









January 2019



Today's Presentation

- Emerging Mobility Systems
- Imagining the Year 2030
- Objectives
- Tactical Actions
- Mile High Travelers
- Mobility Gridlock vs. Mobility Bold
- Moving Forward
- Action Initiators

Public Consumption

Transformative technologies are changing the ways people "consume" transportation





A program of DRCOG



Uber













Emerging Mobility Systems

- √ Shared mobility
- √ Vehicle technology
- ✓ Transportation systems optimization
- ✓ Travel information and payment
- ✓ Freight and delivery









Imagining the Year 2030

Together, we are deciding how new technologies will transform the way we travel.

What does the Blueprint seek to accomplish?



Collaboration of CDOT, RTD, and DRCOG policies, programs, and transportation investments



Pilot projects with private sector partners and continued participation of the business community



Identifying potential for efficient technology-leveraged investments

Why is this approach unique?



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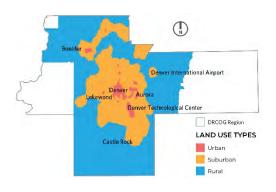
Collaborative



Regional







Collaborative



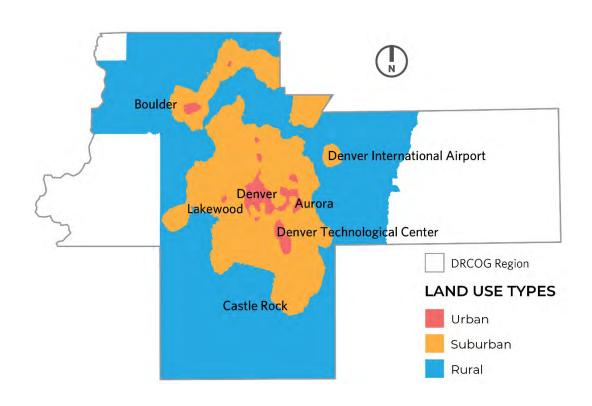
Building on the collaborative momentum of the Blueprint's effort going forward, these partners will initiate Tactical Actions and engage the private sector, county and municipal agencies, along with interested organizations and community groups to integrate the actions into our region.

Integrated



Regional

The Denver region encompasses more than 3 million people living in urban, suburban, and rural areas stretched over 9 counties and more than 5,000 square miles.



Community Engagement

- ✓ Inclusive citizen interviews
- ✓ Metro ambassadors
- ✓ Digital outreach
- ✓ Educational events
- ✓ Public workshops

2,000+ REACHED



What did we learn from your community?



Importance of mobility – it's a key enabler of quality of life



It's about more than infrastructure



Missing links create gaps to connectivity



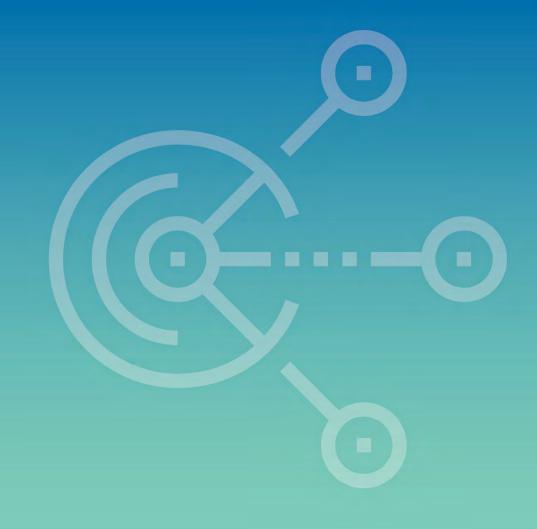
Safety and security are critical

Our Vision

Our metropolitan region employs a full array of flexible technology and services to maximize safety and access to mobility choices connecting people of all ages, incomes, and abilities to jobs, recreation, healthcare, amenities, and other daily activities, enhancing and protecting our quality of life now and in the future.



Objectives





Regional Collaboration

Close institutional gaps, update legal and regulatory frameworks, and coordinate with private sector technology implementers



System Optimization

Connect transportation systems and vehicles with smart technologies to improve safety and operations



Shared Mobility

Integrate new options of vehicle sharing and ride sharing into the existing multimodal transportation system network



Data Security & Sharing

Analyze travel data from public and private mobility providers to improve transportation system performance while maintaining security and protecting privacy



Mobility Electrification

Encourage use of electric powertrains in automobiles and transit vehicles



Driverless Vehicle Preparation

Prepare for autonomous vehicles to provide safe operations and reduced congestion while retaining a sound human experience



New Transportation Funding

Establish new funding sources to replace traditional sources that are losing effectiveness

Tactical Actions



Establish a mobility technology advisory committee

THEME

Funding & Finance
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD , Denver Metro Chamber

ADDITIONAL PARTICIPANTS

New mobility entity



Establish a new publicprivate partnership mobility entity or entities to pursue mobility technology implementation

THEME

Human Experience
Funding & Finance
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD, Denver Metro Chamber

ADDITIONAL PARTICIPANTS

N/A



Implement transit priority on all major bus corridors

THEME

Human Experience
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR RTD

ADDITIONAL PARTICIPANTS

Cities, counties, CDOT



Implement smart traffic signal control technology on all major regional arterial corridors

THEME

Safety Efficiency & Sustainability

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

Cities, counties, CDOT



Implement "smart corridor" operations on all regional freeways

THEME

Safety
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

Cities, counties, DRCOG



Develop a universal mobility app for trip planning and payment

THEME

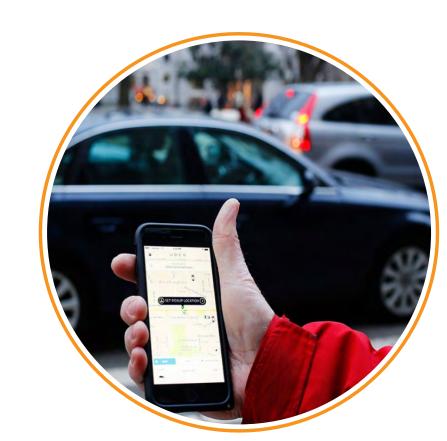
Human Experience

TACTIC INITIATOR

RTD

ADDITIONAL PARTICIPANTS

New mobility entity, E-470 Public Highway Authority, Northwest Parkway Public Highway Authority



Adopt a regional compact defining common standards for micromobility services

THEME

Safety Infrastructure Governance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

Cities, counties



Implement curbside management standards

THEME

Safety Human Experience Efficiency & Sustainability

TACTIC INITIATOR

DRCOG, RTD

ADDITIONAL PARTICIPANTS

Cities, counties, new mobility entity



Establish a regional mobility data platform

THEME

Human Experience
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD, Denver Metro Chamber

ADDITIONAL PARTICIPANTS

Cities, counties, National Renewable Energy Laboratory, universities, new mobility entity, Colorado Office of Information Technology



Establish an aggressive, agreed-upon goal to transition government fleets to zero-emission vehicles

THEME

Efficiency & Sustainability

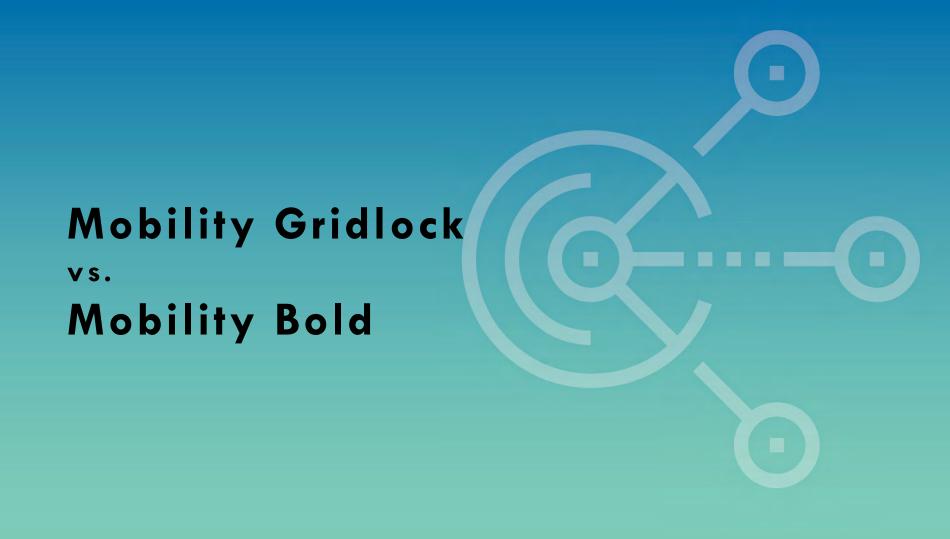
TACTIC INITIATOR

CDOT, DRCOG, RTD

ADDITIONAL PARTICIPANTS

Cities, counties, Colorado Energy Office, Regional Air Quality Council





WHICH WILL BE OUR **MOBILITY CHOICE?**



- Gridlock & Disarray
- **Limited Access**
- **Economic Barriers**
- Congestion





- **Economic Opportunity Happier Commute**
- **Options & Choice** Accessibility for All



ECONOMY



Losing Ground

Increased traffic congestion and uncoordinated adoption of new technologies could

cost \$50 million

in unrealized benefits across the region each year by 2030.





Opportunities for All

Less time spent traveling, more efficient freight movement, improved safety and new accessibility contribute to an annual benefit to the region in excess of

\$1.9 billion gained







50% increase in crashes (compared with 2015)







Safer Roads

8,200 fewer crashes per year, resulting in \$550 million saved.



CONGESTION





50% more hours of vehicle delay (compared with 2015)







More Free Time

1.46 million fewer hours of vehicle delay per year



EQUITY



Reduced Access

The number of people who have no ready access to a vehicle (including some elderly, low income and disabled households) increase by 18,000 compared with 2015.





Fewer Barriers

91,000 people who would otherwise face mobility challenges enjoy a range of travel options enabled by coordinated deployment of new mobility technologies.





AIR QUALITY



Moderate Pollution

Gasoline and diesel-powered vehicles are responsible for 33% of the state's greenhouse gas emissions, increasing their annual output of pollutants by 4.5 million metric tons over 2010 levels.





Cleaner Air

Electric vehicles emit 41% less carbon per mile than gaspowered vehicles







Meet our Mile High Travelers



MARIA is a 22-year-old mother who lives in Aurora. She is a student at Metro State University who also works part time at a restaurant in downtown Denver. Her pride and joy is her 4-year old son Gabriel, who is taken care of by Maria's mother each day.



TONYA is a 34-year-old Colorado native who lives in Boulder and is married with two young children.



JORDAN is a 29-year-old who recently moved to Denver from the Bay Area. Central Denver is not affordable for him, so he bought a home in Parker, which also provides him a yard for his doa.



CARL is middle-aged and married with a teenage son. His biggest concern is a recent health issue that is beginning to limit his mobility and forcing him to walk with a cane.



DAN is a 75-year-old semi-retired professor who is married and lives in a South Denver neighborhood.





DAILY TRAVEL EXAMPLE



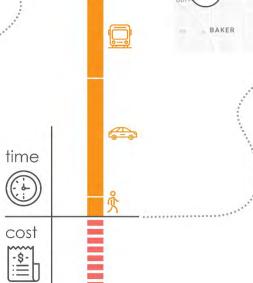
MEET MARIA

Maria is a 22-year-old mother who lives in Aurora. She is a student at Metro State University who also works part time at a restaurant in downtown Denver. Her pride and joy is her 4-year old son Gabriel, who is taken care of by Maria's mother each day.

DAILY TRAVEL

Aurora > Five Points > Metro State > Downtown Denver > Five Points > Home

Getting back and forth between my home, school, job and mother's home takes a long time each day. My car is becoming a money pit, always needing repairs I can't afford."



110 minutes MOBILITY GRIDLOCK

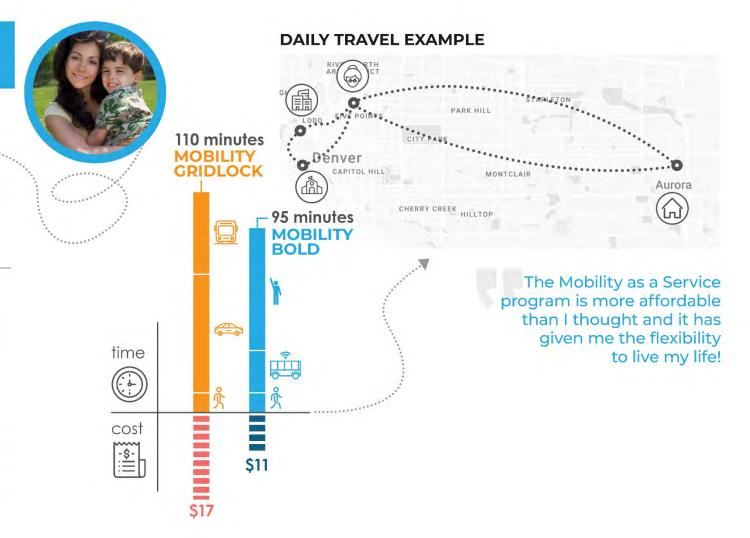


BENEFITS

The microtransit service is great for getting around downtown with more direct options which saves me time.

The time savings in my commute allow me to work an extra hour at the restaurant or spend more time with my son.

Sometimes my mom takes my son Gabriel downtown to ride the driverless microshuttle as an afternoon adventure. He loves it!"







MEET TONYA

Tonya is a 34-year-old Colorado native who lives in Boulder and is married with 3 young children.

DAILY TRAVEL

Boulder > Two School Drop-offs > Errands > Gym > Home > Pick-up Kids > After School Activities > Home



cost

DAILY TRAVEL EXAMPLE





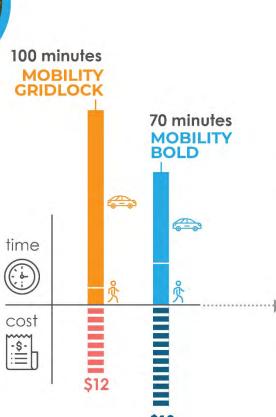
BENEFITS

Mountain highway technology alerts for winter conditions make it easy for us to avoid weekend travel delays.

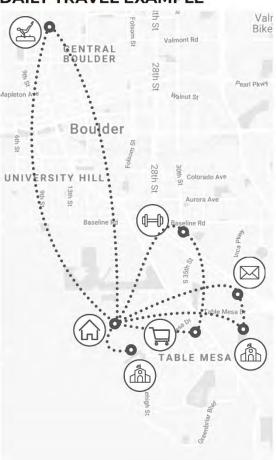
My husband is trying new mobility options that allow him to work during his commute to the Federal Center. I love that this allows him to be home in time for dinner with the family.

My life is busy and active, but I have found ways to make the week flow more smoothly. I signed up for drone delivery grocery service from my local supermarket and it's great! That's one less errand I have to do."





DAILY TRAVEL EXAMPLE





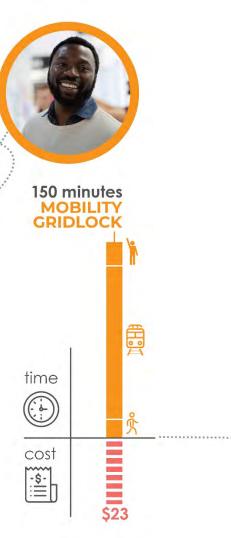


MEET JORDAN

Jordan is a 29-year-old who recently moved to Denver from the Bay Area. Central Denver is not affordable for him, so he bought a home in Parker, which also provides him a yard for his dog.

DAILY TRAVEL

Parker > Downtown Denver > Restaurant > Home



DAILY TRAVEL EXAMPLE



I live far from downtown, and my transit route is not flexible, so it's hard for me to stay connected with friends during the week. Overall, the effort and stress that it takes me to live here is more than I expected."

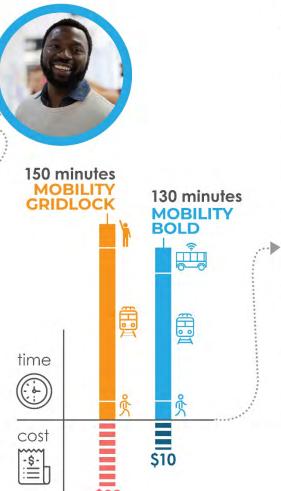


BENEFITS

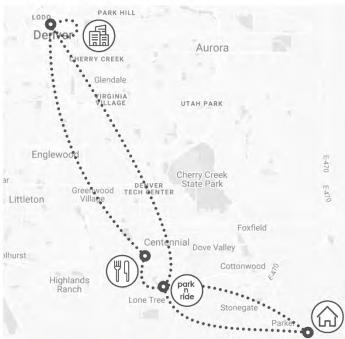
I like being productive and getting work done during my commute.

There are more options for First and Last Mile services to and from the new RTD station in Lone Tree.

Microtransit around Park Meadows make it convenient for me to explore the area after work and connect with friends.



DAILY TRAVEL EXAMPLE



The tech company I work for is creating some innovative new solutions to mobility-challenged communities. I've been using the new mobility app to get to work — sometimes by shared ride, sometimes by transit."



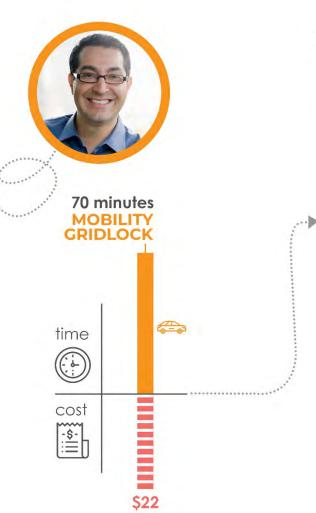


MEET CARL

Carl is middle-aged and married with a teenaged son. His biggest concern is a recent health issue that is beginning to limit his mobility and forcing him to walk with a cane.

DAILY COMMUTE

Green Valley Ranch > Airport > Sons Sports Practice/Games > Restaurant > Home



DAILY TRAVEL EXAMPLE



My wife commutes to Thornton for work each day. Traffic congestion just keeps getting worse and I find it negatively affects her mood when she comes home from work."

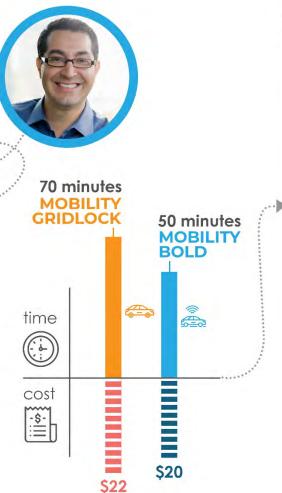


BENEFITS

With connected vehicles, my wife and I feel like we can relax a bit even when commuting.

Remote parking with a driverless shuttle has improved my travel experience. The pilot project at Denver International Airport is a first class service at a reduced monthly parking rate.

My son is in a new 'child-safe' on-demand shared ride service that he takes with his lacrosse teammates that I can track on my smartphone."



DAILY TRAVEL EXAMPLE



I'm a car geek, so everything about smart cars is intriguing, including the mobility options that may open up for me as my physical disability gets worse."





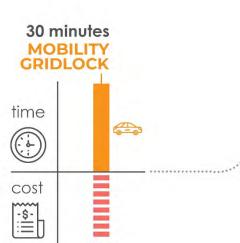


Dan is a 75-year-old semiretired professor who is married and lives in a south Denver neighborhood. He occasionally drives to the university in bad weather, but prefers to bike.

DAILY TRAVEL

Home > University > Grocery Store > Coffee > Home





DAILY TRAVEL EXAMPLE



I used to be very active in my community, but I'm feeling more limited now that it doesn't feel as safe or easy to bike or walk to where I want to go."

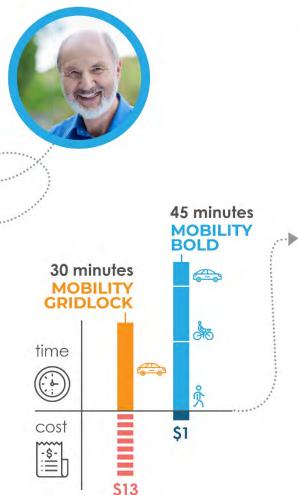


BENEFITS

We've noticed that traffic is being routed onto arterials, which means less neighborhood traffic and safety streets.

Converting on-street parking to more bike lanes and wider sidewalks makes it easier for us to get around.

I spend a lot less time driving and more time walking and biking for my neighborhood trips. Not only am I spending less money on transportation, my health is better and I feel great."



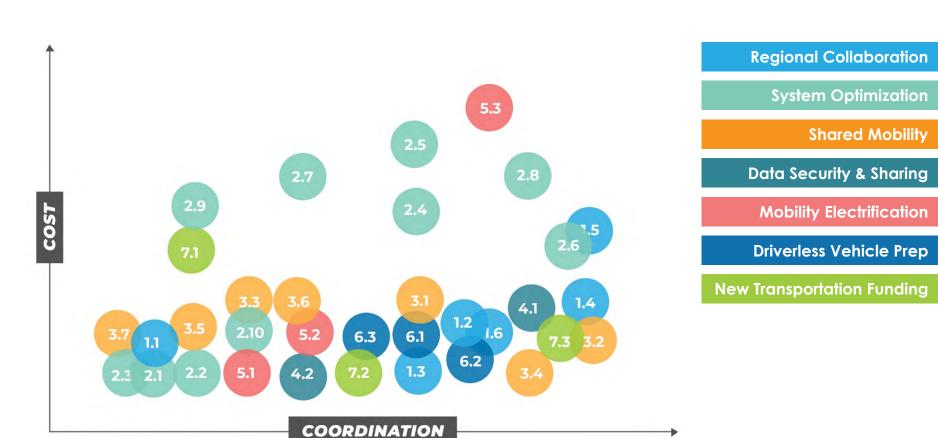
DAILY TRAVEL EXAMPLE



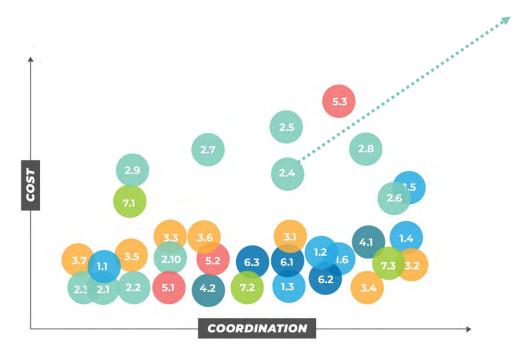
I feel safe and comfortable walking and biking around my community. There are new pedestrian detection systems in place at intersections in our neighborhood and new separated bike lanes that allow me to not only bike to the university, but also to my library and coffee shop." Moving Forward



Level Of Investment & Coordination



Medium Cost & Medium Coordination





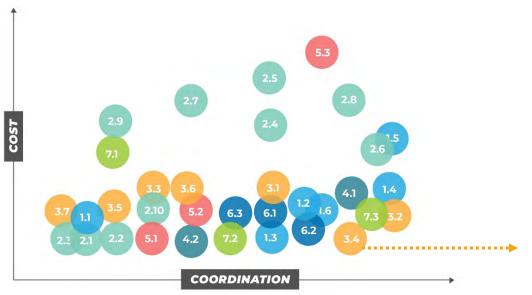
System Optimization

2.4 Implement transit priority on all major bus corridors

TACTIC INITIATOR RTD

ADDITIONAL PARTICIPANTS
Cities, counties, CDOT

Low Cost & High Coordination



3.4 Implement curbside management standards

TACTIC INITIATOR

DRCOG, RTD

ADDITIONAL PARTICIPANTS

New mobility entity, cities, counties



Shared Mobility

Action Initiators



Initiator: CDOT

- 1.1 Establish a mobility technology advisory committee
- 1.2 Establish a new public-private partnership mobility entity or entities to pursue mobility technology implementation
- 1.5 Develop regional guidelines for drone delivery and drone passenger travel
- 2.2 Prepare for technology upgrades and interoperability in project development of transportation projects
- 2.7 Implement "smart corridor" operations on all regional freeways.
- 2.8 Coordinate traffic management center systems and operations
- 2.9 Pilot mobility technologies on mountain corridors
- 2.10 Pilot modular lanes
- 4.1 Establish a regional mobility data platform
- 5.3 Transition government fleets to electric and other zero-emission vehicles
- 6.2 Minimize zero occupancy and encourage high shared use of driverless automated vehicles
- 6.3 Support Legislative efforts to ensure that automated vehicles operate safely
- 7.2 Explore the concept of a road usage charge for Colorado

Regional Collaboration

System Optimization

Shared Mobility

Data Security & Sharing

Mobility Electrification

Driverless Vehicle Prep

New Transportation Funding

Initiator: DRCOG

- 1.1 Establish a mobility technology advisory committee
- 1.2 Establish a new public-private partnership mobility entity or entities to pursue mobility technology
 implementation
- 1.3 Engage university resources to develop technology mobility research and development
- 1.6 Establish a regional smart mobility navigator
- 2.1 Evaluate technology upgrades and interoperability in projects in DRCOG's Transportation Improvement
 Program
- 2.2 Prepare for technology upgrades and interoperability in project development of transportation projects
- 2.5 Implement smart traffic signal control technology on all major regional arterial corridors
- 2.6 Pilot integrated corridor management on ten arterial corridors
- 3.2 Adopt a regional compact defining common standards for micromobility services
- 3.4 Implement curbside management Standards
- 3.5 Pilot neighborhood-scale mobility hubs
- 3.6 Partner with the private sector to provide transportation in mobility-challenged communities

Initiator: DRCOG (CONT.)

- 4.1 Establish a regional mobility data platform
- 4.2 Establish data sharing requirements for private sector roadway users
- 5.1 Incentivize ridehailing and ridesharing providers to use electric vehicles
- 5.3 Transition government fleets to electric and other zero-emission vehicles
- 6.2 Minimize zero occupancy and encourage high shared use of driverless automated vehicles
- 7.1 Expand DRCOG funding earmark for a mobility technology innovation fund

Initiator: RTD

- 1.1 Establish a mobility technology advisory committee
- 1.2 Establish a new public-private partnership mobility entity or entities to pursue mobility technology implementation
- 1.4 Make Mobility as a Service available to all
- 2.4 Implement transit priority on all major bus corridors
- 3.1 Develop a universal mobility app for trip planning and payment
- 3.3 Develop incentives to improve ridehailing and ridesharing operations
- 3.4 Implement curbside management standards
- 3.5 Pilot neighborhood-scale mobility hubs
- 3.6 Partner with the private sector to provide transportation in mobility-challenged communities
- 3.7 Pilot smart parking at Park-n-Rides
- 4.1 Establish a regional mobility data platform
- 5.3 Transition government fleets to electric and other zero-emission vehicles
- 6.1 Pilot driverless microtransit to increase public exposure to automated vehicle technology

Regional Collaboration

System Optimization

Data Security & Sharing

Shared Mobility

Mobility Electrification

Driverless Vehicle Prep

Initiator : Denver Metro Chamber

Regional Collaboration

Data Security & Sharing

Mobility Electrification

New Transportation Funding

- 1.1 Establish a mobility technology advisory committee
- 1.2 Establish a new public-private partnership mobility entity or entities to pursue mobility technology implementation
- 4.1 Establish a regional mobility data platform
- 5.2 Create an electrified mobility development program
- 7.3 Support legislative efforts to ensure that driverless automated vehicles generate appropriate funding

Initiator: Cities & Counties

- 2.3 Accelerate testing of bicycle/pedestrian detection at crossings
- 3.3 Develop incentives to improve ridehailing and ridesharing operations



Thank You

Questions?



mobilitychoiceblueprintstudy.com



Establish a mobility technology advisory committee

THEME

Funding & Finance
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD, Denver Metro Chamber

ADDITIONAL PARTICIPANTS

New mobility entity



Establish a new public-private partnership mobility entity or entities to pursue mobility technology implementation

THEME

Human Experience
Funding & Finance
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD, Denver Metro Chamber

ADDITIONAL PARTICIPANTS

N/A



Engage university resources to develop technology mobility research and development

THEME

Safety
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

New mobility entity, university collaborative



Make Mobility as a Service available to all

THEME

Human Experience

TACTIC INITIATOR

RTD

ADDITIONAL PARTICIPANTS

New mobility entity, nonprofit organizations, human services providers



Develop regional guidelines for drone delivery and drove passenger travel

THEME

Safety
Human Experience
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

Federal Aviation Administration, state legislature, Denver Metro Chamber



Establish a regional smart mobility navigator

THEME

Infrastructure Governance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

CDOT, RTD, cities, counties



Evaluate technology upgrades and interoperability in projects included in DRCOG's Transportation Improvement Program

THEME

Infrastructure Governance

TACTIC INITIATOR

DRCOG

ADDITIONAL PARTICIPANTS

New mobility entity



Prepare for technology upgrades and interoperability in project development of transportation projects

THEME

Infrastructure Governance Efficiency & Sustainability

TACTIC INITIATOR

CDOT, DRCOG

ADDITIONAL PARTICIPANTS

New mobility entity



Accelerate testing of bicycle/pedestrian detection at crossings

THEME

Safety Human Experience Efficiency & Sustainability

TACTIC INITIATOR

Cities, counties

ADDITIONAL PARTICIPANTS

N/A



Implement transit priority on all major bus corridors

THEME

Human Experience
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR RTD

ADDITIONAL PARTICIPANTS

Cities, counties, CDOT



Implement smart traffic signal control technology on all major regional arterial corridors

THEME

Safety Efficiency & Sustainability

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

Cities, counties, CDOT



Pilot integrated corridor management on ten arterial corridors

THEME

Safety Efficiency & Sustainability

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

CDOT, RTD, cities, counties, new mobility entity



Implement "smart corridor" operations on all regional freeways

THEME

Safety
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

Cities, counties, DRCOG



Coordinate traffic management center systems and operations

THEME

Safety
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS DRCOG, cities, counties



Pilot mobility technologies on mountain corridors

THEME

Safety Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

New mobility entity, I-70 Mountain Corridor Coalition



Pilot modular lanes

THEME

Safety
Efficiency & Sustainability
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS N/A



Develop a universal mobility app for trip planning and payment

THEME

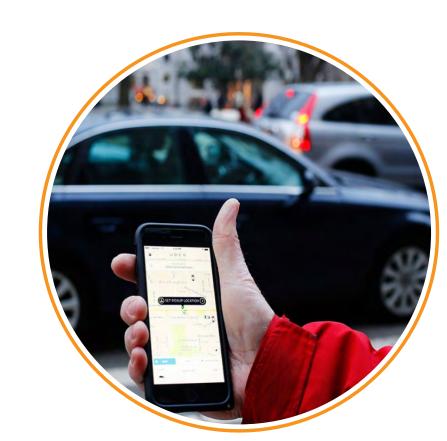
Human Experience

TACTIC INITIATOR

RTD

ADDITIONAL PARTICIPANTS

New mobility entity, E-470 Public Highway Authority, Northwest Parkway Public Highway Authority



Adopt a regional compact defining common standards for micromobility services

THEME

Safety Infrastructure Governance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

Cities, counties



Develop incentives to improve ridehailing and ridesharing operations

THEME

Safety Human Experience

TACTIC INITIATOR

RTD, cities, counties

ADDITIONAL PARTICIPANTS DRCOG



Implement curbside management standards

THEME

Safety Human Experience Efficiency & Sustainability

TACTIC INITIATOR

DRCOG, RTD

ADDITIONAL PARTICIPANTS

Cities, counties, new mobility entity



Pilot neighborhoodscale mobility hubs

THEME

Human Experience Efficiency & Sustainability

TACTIC INITIATOR

DRCOG, RTD

ADDITIONAL PARTICIPANTS

Cities, counties, new mobility entity, transportation management associations



Partner with the private sector to provide transportation in mobility-challenged communities

THEME

Human Experience Efficiency & Sustainability

TACTIC INITIATOR

RTD, DRCOG

ADDITIONAL PARTICIPANTS

Cities, counties, neighborhood groups, transportation management associations



Pilot smart parking at Park-n-Rides

THEME

Efficiency & Sustainability Infrastructure Governance

TACTIC INITIATOR RTD

ADDITIONAL PARTICIPANTS

New mobility entity



Establish a regional mobility data platform

THEME

Human Experience
Infrastructure Governance

TACTIC INITIATOR

CDOT, DRCOG, RTD, Denver Metro Chamber

ADDITIONAL PARTICIPANTS

Cities, counties, National Renewable Energy Laboratory, universities, new mobility entity, Colorado Office of Information Technology



Establish data sharing requirements for private sector roadway users

THEME

Infrastructure Governance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

New mobility entity, cities, counties



Incentivize ridehailing and ridesharing providers to use electric vehicles

THEME

Efficiency & Sustainability

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS

New mobility entity



Create an electrified mobility development program

THEME

Efficiency & Sustainability

TACTIC INITIATOR

Denver Metro Chamber

ADDITIONAL PARTICIPANTS

Utility companies, Public Utilities Commission, state legislature



Transition government fleets to electric and other zeroemission vehicles

THEME

Efficiency & Sustainability

TACTIC INITIATOR

CDOT, DRCOG, RTD

ADDITIONAL PARTICIPANTS

Cities, counties, Colorado Energy Office, Regional Air Quality Council



Pilot driverless microtransit to increase public exposure to automated vehicle technology

THEME

Human Experience Efficiency & Sustainability

TACTIC INITIATOR RTD

ADDITIONAL PARTICIPANTS

New mobility entity, cities, counties, CDOT, DRCOG, transportation management associations



Minimize zero occupancy and encourage high shared use of driverless automated vehicles

THEME

Efficiency & Sustainability

TACTIC INITIATOR

CDOT, DRCOG

ADDITIONAL PARTICIPANTS

State legislature, ridehailing providers



Support legislative efforts to ensure that automated vehicles operate safely

THEME

Safety
Infrastructure Governance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

USDOT, Denver Metro Chamber, state legislature



Expand DRCOG funding earmark for a mobility technology innovation fund

THEME

Funding & Finance

TACTIC INITIATOR DRCOG

ADDITIONAL PARTICIPANTS N/A



Explore the concept of a road usage charge for Colorado

THEME

Funding & Finance

TACTIC INITIATOR CDOT

ADDITIONAL PARTICIPANTS

DRCOG, state legislature, Denver Metro Chamber



Support legislative efforts to ensure that driverless automated vehicles generate appropriate funding

THEME

Efficiency & Sustainability
Funding & Finance
Infrastructure Governance

TACTIC INITIATOR

Denver Metro Chamber

ADDITIONAL PARTICIPANTS CDOT

