MV Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional population-weighted density</td>
<td>6,152 people per mi.²</td>
<td>7,620 people per mi.²</td>
<td>9,816 people per mi.²</td>
<td>6,063 people per mi.²</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Urban Centers</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of total households in urban centers</td>
<td>11%</td>
<td>15%</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Share of total jobs in urban centers</td>
<td>31%</td>
<td>35%</td>
<td>41%</td>
<td>50%</td>
</tr>
</tbody>
</table>

#### Jobs/Housing

<table>
<thead>
<tr>
<th>Outcome Metric</th>
<th>Baseline</th>
<th>Infill</th>
<th>Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median distance of household growth to a top 10 employment center</td>
<td>5.8 mi.</td>
<td>2.6 mi.</td>
<td>1.8 mi.</td>
</tr>
</tbody>
</table>

#### Area Stability

<table>
<thead>
<tr>
<th>Outcome Metric</th>
<th>Baseline</th>
<th>Infill</th>
<th>Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of single-family areas remaining in that range of development intensity</td>
<td>81%</td>
<td>82%</td>
<td>88%</td>
</tr>
</tbody>
</table>

#### Intensity of Change

<table>
<thead>
<tr>
<th>Outcome Metric</th>
<th>Baseline</th>
<th>Infill</th>
<th>Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of households in highest range of development intensity</td>
<td>15%</td>
<td>18%</td>
<td>24%</td>
</tr>
</tbody>
</table>
Pause for Questions

• Questions so far?
Scenario Combinations

Infill + Centers
Baseline 2050 + Travel Choices
Baseline 2050 + Transit
Jacob
Infill Scenario

What if local governments allow for more urban and suburban redevelopment and infill?
Infill Outcomes

Compared to the 2050 Base

6% decrease in vehicle miles traveled

People in vehicles experience 11% less delay on average

Almost twice as many transit trips (and a 50% increase in walk and bike trips)

A range of housing options across the region benefits individuals and families and can improve the economic vitality and diversity of local communities.

Commercial vehicle trips decrease with consolidation of stops.
Infill Change from 2020

- **Vehicle Miles Traveled**: 45% (Base), 36% (Infill)
- **Transit, Walk, and Bicycle Trips**: 47% (Base), 119% (Infill)
- **Vehicle Hours of Delay**: 98% (Base), 78% (Infill)
Infill + Travel Choices Scenario

Increase travel & mobility choices along region’s major arterials.

- Allow for more housing/jobs in **existing urban and inner suburban areas**
- Active transportation is encouraged through **better infrastructure and lower speeds** on high activity urban arterials
- Telecommuting & other Transportation Demand management (TDM) strategies
Vehicle miles traveled decreases by **14.5 million** each day
(~11% less VMT compared to the 2050 Base)

**Twice** as many walking and biking trips
(~16% of all trips taken in the region)

A range of housing options across the region benefits individuals and families and can improve the economic vitality and diversity of local communities.

More transit trips than in the “Transit” Scenario.
Infill + Travel Choices
Change from 2020

- **Vehicle Miles Traveled**: 45% (2050 Base) vs. 28% (Infill + Travel Choices)
- **Transit, Walk, and Bicycle Trips**: 47% (2050 Base) vs. 178% (Infill + Travel Choices)
- **Vehicle Hours of Delay**: 98% (2050 Base) vs. 53% (Infill + Travel Choices)
Scenario Comparisons
Change from 2020

Vehicle Miles Traveled
- 2050 Base: 45%
- Infill: 37%
- Travel Choices: 36%
- Infill + Travel Choices: 28%

Transit, Walk, and Bicycle Trips
- 2050 Base: 0%
- Infill: 47%
- Travel Choices: 101%
- Infill + Travel Choices: 119%
- 2020: 178%
Pause for Questions

• Questions so far?
What if local governments focus opportunity for development around **key centers and corridors**?
8% decrease in vehicle miles traveled

Over 3 times as many transit trips

Over twice as many walk and bicycle trips

Connected urban centers across the region accommodate a growing share of the region’s housing and employment and support existing neighborhoods.

Average Person Delay per Trip decreases by 27%. Some localized areas experience more congestion.
Centers Change from 2020

- **Vehicle Miles Traveled**: 45% (2050 Base), 33% (Centers)
- **Transit, Walk, and Bicycle Trips**: 47% (2050 Base), 257% (Centers)
- **Vehicle Hours of Delay**: 98% (2050 Base), 51% (Centers)
Centers + Transit Scenario

Improve/expand the region's transit network and service.

Focus housing/jobs around key centers and corridors

Cost of driving and parking increases significantly

Completion of FasTracks and additional miles of rail

Extensive BRT network and expanded service

Free fares & improved station/stop access
Centers + Transit Outcomes

Vehicle miles traveled decrease 24%

3 times as many walk and bicycle trips

6 times as many transit trips

(2.4 million transit trips daily)

Connected urban centers across the region accommodate a growing share of the region’s housing and employment and support existing neighborhoods.

More total person trips since there is more free-time for short trips.

People in vehicles experience 50% less delay on average.
Scenario Comparisons
Change from 2020

Vehicle Miles Traveled

- 2050 Base: 45%
- Centers: 43%
- Centers + Transit: 31%
- Centers + Transit + Costs: 26%

Transit, Walk, and Bicycle Trips

- Transit: 47%
- Centers: 64%
- Centers + Transit: 257%
- Centers + Transit + Costs: 313%

Percent Change from 2020
Reduce Daily Vehicle Miles Traveled (VMT) per Capita

<table>
<thead>
<tr>
<th>Year</th>
<th>Daily VMT per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>25.9</td>
</tr>
<tr>
<td>2050 Base</td>
<td>26.7</td>
</tr>
<tr>
<td>Infill</td>
<td>25.1</td>
</tr>
<tr>
<td>Centers</td>
<td>24.0</td>
</tr>
<tr>
<td>Infill + Travel Choices</td>
<td>23.6</td>
</tr>
<tr>
<td>Centers + Transit</td>
<td>20.2</td>
</tr>
</tbody>
</table>

MV Target: 23
Reduce Single-Occupant Vehicle (SOV) Mode Share to Work

SOV Mode Share to Work

- 2020: 81%
- 2050 Base: 80%
- Infill: 70%
- Centers: 54%
- Infill + Travel Choices: 65%
- Centers + Transit: 45%

MV Target: 65%
Minimize Increase of Daily Person Delay per Capita

<table>
<thead>
<tr>
<th>Year</th>
<th>Daily Person Delay per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>7.00</td>
</tr>
<tr>
<td>2050 Base</td>
<td>9.86</td>
</tr>
<tr>
<td>Infill LU</td>
<td>8.85</td>
</tr>
<tr>
<td>Centers LU</td>
<td>7.50</td>
</tr>
<tr>
<td>Travel Choices + Infill LU</td>
<td>7.60</td>
</tr>
<tr>
<td>Transit + Centers LU</td>
<td>4.22</td>
</tr>
</tbody>
</table>

MV Target: Less than 9 Minutes
Pause for Questions

• Questions so far?
ELECTRIC & AUTOMATED VEHICLES
Reduce Daily Transportation GHG per Capita by Electric Vehicle Share of All Vehicles

- **2040 MV Target: 10**

**Daily Pounds of GHG per Capita**

- **2020**: 24.6
- **2050 Base**: 16.4
- **Infill**: 15.3
- **Centers**: 14.7
- **Infill + Travel Choices**: 14.4
- **Centers + Transit**: 12.3

- **Current Estimate**: 25% EVs
- **25% EVs**: 11.5
- **75% EVs**: 11.0
- **20% EVs**: 10.8
- **10% EVs**: 9.2

**EV Adoption Rates**

**Metro Vision Targets**
Automated/Connected Vehicles

- Connected/ Autonomous Vehicles (Inefficiencies)
- 2020 Base to 2050 Base
- Connected/ Autonomous Vehicles (Efficiencies)

VMT per Capita

Percent of VMT in Severe Congestion

- 2020
- 2050
Next Steps

• Board Work Session today & April RTC: Absorb plethora of scenario results

• April TAC: Implications of scenario results for 2050 MVRTP
  • How should scenario results shape project identification & evaluation?
  • How should scenario results shape financial plan investment strategies?

• Spring/Summer: Prepare draft 2050 MVRTP
  • Solicit/identify candidate projects for fiscal constraint
  • Prepare 2050 financial plan (revenues & expenditures)