

## APPENDIX B.

# WORKING GROUP MEMBERSHIP AND MATERIALS

Working Group Description & Members

Presentations and Meeting Notes



## APPENDIX B

### WORKING GROUP MEMBERSHIP AND MATERIALS

# Working Group Description & Members





## Stakeholder Working Group and Interested Parties

Participants in the Stakeholder Working Group (Working Group) were selected based on guidance from SB 19-239. CDOT executive leadership staff invited qualifying individuals via letter, with follow-up phone calls and email contact. The membership organizations and representatives are listed in the table below.

### Working Group Member Organizations and Representatives per SB 19-239

SB 19-239 Guidance	Organization	Representative
State government employees—an employee of the department who is not an employee of the High-Performance Transportation Enterprise	Department of Transportation	Shoshana Lew/ Sophie Shulman
State government employees—an employee of the Colorado Energy Office	Colorado Energy Office	Will Toor/Christian Williss
State government employees—an employee of the Department of Revenue	Department of Revenue/ Department of Motor Vehicle	Kevin Kihn/Jenny Adler
State government employees—the chief of the Colorado State Patrol or the chief's designee	Colorado State Patrol	Mark Savage
Representatives of state and local governments and transportation planning entities—representative of a statewide organization that represents the interests of counties	Adams County	Commissioner Chaz Tedesco Kevin Bommer/ Morgan Cullen
Representatives of state and local governments and transportation planning entities—representative of a statewide organization that represents the interests of municipalities	Denver Regional Council of Governments	Doug Rex
Representatives of state and local governments and transportation planning entities—A representative of rural transportation planning organizations	Southwest Transportation Planning Region	Amber Blake
Business representative—Two representatives of transportation network companies	Uber	Piper Overstreet- White
Business representative—Two representatives of transportation network companies	Lyft	Jake Swanton
Business representative—A representative of a business that has expertise regarding the technology and processes required to develop, implement, and administer a road usage charge program	KPMG	David Spector
Business representative—A representative of certificated taxi carriers	Freedom Cabs	Magath “Max” Sarr
Business representative—A representative of a rental car company	Enterprise	Meegan Wood- Trombley
Business representative—A representative of a business that is a peer-to-peer car sharing program	Drift	Manolo Morales

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**Working Group Member Organizations and Representatives per SB 19-239**

<b>SB 19-239 Guidance</b>	<b>Organization</b>	<b>Representative</b>
Business representative— <i>A representative of a car sharing network company that does not use a peer-to-peer car sharing business model</i>	SHARENOW	Walter Rosenkranz
Business representative— <i>A representative of the freight advisory council</i>	Freight Advisory Committee	Greg Fulton
Business representative— <i>A representative of the contracting industry that works on or represents businesses that work on transportation infrastructure projects</i>	Colorado Contractors Association	Tony Milo/Jim Moody
Business representative— <i>A representative of the engineering industry</i>	Iron Stride Solutions	Lou Davenport
Business representative— <i>A representative of businesses that provide package delivery services to end users of the goods in the packages for other businesses</i>	Amazon	Jeff Cleland
Business representative— <i>A representative of businesses that hire drivers using personal vehicles for delivery</i>	CDOT invited Grubhub and DoorDash to participate in the Working Group and did not get a response	
Business representative— <i>A representative of businesses that hire drivers to use their personal motor vehicles to deliver their own goods to end users of the goods</i>	Auto Alliance	Steve Douglas
Business representative— <i>A representative of towing and recovery professionals of Colorado</i>	Denver West Towing	Rob Mooney
Business representative— <i>A representative of autonomous vehicle manufacturers</i>	EasyMile	Lauren Isaac
A labor representative	Teamsters Local 445	John Hennelly
A labor representative— <i>A representative of persons with disabilities</i>	Denver Regional Mobility & Access Council	Kate Williams
A labor representative— <i>A representative of persons who advocate for the protection of the environment</i>	Southwest Energy Efficiency Project (SWEET)	Travis Madsen
A labor representative— <i>A transportation network company driver</i>	Lyft	Ashley Kirchner
A labor representative— <i>Any other individuals who the department deems necessary or appropriate to include in the stakeholder group</i>	High Performance Transportation Enterprise (HPTE)	Nick Farber/Simon Logan

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Numerous additional interested parties representing a range of public and private entities participated at various levels throughout the process. The organizations are listed below.

- American Council of Engineering Companies (ACEC)
- Allstate
- Axiom Politics
- Brandeberry McKenna Public Affairs (BBMK)
- Boulder County
- Colorado Association of Transit Agencies (CASTA)
- City and County of Denver
- City of Westminster
- Colorado Governor's Office
- Conservation Colorado
- CRL Associates
- Denver International Airport
- Denver South Economic Department Partnership
- Electrify America
- Ford Mobility
- Getaround
- InterMountain Public Affairs
- Kirchoff Group, Inc.
- LiveWell
- Michael Baker International
- National Car Changing
- North Front Range Metropolitan Planning Organization (NFRMPO)
- National Renewable Energy Laboratory (NREL)
- Northern Colorado Clean Cities (NCCC)
- Orrick
- Public Utilities Commission (PUC)
- Regional Air Quality Council (RAQC)
- Regional Transportation District (RTD)
- Service Employees International Union (SEIU)
- The Capstone Group LLC
- Turo
- Via



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**SWG Meeting 1 Notes  
and Presentation  
June 28, 2019**



## **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

### **Meeting # 1 June 28, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

#### **Stakeholder Working Group Meeting Attendance:**

The following people attended the meeting on June 28<sup>th</sup>. Names with an asterisk (\*) are members of the identified Stakeholder Working Group (SWG). Names with 2 asterisks (\*\*) are organizational delegates of specific SWG members. For a complete list of all of the SWG members, please see Appendix A.

Somayeh Aliebrahimi, Colorado State University  
Jonathan Bartsch, CDR and Associates  
Jennifer Carpenter, Michael Baker International  
Megan Castle, CDOT  
Jeff Cleland, Amazon\*  
Kathleen Collins, CDOT  
Morgan Cullen, CML\*  
Chaz Tedesco, Adams County Commissioner\*  
Lou Davenport\*  
Steve Douglas, Auto Alliance\*  
Tess Ellender, CDOT  
Nick Farber, HPTE\*  
Greg Fulton, FRAC\*  
Landon Gates, LiveWell  
Julie George, LiveWell  
Erin Goff, Axiom Politics  
Chris Hansen, House District 6  
John Hennelly, Teamsters Local 445\*  
Lauren Isaac, Easymile\*  
Elise Jones, Boulder County  
Michael King, CDOT  
Timothy Kirby, CDOT  
Pete Kirchhof, Getaround  
Tatjana Kunz, CDOT  
James Lester, Department of Regulatory Affairs  
Shoshana Lew, CDOT\*  
Simon Logan, HPTE  
Suzette Mallette, NFRMPO  
Mary Marchun, The Capstone Group LLC.  
Lauren Masias, Denver South Economic Department Partnership  
Erika Miller, Colorado State University  
Jim Moody, CCA\*  
Manolo Morales, Drift\*  
Piper Overstreet-White, Uber\*  
Cynthia Patton, Strategic Advisor City of Denver  
Carla Perez, HDR

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Ann Rajewski, CASTA  
Melissa Rary, CDR and Associates  
Totsy Rees, Enterprise  
Doug Rex, DRCOG\*  
Walter Rosenkranz, SHARENOW\*  
Magath "Max" Sarr, Freedom Cabs\*  
Mark Savage, CSP\*  
Michelle Scheuerman, CDOT  
Anita Seitz, Mayor Pro Tem of Westminster  
Jep Seman, JPS Law  
Sophie Shulman, CDOT\*\*  
Melanie Sloan, Adams County  
David Spector, KPMG\*  
Lisa Streisfeld, CDOT  
Jake Swanton, Lyft\*  
Will Toor, CEO\*  
Avery Turman, Capstone Group LLC.  
George Twigg, Boulder County Commissioners Office  
Megan Wagner, BBMK  
Kate Williams, DRMAC\*  
Nicholas Williams, Administrator City of Denver  
Christian Williss, CEO\*\*  
Meegan Wood-Trombley, Enterprise  
Melissa I. Young, Allstate  
RJ Harrington, National Car Charging  
John Ehmsen, CSP  
Kevin Kihn, DOR/DMV\*  
Sheble McConnellogue  
Dorthy Jones, DMCC  
Johanna Jamison, SHARENOW  
Ethan Wilson, Turo  
Tim Stewart, E-470  
Ashley Kirchner, Lyft\*  
Cammie Grant  
Danielle Glover, CRL associates  
Andy Karsian, Colorado Department of Transportation  
Matt Inzeo, Colorado Department of Transportation  
Maria Nakagawa, Colorado Department of Transportation

#### **Via Telephone:**

Travis Madsen, Southwest Energy Efficiency Project (SWEEP)\*  
Zoe DeVito, Via Mobility Services



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Maria DiBiase Eismann, Colorado Energy Office

### Introductions

The meeting was facilitated by Jonathan Bartsch of CDR. Attendees were welcomed and Stakeholder Working Group members were asked to introduce themselves. **Note:** For a full list of attendees, please see **Appendix A – Meeting Attendee List**.

### Purpose and Content of Colorado Senate Bill 19-239

(See **Appendix C** for the copy of the Powerp Point Slides displayed at the meeting.)

Both CDOT Executive Director Shoshanna Lew and Will Toor, Executive Director of the Colorado Energy Office, provided an overview of Senate Bill 19-239.

Executive Director Lew thanked everyone for coming to the meeting, and thanked representatives for helping with the drafting of the bill some who are here today and others who are not including: Senators Faith Winter and Jeff Bridges, and Representatives Matt Gray and Chris Hansen. County Commissioners present were recognized: Chaz Tedesco of Adams County and Elise Jones of Boulder County.

- State legislators have requested information regarding emerging mobility and its impact and also the creation of this Working Group.
- The bill's precedence was based on the identified need to examine impacts of emerging mobility companies and their potential effect on greenhouse gas emissions. Mobile apps now allow real time communications for on-demand transportation and delivery services. In terms of on-demand transportation services, there is potential to increase congestion and vehicle emissions if not used judiciously, and that is why we are here today – to work together to mitigate air quality and congestion impacts and develop a report as required by the legislation, due November 1, 2019 to the Colorado Department of Transportation.
- The report will quantify the impact of emerging mobility in terms of its pressure on the transportation infrastructure, and in the air.
- The report we develop will be a component of the annual Joint Budget Committee report from CDOT. This Stakeholder Working Group will also have subcommittees.
- This is a great team from CDOT, CEO and others. This is an exciting time and opportunity to bring folks together for this important discussion.
- Executive Director Lew also thanked staff in attendance from other partner agencies, more specifically, from Colorado Energy Office, Colorado State Patrol, Colorado Department of Revenue and the Public Utilities Commission.

Will Toor, Executive Director of the Colorado Energy Office, noted that Executive Director Lew did a great job of highlighting the purpose of SB 19-239. Aside from SB 19-239, SB 19-1261 states: *Colorado shall have*

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*statewide goals to reduce 2030 greenhouse gas emissions by at least 50%, and 2050 greenhouse gas emissions by at least 90% of the levels of greenhouse gas emissions that existed in 2005.*

- Electricity – the trajectory for this is moving in the right direction, as the higher emissions sources are not less economically desirable with the oncoming renewable sources of wind and solar. However, this is not the case with transportation. Electric vehicle (EV) percentage increases on the road by 2030 will also need to consider increasing the efficiency of use of vehicles.
- Autonomous vehicle (AV) technology is coming and we need to harness business models and maximize efficiency to promote cleaner air. These are important issues to deal with. Here we will start to set the structure for how Colorado can prepare for and address trends coming forward.

## Emerging Mobility Impact Study (EMIS) Goals and Objectives

Sophie Shulman, CDOT Chief of Innovative Mobility, provided an overview of key factors arising that are affecting transportation, which include:

- Rapid population growth occurring and anticipated along the I-25 corridor.
- Costs of delay is anticipated to increase with total delay estimated at \$85.5 million per year (per 2018 Texas Transportation Institute Study) for the top 100 most congested corridors in Colorado, if issues aren't addressed.
- Governor's goals via Executive Order B 2019-002 is to transition to zero emission vehicles.
  - Working groups are requested to focus on strategies to reduce traffic congestion and improve air quality. More specifically:
    - Increase number of passengers per vehicle
    - Decrease number of cars on the road
    - Manage demand
    - Reduce GHG emissions
    - Change Internal Combustion Engine (ICE) to EVs
    - Fund and construct EV charging infrastructure
- Future trends in transportation thanks to technology are anticipate to positively impact safety and better connections with multimodal transportation, this is also important for the Working Group to keep in mind.
- Robin Chase Quote captures the essence of the challenge we face:
  - *"Our urban and suburban spaces could become a heaven or a hell in the near future depending on the way we choose to let new services and technology. We are seeing the rise of technology as an asset and we are also seeing that the value of a car-dominant city has reached its zenith...The city regulatory and physical infrastructure has been built on a personal car-dominant infrastructure."*
- A Quick Overview of SB 239 was described:
  - **S.B. 19-239: Address Impacts of Transportation Changes**

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- Concerning means of addressing the impacts of technological and business model changes related to commercial vehicles, and, in connection therewith, requiring the Department of Transportation to convene and consult with a stakeholder group to examine impacts of new transportation technologies and business models, identify means of addressing impacts, and report findings and make recommendations to the general assembly.
- Coordinate with key stakeholders including:
  - Elected Officials
  - Stakeholder Working Group Members
  - Colorado Department of Transportation
  - Colorado Energy Office
  - Facilitator
  - Colorado State University
  - Interested Parties
  - Members of the Public
- Sophie recognized Lisa Streisfeld, Assistant Director of Mobility Services, and Tatjana Kunz, CDOT Intern, for their work to coordinate this substantial and important effort.

### Emerging Mobility Impact Study (EMIS) Content and Working Group Input

- Lisa Streisfeld provided an overview of the packet content that was distributed as a handout to attendees that included an agenda, brief overview of SB 19-239, Suggested list of subcommittees with descriptions, and a draft document of Stakeholder Working Group protocols. See **Appendix C – Meeting Packet** to review these materials.
- To get everyone on the same page, having a shared understanding of key terms is important. Lisa reviewed the definition of “a motor vehicle used for commercial purposes” from SB 19-239, as follows:
  - "Motor vehicle used for commercial purposes" means a motor vehicle that is used to provide passenger transportation services purchased through a transportation network company, as defined in section 40-10.1-602 (3), a peer-to-peer car sharing company, a car sharing company that does not use a peer-to-peer business model, or a company that provides taxicab service as defined in section 40-10.1-101 (19), a motor vehicle that is rented out by a rental car company, and a motor vehicle that is used for residential delivery of goods.
  - In addition, what is **NOT** included under the term of motor vehicle used for commercial purposes was explained:
    - I. A motor vehicle used to deliver goods that is used only to deliver goods
      - A. To addresses other than residences; or

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- B. That are delivered as freight;
  - II. A motor vehicle that has a gross vehicle weight rating more than fourteen thousand (14,000) pounds; or
  - III. A motor vehicle that is operated for the purpose of transporting passengers:
    - A. Under a contract with the Regional Transportation District (RTD) created in Section 32-9-105, a Regional Transportation Authority created pursuant to Park 6 of Article 4 of this Title 43, or any other governmental or public entity; or
    - B. By a common carrier, as defined in Section 40-1-102(3), except as otherwise provided in Subsection (3)(a) of this section.
- Key tasks for the Emerging Mobility/Technology Impact Study were explained and include:
  1. Examine the economic, environmental, and transportation system impacts of the adoption of new and emerging technologies and transportation business models;
  2. Receive information and recommendations from the Freight Advisory Council regarding current and evolving practices related to the residential delivery of goods;
  3. Quantify the amount of carbon emissions that can be eliminated through different means of incentivizing and supporting the use of ZEV (zero emission vehicles) motor vehicles used for commercial purposes;
  4. Examine the requirement for TNCs (Transportation Network Companies) to provide proof of medical fitness; and
  5. Assess implementation costs of proposed changes
- Final recommendations of the study must:
  1. Include a means of addressing the impacts that increase positive impacts and mitigate negative impacts;
  2. Determine whether fees should be levied upon the use of motor vehicles used for commercial purposes; the fees should consider the following:
    - Mitigate the impacts to the transportation system resulting from the increasing use of motor vehicles used for commercial purposes;
    - Fund infrastructure, (for multi-modal options and to support the adoption of ZEVs);
    - Defray costs of fee collection;
    - Incentivize adoption of ZEVs for commercial purposes; and
    - Incentivize multiple passenger ride sharing for commercial vehicles used for commercial purposes and the use of such vehicles as a first and last mile solution for public transit users
  3. Identify potential fees that CDOT could promulgate rules to implement Stakeholder Working Group and Legislative recommendations.
  4. Develop an implementation strategy
    - o How fees could be calculated and imposed, including but not limited to:

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- flat or variable
    - per trip/mileage bases or a combo of such
    - different rates on different classes of vehicles
    - different rates at different locations, time of day or based on real time analysis
    - waive or reduce for those vehicles used for first and last mile solution for public transit
    - cap at one or more maximum amount
    - o What schedule, stages and rates should the fees should be imposed?
  - Lisa ended this segment of the meeting with an overview of:
    - o Schedule for the study's development and how recommendations will proceed for presentation to the Colorado legislators with an October 1, 2020 deadline for promulgating rules,
    - o Key tasks and accomplishments proposed for future Stakeholder Working Group meetings,
    - o Relationship between subcommittees and the Stakeholder Working Group
    - o Overview of the draft descriptions of Sub-Committees, from information provided in the meeting packet.
    - o Lisa also noted that homework will be distributed to Stakeholder Working Group and sub-committee members in between meetings.
- Note:** For more details on what was presented see **Appendix C** – SB 19-239 Presentation.
- Representative Hansen noted that SB 267 in the next years represents a massive new investment coming and we should consider spending it in a way that prepares for the future. Make sure the funds are “future proof”.

### Activity: Defining Success for the EMIS Recommendations

- Jonathan Bartsch facilitated the activity to identify what success would look like EMIS Working Group. It was noted that this is a short, very tight time frame for the work to be accomplished.
- A Stakeholder Working Group member noted that in order to make good decisions we need data, information, and some questions answered.
- Sophie ensured attendees that all presentations and documents discussed today will be sent out to folks. In addition, a summary of a literature review is coming up on today's agenda.
- The first activity Jonathan facilitated was having each attendee turn to their neighbor to discuss how they we define success for this process. This activity took roughly five to ten minutes.
- Next Jonathan went around the table of Working Group members to have each one describe what success would look like to them.
  - o Ann Rajewski (CASTA) – Making it easy to transfer from mode to mode; leave car at home and use other options.

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- Working Group member noted that success would be that alternative fuel vehicles can use dedicated lanes for free – e.g., EVs. Elise Jones (Boulder County) – Supports existing system investments and does not undermine them.
- Per a Working Group member, conduct a broad assessment – all types of vehicle miles traveled – being holistic
- Piper Overstreet-Winter (Uber) - Equitable solutions across the board and does not disincentivize businesses and technology
- Doug Rex (DRCOG) – Continues to diversify transportation portfolio and recognizes future technology that is integrated and connected
- Travis Madsen (SWEEP) noted that to include in our recommendations that come out of this process ideas for other stakeholders. For example, Xcel could partner with commercial vehicle companies to provide incentives for drivers to obtain EVs for work use as part of their Transportation Electrification Plan (SB 77), which they are designing now
- Another Working Group member commented, policies that look to the future – this is mobility, it will look different in the future – understand what a commercial vehicle is, keep future in mind –autonomous. Car sharing will not necessarily take over. Car sharing wants to fit in
- Chaz Tedesco (Adams County) – County equity, regarding incentives and fees we will need to be careful; regarding EV incentives – they still use the roads and would reduce revenues in the process, need to consider ICE and impacts too. To exclude car users is inequitable in areas where that is the only option. Major roads of state all run through Adams County, don't exclude us on ongoing projects.
- Greg Fulton (CMCA) – There is no single bullet to reduce GHG emissions. Technology is evolving with EVs and hydrogen coming on along with renewable diesel and natural gas. Look at incentives vs. disincentives. Consider strategies and technology working better in varying uses. Work on reducing emissions instead of one particular technology.
- David Spector (KPMG) – Equity making sure to take into account best practices – recommendations that fit in Colorado's economic limits locally and tiered. Related to TABOR and enterprises, need to consider the bigger perspective, and how many dollars go to the General Fund and assessed fees, etc. This big picture is not for us to resolve, but to keep in mind.
- Mark Savage (CSP) – Transportation engineering associations are looking at emerging technologies and the integration of safety and how emerging technology will impact funding sources – there are several overarching considerations at play.
- Kate Williams (DRMAC) – Seeing more people and more freight in less vehicles would be a success.
- Jake Swanton (Lyft) – The types of vehicles are important. Talk about regulations that promote innovation too. Through Lyft and ridesharing it would be the fastest avenue to EVs on the road. Medical certification requirement is an obstacle.



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- Steve Douglas (Auto Alliance) – New cars are 70% of the market, and the focus should be on reducing emissions and vehicle miles traveled (VMT). How to integrate policy with new technology there are a lot of unknowns. We need to get out in front to shape technology benefits to society as a whole reducing GHGs and congestion.
- Walter Rosenkranz (ShareNow) – Agrees with Steve Douglas from Auto Alliance, congestion and emissions are the issue. Hopefully, the Working Group will come up with a market force and incentivize a structure that pulls operators and the public toward low emissions and congestion options.
- Travis Madsen (SWEEP) – Concur with reducing energy use and promoting zero emissions. Listening in on the conversation via the phone.
- Max Sarr (Freedom Cab) – Less congestion means less cars on the street. It would be very useful for Working Group to consider a cap on TNC vehicles or at least restrict the types of vehicles on the road. Taxi Cabs have a cap number – do the same for ride share. It would be very good to think about a cap for TNCs.
- Jim Moody (CCA) – At the end of the process advance the ball for transportation funding and not exacerbate the situation.
- Another comment from a Working Group member is that there is a \$20 billion shortfall; we need long-term solutions when you consider cities and counties.

### **Working Group Protocols**

- Jonathan Bartsch facilitated a discussion on Stakeholder Working Group operating protocols that were included as a document in the packet distributed to meeting attendees.
- There is time to take the document back and review it before the document is finalized.
- The goal is to provide most meeting materials in advance so members can come informed to meetings to offer their comments.
- Today we just would like your initial reactions to the proposed protocols for the Working Group.
  - The purpose of the Working Group is around collaboration and co-laboring as varying ideas bring about better results, but we will need to also work through issues and areas of disagreement.
  - Regarding the impacts of emerging mobility (and technology) we will need to think of them and strategies based on a common understanding of what is occurring related to them to form recommendations for the legislature.
  - In terms of Roles & Responsibilities – various parties and key players are identified
    - Jonathan asked if any entities might be missing from the list of key players.
    - Kate Williams noted that National Renewable Energy Lab (NREL) could also contribute to the process.
    - Jonathan noted that NREL could potentially be a subject matter expert (SME) that would be brought in to answer questions the Working Group members may have.

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- Greg Fulton requested that the Freight Advisory Council be noted as providing input in the Protocols document.
- In terms of each member's role, Jonathan explained it is anticipated that each member attends and prepares for meetings, and he hoped that each member would participate in at least one sub-committee. He solicited each member to think about their respective agency/organization and also the good of the entire Working Group when considering recommendations.
- The hope is to arrive at consensus, but we realize that may not be possible.
- Other items noted regarding Working Group Protocols
  - All meetings are public and will be recorded.
  - SWG member entity staff members may attend.
  - Sub-committees are not the decision makers – the Working Group is. (see Creation of Sub-committees for more details on Sub-Committees)
  - At the end of each Working Group meeting will be 10 minutes reserved for public comments.
  - In terms of communication with the media, this EMIS Stakeholder Working Group is a solution-oriented body and is not a venue to use media event to rally support for a specific cause.
  - It is anticipated that Sub-Committees will also meet from 9:00 – 12:00 on meeting days.
  - In terms of participation, we want to be sure all Working Group members are heard.
  - Protocols will include a process on how to handle disagreements and we will finalize protocols at the next meeting.
  - When members were asked to comment further on the protocols, no comments were raised.

### Activity: Working Group Sub-Committee Creation

- Jonathan Bartsch initiated the process to form sub-committees of the Stakeholder Working Group. The meeting packet contains a document that includes brief description of five proposed working groups, with options for others to be identified if deemed appropriate.
- The five proposed sub-committees, with room for others, include:
  - Sustainability: Incentivizing Vehicle Electrification
  - Natural Environmental Impact and Emissions Analysis
  - Congestion Management: Incentivize Shared Ridership
  - Fee Structure for Commercial Transportation Vehicles and TNCs
  - Social Impact and Equity Analysis
  - Others?
- Greg Fulton (CMCA) – Regarding incentivizing EVs, that the focus should be on zero emissions and the intent to move forward with reducing GHG emissions. It would take a lot to electrify freight



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vehicles. We want to move the dial through other means, not just through one promoting strategy. We need to consider multiple approaches to the end goal.

- Flip charts around the room with markers were introduced to Stakeholder Working Group members, with each flip chart labeled with one proposed Stakeholder Working Group
- Stakeholder Working Group members were asked to circle the room and fill-in the flip chart pages with ideas for the critical topics that should be discussed under each sub-committee.
- After a short break, Stakeholder Working Group members rotated around the room and filled-in the flip charts.

The results of the flip chart rotation to identify sub-committee topics were as follows:

#### **Sub-Committee 1: Sustainability – Incentivizing Vehicle Electrification**

- Enhanced ability to identify Plug-in EVs
- Incentivize personal vs. commercial/government
- Market support for electrification (OEMs, Utilities, users)
- Address supply constraints
  - Medical Certification Requirement
- Encourage zero emission transit/group ridership (shuttles, buses, etc.)
- Encourage group ridership and zero emission of emerging ATVs
- Consider state climate targets set in HB 1261 in this subcommittee or Subcommittee 2

#### **Sub-Committee 2 – Natural Environment Impact and Emissions Analysis**

- Solar incentives to offset electricity usage
- Limit time freight vehicles on travel and idling 18-wheelers emits as much pollutants as much as pollutants going 65 mph.
  - Subcommittees 2 and 3 are linked related to this topic
- Environmental impact of battery use, recycling, etc. with shift to electrification
- Public health impacts

#### **Sub-Committee 3 – Congestion Management: Incentivize Shared Ridership and New Mobility (e-Bikes, e-Scooters, etc.)**

- Use mass transit and make connections statewide
- Ease of use between modes
- Right mode matched for right trip/deploy transit vs. ride share based on the needs
- Consider time of travel for commercial motor vehicles (CMVs) during peak congestion– this would decrease emissions
- Consider marketing and outreach to get other businesses to enter the market of shared ridership.
- Addressing regulations/rules that discourage positive and innovative solutions (e.g., Medical Certification requirement)

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- If a separate safety committee is not formed, safety and mobility should be added here in addition to environmental impacts.
- Need more mention of public transit – its role, funding, etc.
- Consider new business models to increase shared ridership such as locker/package drop.
- Consideration for how batteries will impact carrying capacity of commercial delivery vehicles – Will this induce more vehicles on the road? More vehicle miles traveled (VMT)? Maybe less emissions but greater wear and tear. Quantify this?
- Is there a way to identify the number of people in a commercial vehicle?
- Analysis of consumer cost savings for the services the commercial vehicles provide.

#### **Sub-Committee 4 – Fee Structure for Emerging Motor Vehicles Used for Commercial Transportation Purposes**

- Since Colorado Road Safety has been put in place (FASTER Safety?), how much has been raised and what has it been used towards?
- How do we avoid TABOR Cap implications of a fee (fees) is imposed?
- Impact on transit dependent folks
- Finding equitable funding solutions at the state and local levels.
- Fee structure interrelated with incentives
- Fee structure should incorporate more global transportation funding/financing streams.
- Recognize unique attributes and emissions/congestion benefits of services when considering (Dis)incentives.
- Simple enough for everyone to understand/enforce.
- Fee structure should consider the transportation options available to the user – e.g., transit deserts.
- Fee structure needs to be considered in context – with managed lanes, additional funding needs to complete FasTracks, Regional Transportation funding ballot initiative, etc.
- Fee structure impacts to freight/fulfillment centers. These are typically in suburban locations. How will these charges be allocated/distributed (origin? Destination?, etc.) Freight fulfillment centers (FedEx, Amazon, etc.) are key industries.

#### **Sub-Committee 5 – Social Impact and Equity Analysis**

- How can these technologies be leveraged to improve safety?
- How to engage with disadvantaged populations to design technologies that make a meaningful difference?
- Ensure mobility options are available to all income levels.
- How to ensure rural communities aren't left behind.
- Ensure capacity for transit redistribution.

#### **Sub-Committee 6 – Other/Safety**

## **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

### **Meeting # 1 June 28, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

- What does the next generation want? Let's get input from 20-year olds.
- Scan policies beyond the scope of SB 19-239, to be holistic.
- AV (Autonomous Vehicles) safety inspections?
- AVs
- Last mile package/grocery delivery?

### **Sub-committee Comments and Discussion**

- Jonathan Bartsch noted that a sign-up sheets were going to be passed along to committee members for this to sign up for Sub-Committees. Stakeholder Working Group members were asked to raise their hands regarding the sub-committees they planned on signing up for to get a feel for the level of interest for each. Interest was expressed at an acceptable level of participation for all the sub-committees presented.
- Travis Madsen (SWEEP) expressed interest in all the Sub-Committees, but specific interest in Sub-committee 4 (unless it is put into all of the others), and Sub-Committee 2 – Natural Environment/Emissions.
- After the Sub-Committee topic exercise was finished, a discussion on the number and names of sub-committees took place. Comments were as follows:
  - Mark Savage (CSP) noted that safety should either be integrated into all Sub-Committees or be a standalone sub-committee. Mark was for the safety topic not being siloed.
  - Travis Madsen (SWEEP) commented that fees should be part of every other Sub-Committee along with all possible policy options in each sub-committee (fees and whatever else we could do); get representative from Denver Streets Partnership to be on Working Group and on Sub-Committee 5. Travis also asked if he could add a deputy from SWEEP, Matt Frommer, to participate in Sub-Committees 1 and 3.
  - A debate between Steve Douglas (Auto Alliance) and Kate Williams (DRMAC) over the timeline for AVs occurred. Steve felt it is further off, while Kate noted in some instances AVs are already here, with EasyMile.
  - Kate Williams (DRMAC) supported efforts to expand that operation and get folks to use it more to get to the airport train.
  - David Spector (KPMG) – Identified the need for a base data set to inform decisions and opinions
  - Lisa Streisfeld (CDOT) noted that a Literature Review is in process by CSU and preliminary results will be presented today. CDOT will also retain a consultant to model CAV penetration, and we have a statewide travel model. We hope all three will serve as a data set to inform decisions for the Working Group.
  - Sophie Shulman (CDOT) also solicited Stakeholder Working Group members and attendees to share ideas regarding additional data sources they are aware of that would help with informing the Stakeholder Working Group further on this topic.

## Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

### Meeting # 1 June 28, 2019

CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium

- Greg Fulton (CMCA) raised the issue of conflicts in existing rules and regulations and the need to be familiar with them before making any recommendations.
- Land use was cited as is an important aspect too. Not a one size fits all solutions. We may need a menu to pick from for the best fit strategy depending on the issue and its location/context.
- Lauren Isaac (EasyMile) noted that any data the state has would align with data at the federal level. Great lessons are being learned nationally.
- Lou Davenport (Iron Stride Solutions) added that safety from an emerging technology standpoint is very important, and Will Toor (CEO) also noted AV and where they fit in is also important.
- Lauren Isaac (EasyMile) said that once a federal bill is passed we can lean on this.
- John Hennelly (Teamsters Local 445) noted that Florida is already allowing AV testing and nationally this will happen quicker. We need to address this now seriously.
- It was decided that AV and Safety be one sub-committee as 7 Working Group members raised their hands in support of this concept.
- Sophie Shulman (CDOT) if you can't decide today which sub-committee to sign-up for, please contact Lily Lizarraga, who set up the calendar invitation for today.
- Elise Jones (Boulder County) asked if staff could serve on sub-committees.
- Sophie Shulman (CDOT) supported the concept of staff participation.
- Steve Douglas (Auto Alliance) asked if remote –webinar participation would be an option.
- Sophie Shulman (CDOT) noted a google hangout invitation can be included.
- Lisa Streisfeld (CDOT) noted that the auditorium has been reserved all day for dates reserved. We also need to identify a chair for each sub-committee.

### Literature Review – Erika Miller, PhD from Colorado State University (CSU)

A literature review of key data related to SB 19-239 was conducted and major findings were presented to the Working Group at this first meeting. See **Appendix D: Literature Review Preliminary Findings** for more details on the information presented at the meeting.

Erika provided a summary of the key data outlined in SB 19-239 as follows:

#### *Potential impacts of new and emerging technologies and business models on transportation system*

- How other states, transportation agencies or transit agencies have addressed **congestion model pricing**, with a focus on transportation network companies
- Generate **sufficient revenue** for the state and local governments to mitigate specified impacts
- **Adoption of zero-emissions** vehicles for utilization as motor vehicles used for commercial purposes
- Incentivize **multiple passenger ride sharing** (commercial, first/last mile for public transit)

## Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

### Meeting # 1 June 28, 2019

CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium

- Vehicle **automation adoption rates**

Colorado's EV market share nationally is 2.61% and is ranked 5<sup>th</sup> most by states.

Erika presented TNC Growth Rate information and data as follows:

- For every 100 miles carrying passengers, TNC drivers travel an **additional 69 miles without a passenger** (conservatively)
  - TNCs **add 2.6 new vehicle miles** for each mile of personal driving removed
- Drivers **willing to pay more for TNC** to avoid stress and cost of parking
- *US Trends:*
  - TNCs transported 2.61 billion passengers in 2017 (up from 1.90 in 2016)
  - Average net **reduction in transit** 6% and 3% in light rail
  - 49-61% of ride-hailing trips would have been walking, biking, public transportation, or not taken at all
  - TNC/taxi trips projected to surpass bus ridership by end of year
- *Colorado Trends:*
  - [Denver]: Estimated 185% increase VMT due to TNC usage
  - [Denver]: **34% would have walked, biked or used public transit**
  - [Denver]: **12% would not have made trip at all**

A slide coverage AV technology Adoption included the following information:

- 2045: **24.8% level 4 AV penetration** for private light-duty vehicle fleet
- *Vehicle Manufacturers:* Self-driving on highway by 2021, **2025 for urban driving**
- *Uber Goal:* 75,000 autonomous vehicles on road this year; driverless taxi services in 13 cities by 2022, **forgo human safety drivers by 2020**
- *Other noteworthy emerging technology:*
  - Dominos teaming with Nuro to have driverless pizza delivery (in Texas this year)
  - Postmates (in Los Angeles within a year)

## Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

### Meeting # 1 June 28, 2019

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- Other information regarding EV Incentivization, Voluntary US RUC Programs, Success of International Congestion Pricing and correlating VMT declines, and TNC Taxes imposed per trip for various U.S. Cities. See **Appendix D – Literature Review Preliminary Findings** for more details.

### Literature Review Comments and Discussion

- Sophie Shulman (CDOT) assured the Stakeholder Working Group members that this is just the beginning of bring data and information to the group. Erika Miller was thanked and recognized for her work on the Literature Review.
- Kate Williams (DRMAC) asked if a road user charge (RUC) was levied would TNCs have to pay a per-ride charge in addition to the RUC? Sophie Shulman (CDOT) responded that this would be an excellent question for the Fee Structure Sub-Committee to answer.
- Jake Swanton (Lyft) asked how we are collecting the data, and how will it fit into larger conversations and how do we determine a source to agree upon.
- Sophie Shulman (CDOT) responded that adding something to the protocols about this would be recommended.
- Steve Douglas (Auto Alliance) There is data on the CO<sub>2</sub> emitted per passenger mile that may be useful.
- David Spector (KPMG) observed that there will be a lot of people working on the sub-committees, there may be times when they can't reach consensus. He asked if shared recommendations would be anticipated or something else mutually exclusive like that.
- Jonathan Bartsch explained that the intent is to come to consensus – in the protocols document there are strategies outlined to address this issue, but in some instances we may not have full agreement. Refer to the Operating Protocols document for more details, and feel free to provide comments.

### Public Comments

- Comments from interested parties who were participating remotely
  - Anita Seitz (Westminster Mayor Pro Tem) on the telephone expressed interest in participating on Sub-Committee 1; all groups should look through the lens of sustainability and meeting current and future infrastructure demand.
- Jonathan Bartsch solicited comments from the members of the public in attendance.
  - Julie George of Live Well Colorado noted that the best non-emissions solutions are bicycling and walking and these modes need infrastructure.
  - Another member of the public concurred with Julie George's comment regarding the need for walking and biking infrastructure and asked where these mode users (people) will go.
  - Ben who works with Representative Hansen on TNC policy noted that TNCs need to be more willing to share data. A student did his own research as no data was publically available. TNCs should be more transparent.
  - Representative from National Care Sharing entity commented that we need to be careful not to invest in stranded assets – be cautious of too much investment in technology before other types of technology and modes get ahead of us.

## **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

### **Meeting # 1 June 28, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

### **Next Steps and Final Comments**

- Sophie Shulman (CDOT) announced that the next meeting is tentatively scheduled, but we will confirm early next week.
- Jeff Cleland (Amazon) In terms of package delivery, we need more focus on this for and prescription delivery too, focus not just on TNC and ride sharing.
- Kate Williams (DRMAC) Need to consider an equity model and impacts, as older adults and disabled people are impacted by this, we also need to consider this when planning.
- Lou Davenport (Iron Stride Solutions) also need to understand how to distinguish personal from commercial vehicles.







# 2019 Emerging Mobility Impact Study

## Stakeholder Working Group Meeting # 1

June 28, 2019  
9:00AM to 12:00PM

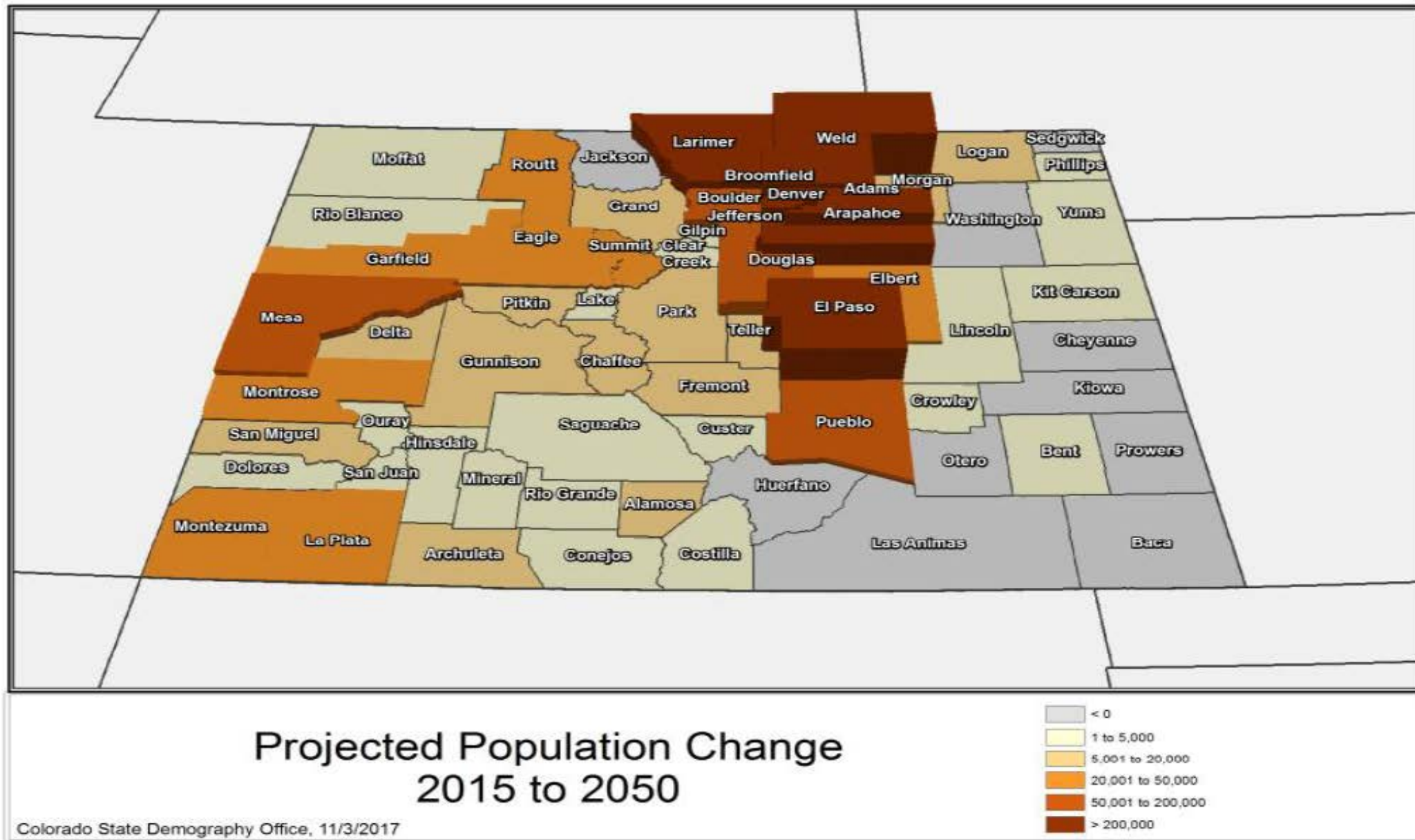
CDOT Auditorium  
2829 West Howard Place, Denver, CO 80204



## Agenda

ITEM	TOPIC	LEAD	TIME
1	Introductions	Facilitator	9:00-9:10
2	Purpose and Content of Senate Bill 19-239	Director Lew/Director Toor/Elected Officials	9:10-9:40
3	Participants Goals	Facilitator	9:40-10:15
4	Operating Protocols	Facilitator/Lisa Streisfeld	10:15-10:45
5	Activity: Sub-committee Formation	Facilitator	10:45-11:30
6	Literature Review (early findings/status)	Colorado State University	11:30-11:40
7	Public Comment Period	Facilitator	11:40-11:50
8	Wrap Up & Action Items	Facilitator	11:50-12:00

# Our infrastructure will not be able to keep up with population growth





## The impact of congestion

**According to Texas Transportation Institute's 2018 study\* for the top 100 most congested corridors in Colorado:**

**Total Delay:** 85.5 million hours/year

**Total Wasted Fuel:** 27.8 millions of gallons/year

**Total Hours of Truck Delay:** 3.16 million hours/year

**Total Truck Congestion Cost:** \$160 million/year

*The congestion cost of this wasted fuel & delay totals \$1.614 billion!*

For context, CDOT's annual budget (not including the Enterprises) for FY 2019-20 is: \$1.96 Billion

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## ***Executive Order B 2019 002: Supporting a Transition to Zero Emission Vehicles***

“Transportation is a major contributor to air pollution and one of the two primary sources of ozone precursors, which combine under the influence of sunlight to create harmful ozone pollution, contributing to continuing violations of health-based federal pollution standards in much of the Front Range.....”



## What problems are we trying to address?

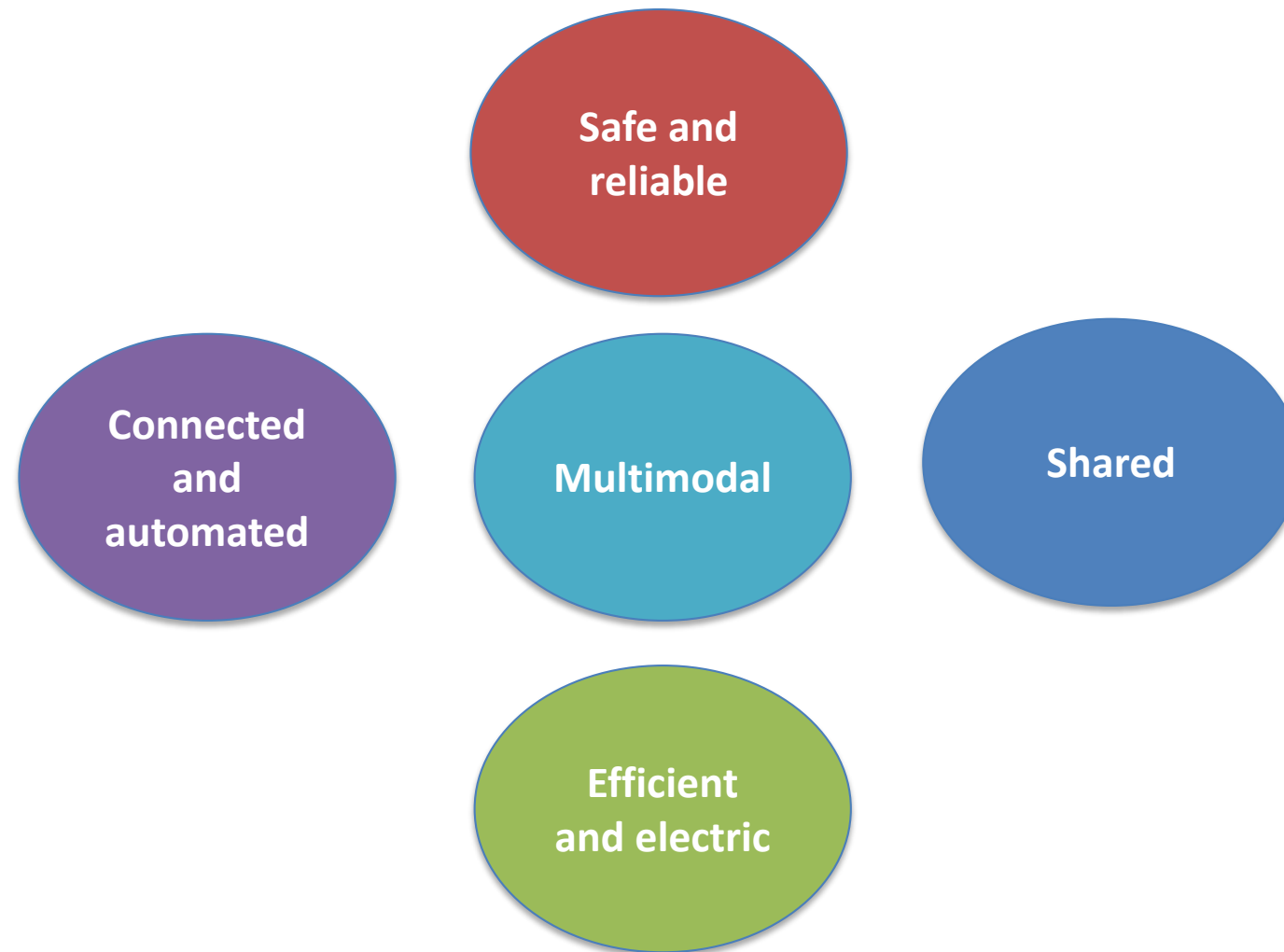
### Traffic Congestion

- Increase number of passengers per vehicle
- Decrease number of cars on the road
- Manage demand

### Air Quality and Climate Change

- Reduce emissions
- Change ICE to EV
- Fund and construct EV charging infrastructure

## What is the future of transportation?



*“Our urban and suburban spaces could become a heaven or a hell in the near future depending on the way we choose to let new services and technology. We are seeing the rise of technology as an asset and we are also seeing that the value of a car-dominant city has reached its zenith...The city regulatory and physical infrastructure has been built on a personal car-dominant infrastructure.”*

*- Robin Chase*

## **S.B. 19-239: Address Impacts Of Transportation Changes**

Concerning means of addressing the impacts of technological and business model changes related to commercial vehicles, and, in connection therewith, requiring the department of transportation to convene and consult with a stakeholder group to examine impacts of new transportation technologies and business models, identify means of addressing impacts, and report findings and make recommendations to the general assembly.

- Elected Officials
- Stakeholder Working Group Members
- Colorado Department of Transportation
- Colorado Energy Office
- Facilitator
- Colorado State University
- Interested Parties
- Members of the Public



## ***Definition of a motor vehicle used for commercial purposes from S.B. 19-239***

"Motor vehicle used for commercial purposes" means a motor vehicle that is used to provide passenger transportation services purchased through a transportation network company, as defined in section 40-10.1-602 (3), a peer-to-peer car sharing company, a car sharing company that does not use a peer-to-peer business model, or a company that provides taxicab service as defined in section 40-10.1-101 (19), a motor vehicle that is rented out by a rental car company, and a motor vehicle that is used for residential delivery of goods.

## ***Definition of a motor vehicle used for commercial purposes from S.B. 19-239***

“Motor vehicle used for commercial purposes”  
does not include:

- I. A motor vehicle used to deliver goods that is used only to deliver goods
  - A. To addresses other than residences; or
  - B. That are delivered as freight;
- II. A motor vehicle that has a gross vehicle weight rating of more than fourteen thousand pounds; or
- III. A motor vehicle that is operated for the purpose of transporting passengers:
  - A. Under a contract with the Regional Transportation District (RTD) created in Section 32-9-105, a Regional Transportation Authority created pursuant to Park 6 of Article 4 of this Title 43, or any other governmental or public entity; or
  - B. By a common carrier, as defined in Section 40-1-102(3), except as otherwise provided in Subsection (3)(a) of this section.

## ***2019 Emerging Technology Impact Study and S.B. 19-239 – Key Tasks***

Forms a Stakeholder Working Group which will:

1. Examine the economic, environmental, and transportation system impacts of the adoption of new and emerging technologies and transportation business models;
2. Receive information and recommendations from the Freight Advisory Council regarding current and evolving practices related to the residential delivery of goods;
3. Quantify the amount of carbon emissions that can be eliminated through different means of incentivizing and supporting the use of ZEV (zero emission vehicles) motor vehicles used for commercial purposes;
4. Examine the requirement for TNCs to provide proof of medical fitness; and
5. Assess implementation costs of proposed changes.

## ***2019 Emerging Technology Impact Study and S.B. 19-239 – Key Tasks***

The final recommendations must:

1. Include a means of addressing the impacts that increase positive impacts and mitigate negative impacts;
2. Determine whether fees should be levied upon the use of motor vehicles used for commercial purposes

The Fees shall:

- Mitigate the impacts to the transportation system resulting from the increasing use of motor vehicles used for commercial purposes;
  - Fund infrastructure, (for multi modal and to support the adoption of ZEVs);
  - Defray costs of fee collection;
  - Incentivize adoption of ZEVs for commercial purposes; and
  - Incentivize multiple passenger ride sharing for commercial vehicles used for commercial purposes and the use of such vehicles as a first and last mile solution for public transit users
3. Authorize CDOT to promulgate rules that implement stakeholder working group and Legislative recommendations.
  4. Develop an implementation strategy:
    - How fees should be calculated and imposed, including but not limited to:
      - flat or variable
      - per trip/mileage bases or a combo of such
      - different rates on different classes of vehicles
      - different rates at different locations, time of day or based on real time analysis
      - waive or reduce for those vehicles used for first and last mile solution for public transit
      - cap at one of more maximum amount
    - What schedule, stages and rates should the fees should be imposed?

# 2019 Emerging Mobility Impact Study Schedule

CDOT & CEO Complete  
SB 19-239 Study

November 1, 2019 Stakeholder Report  
Out

January 15, 2020 SMART Hearing

2020 Legislative Session (determines  
what new laws are passed with regards  
to Study recommendations)

October 1, 2020

CDOT Deadline for Promulgating Rules

CDOT Office of Policy and Government  
Assists with Rule-Making Process (allow  
6 months)

Freight Advisory Council Process

## Stakeholder Working Group Meetings and Key Tasks

### Stakeholder Working Group Meeting 1

Friday, June 28, 2019

- Introductions
- Review purpose of 2019 Emerging Mobility Impact Study
- Form Sub-Committees

### Stakeholder Working Group Meeting 2

July/August TBD

- Define purpose of incentives and disincentives
- Create evaluation criteria to analyze options
- Develop options for fee structure
- Assign questions to answer and tasks to complete for Sub-Committees

### Stakeholder Working Group Meeting 3

September TBD

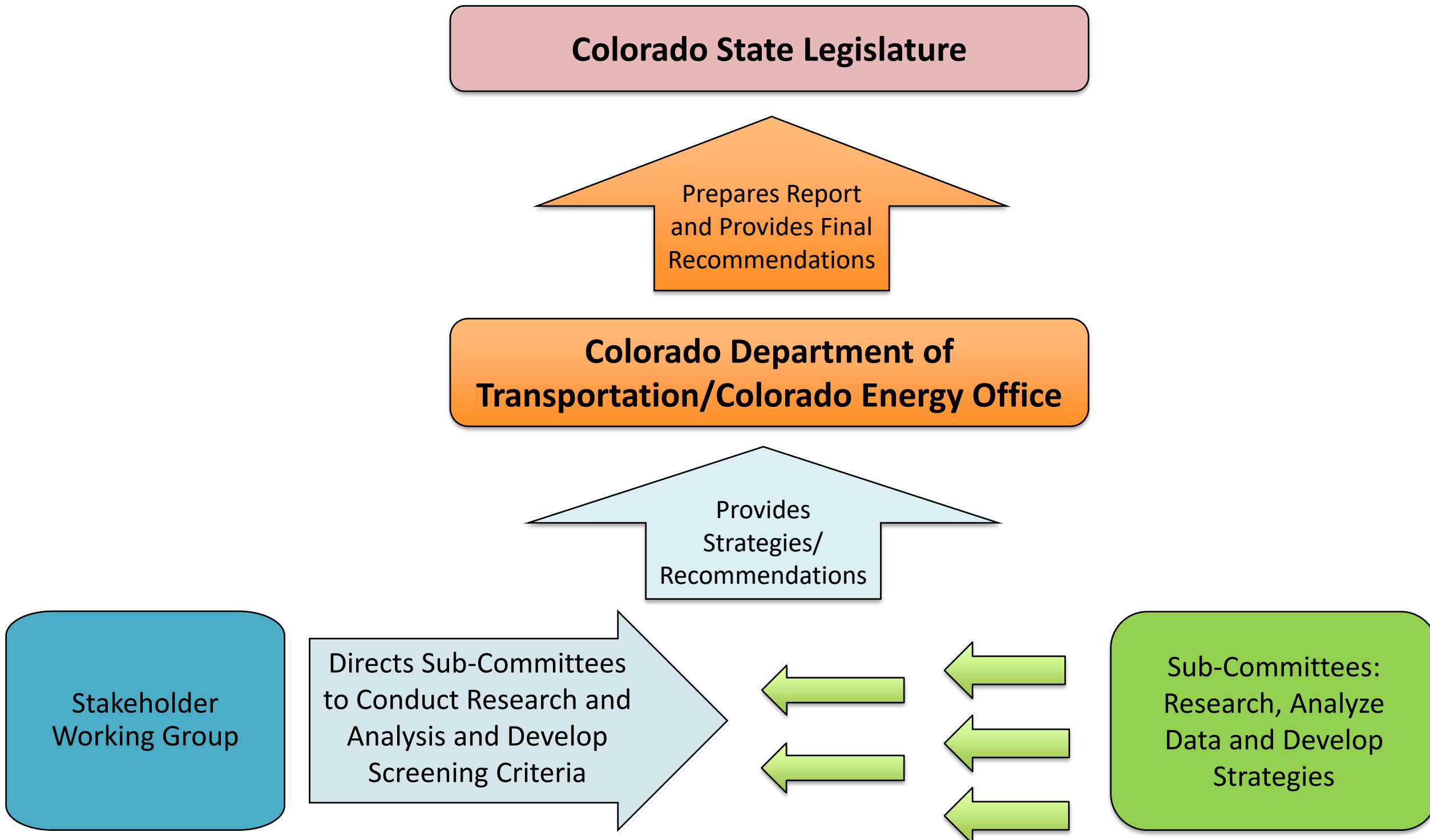
- Review data and findings from Sub-Committees
- Review the findings from the Sub-committees
- Review and rank the options according the criteria
- Using the priorities, create draft recommendations

### Stakeholder Working Group Meeting 4

October TBD

- Review draft report, recommendations and make any edits
- Define how any revenue generated will be used
- Define the type of capital improvements to be funded
- Discuss ways to implement within the agencies impacted

## Stakeholder Working Group and Relationship to Sub-Committees



## Description of Sub-Committees

### *Discussion of Key Issues, Challenges, Opportunities and Data Needs*

**Sustainability: Incentivizing Vehicle Electrification**

**Natural Environment Impact and Emissions Assessment**

**Congestion Management: Incentivize Shared Ridership**

**Fee Structure for Commercial Transportation Vehicles  
and Transportation Network Companies**

**Social Impact and Equity Analysis**

**What else are we missing?**



## CDOT's Auditorium for Sub-Committee Meetings

Reserved Dates for West Auditorium from 8:00am to 4:00pm

Monday, July 8

Monday, July 15

Monday, August 5

Friday, August 9

Friday, September 6

Monday, September 16

Monday, October 7

Friday, October 11

## Literature Review by Colorado State University

Lead Investigator is Dr. Erika Miller, Assistant Professor of Systems Engineering and Mechanical Engineering, Colorado State University: [Erika.Miller@colostate.edu](mailto:Erika.Miller@colostate.edu)

(970) 491-3346

### Questions to answer:

- ☐ What are the growth rates for electric vehicle adoption?
- ☐ What are the strategies to promote shared ridership in format of carpools, vanpools, taxis, and shared TNC trips?
- ☐ What are the growth rates for transportation network companies nationally and in Colorado?
- ☐ How will TNCs impact congestion in Colorado?
- ☐ How will TNCs impact air quality in Colorado?
- ☐ What are the key adoption strategies to incorporate ZEV to decrease impact of climate change?
- ☐ What data is available from commercial vehicles?
  - ☐ How many trips per vehicle?
  - ☐ What is the average trip length in distance?
  - ☐ What is average length in time?
  - ☐ Occupancy per trip



## Stakeholder Working Group Action Items

1. Check out the project website:

<https://www.cdott.gov/library/studies/emerging-mobility-impact-study>

2. Review reference documents

3. Select sub-committees and notify Lily Lizarraga which one you would like to participate:

[Lily.Lizarraga@state.co.us](mailto:Lily.Lizarraga@state.co.us)

4. Block out future Stakeholder Working Group meetings on your calendar



**Thank You!**



## **Appendix D - Literature Review Preliminary Findings**

# Literature Review for SB-19-239

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Erika Miller, PhD

Somayeh Aliebrahimi, Graduate Student  
Systems Engineering & Mechanical Engineering  
Colorado State University



**COLORADO**  
Department of  
Transportation

June 28, 2019

**Colorado State  
University**





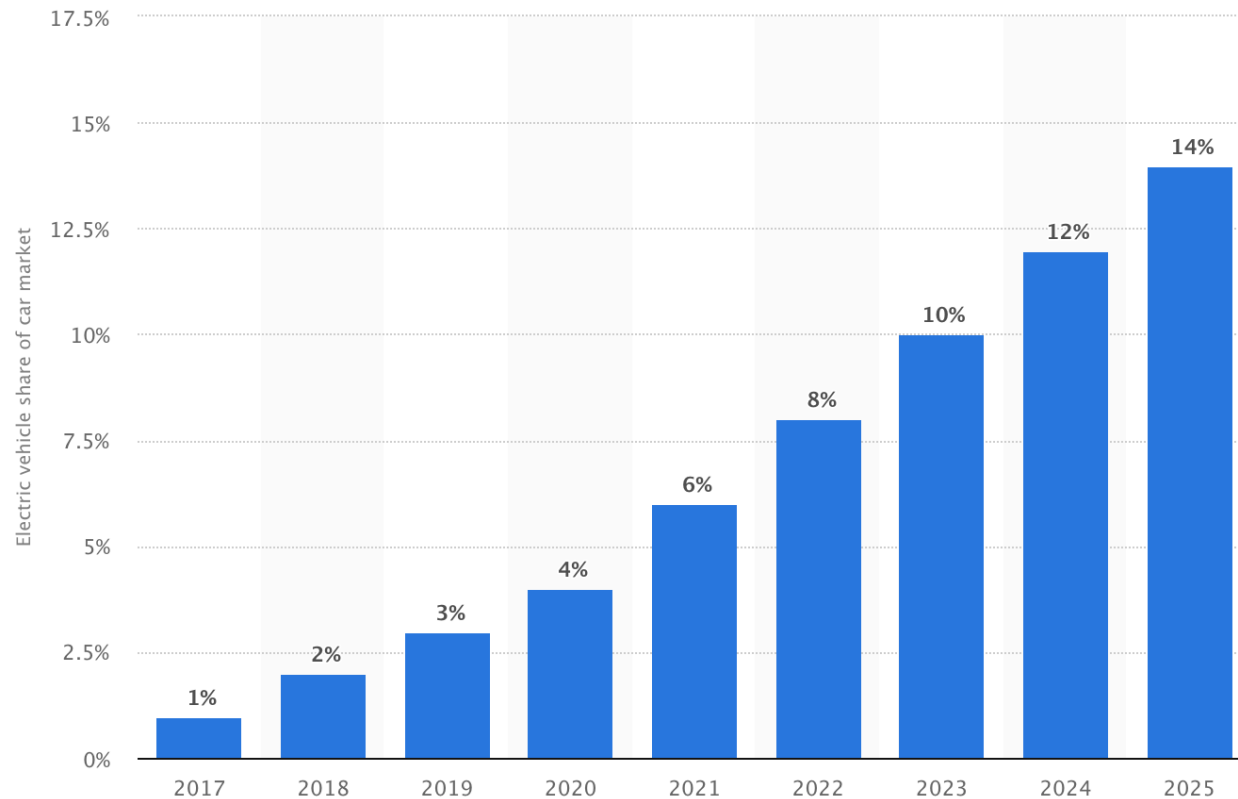
# Overview

*Potential impacts of new and emerging technologies and business models on transportation system*

- How other states, transportation agencies or transit agencies have addressed **congestion model pricing**, with a focus on transportation network companies
- Generate **sufficient revenue** for the state and local governments to mitigate specified impacts
- **Adoption of zero-emissions** vehicles for utilization as motor vehicles used for commercial purposes
- Incentivize **multiple passenger ride sharing** (commercial, first/last mile for public transit)
- Vehicle **automation adoption rates**

# Electric Vehicle Adoption Rates

- Colorado EV market share
  - 2018: **2.61%** (up from 1.57% in 2017), ranked 5<sup>th</sup> most by states <sup>1</sup>



*Projected US  
EV Market  
Share <sup>2</sup>*

<sup>1</sup> <https://evadoption.com/ev-market-share/ev-market-share-state/>

<sup>2</sup> <https://www.statista.com/statistics/744946/us-electric-vehicle-market-growth/>



3 <https://www.sciencedaily.com/releases/2018/09/180927122934.htm>  
4 <http://www.schallerconsult.com/rideservices/automobility.htm>  
5 [http://www.reginaclewlow.com/pubs/2017\\_UCD-ITS-RR-17-07.pdf](http://www.reginaclewlow.com/pubs/2017_UCD-ITS-RR-17-07.pdf)  
6 [http://digital.auraria.edu/content/AA/00/00/60/55/00001/Henao\\_ucd\\_enver\\_0765D\\_10823.pdf](http://digital.auraria.edu/content/AA/00/00/60/55/00001/Henao_ucd_enver_0765D_10823.pdf)  
7 <https://link.springer.com/article/10.1007%2Fs11116-018-9923-2>

# TNC Growth Rates

- For every 100 miles carrying passengers, TNC drivers travel an **additional 69 miles without a passenger** (conservatively) <sup>3</sup>
  - TNCs **add 2.6 new vehicle miles** for each mile of personal driving removed <sup>4</sup>
- Drivers **willing to pay more for TNC** to avoid stress and cost of parking
- *US Trends:*
  - TNCs transported 2.61 billion passengers in 2017 (up from 1.90 in 2016) <sup>4</sup>
  - Average net **reduction in transit** 6% and 3% in light rail <sup>5</sup>
  - 49-61% of ride-hailing trips would have been walking, biking, public transportation, or not taken at all <sup>5</sup>
  - TNC/taxi trips projected to surpass bus ridership by end of year <sup>4</sup>
- *Colorado Trends:*
  - [Denver]: Estimated 185% increase VMT due to TNC usage <sup>6</sup>
  - [Denver]: **34% would have walked, biked or used public transit** <sup>7</sup>
  - [Denver]: **12% would not have made trip at all** <sup>7</sup>

# Automated Technology Adoption

- 2045: **24.8% level 4 AV penetration** for private light-duty vehicle fleet <sup>8</sup>
- *Vehicle Manufacturers*: Self-driving on highway by 2021, **2025 for urban driving** <sup>9</sup>
- *Uber Goal*: 75,000 autonomous vehicles on road this year; driverless taxi services in 13 cities by 2022, **forgo human safety drivers by 2020** <sup>10</sup>
- *Other noteworthy emerging technology*:
  - Dominos teaming with Nuro to have driverless pizza delivery (in Texas this year) <sup>11</sup>
  - Postmates (in LA within year) <sup>12</sup>

8 <https://trid.trb.org/view/1392676>

9 <https://emerj.com/ai-adoption-timelines/self-driving-car-timeline-themselves-top-11-automakers/>

10 <https://techcrunch.com/2019/03/12/ubers-self-driving-car-unit-was-burning-20-million-a-month/>

11 <https://www.forbes.com/sites/greggandner/2019/06/17/dominos-nuro-team-up-for-driverless-pizza-delivery-in-houston/#55d06e76e6b5>

12 <https://www.forbes.com/sites/lanabandoim/2018/12/21/postmates-reveals-its-autonomous-delivery-rover-called-serve/#617bb33374a9>



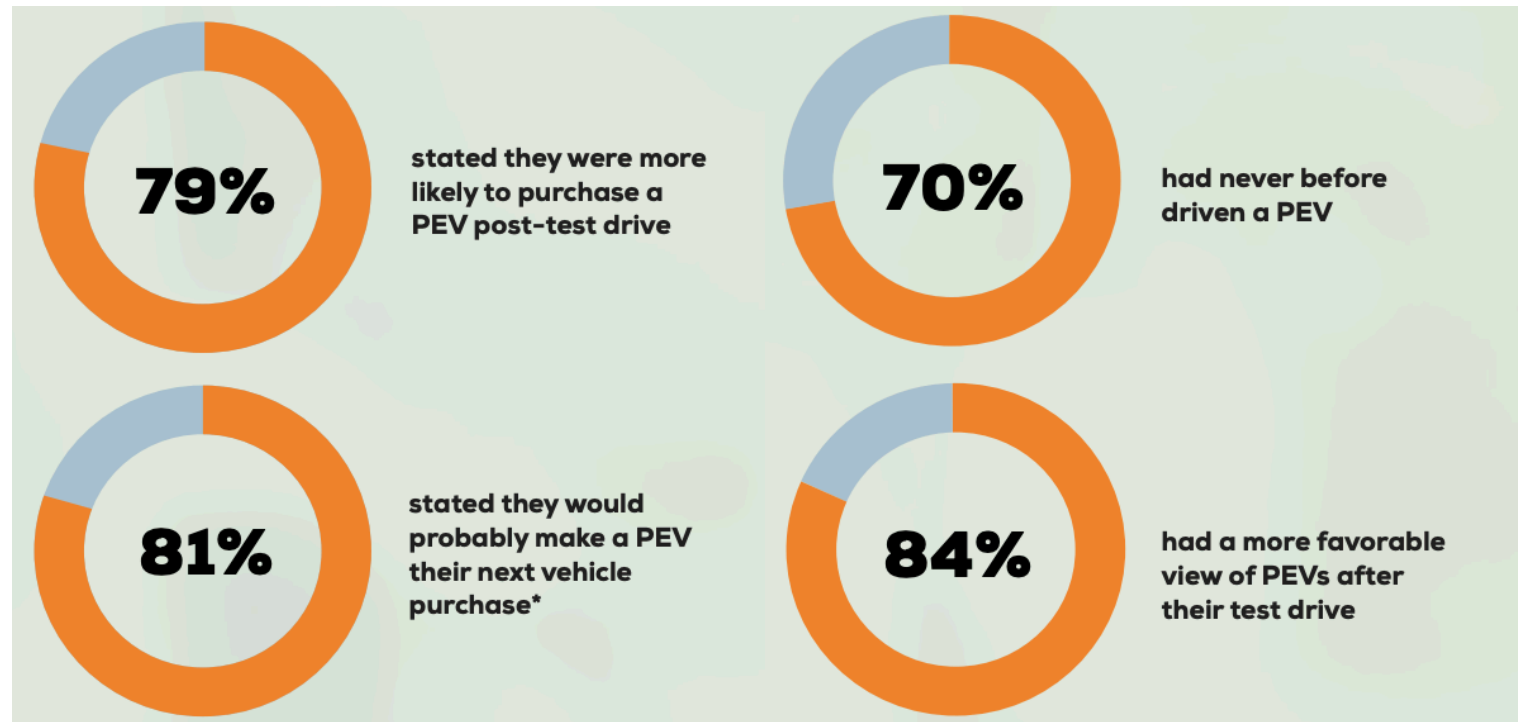
# EV Incentivization

<sup>13</sup> <https://content.govdelivery.com/accounts/ORDOT/bulletins/24c7950>

<sup>14</sup> <https://www.nescaum.org/documents/2018-zev-action-plan.pdf>

- Tiered vehicle registration fees based on MPG <sup>13</sup>
- **Public Outreach**
  - 75% consumers know little or nothing at all about electric vehicles <sup>14</sup>
  - **Availability of charging is of top concern** <sup>14</sup>

*2017  
Massachusetts  
State-Sponsored  
Ride and Drive  
Campaign*



# [Voluntary] US RUC Programs

- *Impact*: 5 million EVs would lead to **\$500 million decrease** in infrastructure funding annually <sup>15</sup>
- VMT up, but gas tax revenue down
  - CDOT has a **\$1 billion-a-year budgetary shortfall** over the next 10 years <sup>16</sup>
- Most RUC fees around **1.5 cents per mile** (Federal 18.4 cents per gallon gas plus more per state, CO 22 cents per gallon) <sup>17, 18, 19, 20</sup>
- California Pilot 2016 (N = 5000) <sup>18</sup>
  - **85% overall satisfaction, 4% attrition**
  - 73% felt RUC was more equitable than gas tax
- Colorado Pilot 2016 (N = 150) <sup>19</sup>
  - 81% felt RUC was fair way of funding
  - **90% thought mileage collection was fair and easy**

<sup>15</sup>

<https://escholarship.org/content/qt62f72449/qt62f72449.pdf?t=pkz4i0>

<sup>16</sup> <https://www.codot.gov/library/AnnualReports/cdot-official-annual-reports/2017-annual-report>

<sup>17</sup> [https://www.oregon.gov/ODOT/Programs/RUF/IP-Road%20Usage%20Evaluation%20Book%20WEB\\_4-26.pdf](https://www.oregon.gov/ODOT/Programs/RUF/IP-Road%20Usage%20Evaluation%20Book%20WEB_4-26.pdf)

<sup>18</sup> <https://dot.ca.gov/-/media/dot-media/programs/road-charge/documents/final.pdf>

<sup>19</sup>

<https://www.codot.gov/programs/ruc/programs/ruc/documents/rucpp-final-report>

<sup>20</sup> <https://taxfoundation.org/state-gas-tax-rates-july-2018/>

# Success of International Programs

- *London Congestion Pricing* <sup>21</sup>
  - 30% reduction of traffic congestion
  - Gross revenue USD \$3.9 billion (USD \$130 million annual operating costs)
  - **16% decline in CO<sub>2</sub>, 13.5% decline in NO<sub>x</sub>, and 15.5% decline in particulate matter**
- *Stockholm Congestion Pricing* <sup>22</sup>
  - **14% reduction in CO<sub>2</sub>, 7% in NO<sub>x</sub>, 9% in particulate matter, and 2.5% reduction in GHG outside of cordon**
  - VMT decreased by 14% within cordon and by 1% outside cordon
- Similar findings in Milan and Singapore <sup>22, 23</sup>

<sup>21</sup> <https://scholar.utc.edu/cgi/viewcontent.cgi?article=1060&context=honors-theses>

<sup>22</sup> [http://nyc.streetsblog.org/wp-content/uploads/2018/01/TSTC\\_A\\_Way\\_Foward\\_CPreport\\_1.4.18\\_medium.pdf](http://nyc.streetsblog.org/wp-content/uploads/2018/01/TSTC_A_Way_Foward_CPreport_1.4.18_medium.pdf)

<sup>23</sup> [https://www.researchgate.net/publication/325987968\\_The\\_Ecopass\\_pollution\\_charge\\_and\\_Area\\_C\\_congestion\\_charge\\_-\\_comparing\\_experiences\\_with\\_cordon\\_pricing\\_over\\_time](https://www.researchgate.net/publication/325987968_The_Ecopass_pollution_charge_and_Area_C_congestion_charge_-_comparing_experiences_with_cordon_pricing_over_time)

# TNC Taxes

- Currently, several major cities and states have some type of TNC fee or tax, including some of the following examples: <sup>24, 25</sup>
  - Chicago (72 cents **per trip**)
  - New Orleans and Portland (50 cents **per trip**)
  - King County (33 cents **per trip**)
  - Massachusetts (20 cents **per trip**)
  - NYC (2.75 **per trip**, 75 cents **if pooled**)
  - New York (4% **of total fare** on trips originating outside of NYC)
  - Philadelphia (1.4% **of total fare**)
  - Nevada (3% **of total fare**)
  - California (0.33% of total **TNC revenue**)

<sup>24</sup> <https://www.enotrans.org/etl-material/eno-brief-taxing-new-mobility-services-whats-right-whats-next/>

<sup>25</sup> <https://www.documentcloud.org/documents/5777494-36154-Appeal-Redacted.html>



A stylized, geometric illustration of a mountain landscape. In the foreground, a grey road with white dashed lines leads towards the mountains. A small evergreen tree stands on the right side of the road. In the background, several mountain peaks are depicted with dark grey bodies and white, snow-capped tops. A single white cloud floats in the light grey sky. A small blue circle is positioned on the right edge of the illustration, near the base of the mountains.

# Thank you!

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COLORADO  
Department of  
Transportation

Colorado State  
University







APPENDIX B

WORKING GROUP MEMBERSHIP AND MATERIALS

**SWG Meeting 2 Notes  
and Presentation  
August 19, 2019**



# Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

## Meeting # 2 August 19, 2019

CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium

### Stakeholder Working Group Member Attendance:

Bruce Abel	Pete Kirchhof	Michelle Scheuerman
Jenny Adler	Shoshana Lew	Jep Seman
Jonathan Bartsch	Lily Lizarraga	Sophie Shulman
Kaylyn Bopp	Simon Long	Melanie Sloan
Brian Cheshar	Sydney Lund	Scott Spendlove
Jeff Cleland	Erika Miller	Celeste Stragand
Kathleen Collins	Jim Moody	Lisa Streisfeld
Nicole Dalmy	Manolo Morales	Will Toor
Krista Flynt	Ashley Nylan	Rose Waldman
Kjersten Forseth	Piper Overstreet-White	Robert Williams
Erin Goff	Christopher Primus	Meegan Wood-Trombley
RJ Harrington	Totsy Rees	
Lauren Isaac	Magath “Max” Sarr	

\*Attendance was not taken for those who attended via teleconference.

### Project Management

#### Welcome and Introductions

Shoshana Lew, CDOT Executive Director, kicked-off the meeting. Executive Director Lew expressed her gratitude to all the participants in this process who helped by giving their time and dedication to this effort. Thank you and recognitions were extended to: CDOT staff, partner agencies, working group stakeholders. Elected Officials in attendance were recognized.

Executive Director Lew also expressed her thanks to and recognized the sponsors of the SB 19-239 legislation who were not present: Senators Winter, Bridges, Moreno and Priola, along with Representatives Gray, Bird, Buentello, Cutter, Duran, Hooton, Michaelson, and Valdez.

Representative Hansen was thanked and recognized for attending in-person.

The purpose and intent of SB 19-239 is to mitigate impacts of commercial vehicles. Reducing greenhouse gas emissions is important, and it is exciting to have the new legislation to promote Zero Emission Vehicles adopted. These different policies are coming together and there are great opportunities associated with these converging policies. It will be exciting to hear the report outs from the subcommittees formed at the last Working Group meeting.

Will Toor, Director of the Colorado Energy Office, also expressed gratitude to folks devoting time and energy to this important work and noted this is an exciting opportunity to work together.

Jonathan Bartsch of CDR, meeting facilitator, overviewed the meeting agenda topics and discussion, which included:

- Adoption of Meeting #1 Notes

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting # 2 August 19, 2019**

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- Adoption of Operating Protocols
- Introduction of the Consultant Team
- Update of the schedule and key milestones
- The Public Utilities Commission (PUC) did a comparison of Colorado requirements for Taxis and Transportation Network Companies (TNCs - e.g., Uber and Lyft)
- Lots of information from the Subcommittees and will provide a high level sense of where they are and how the working group can provide direction.
- Break (10 minutes)
- Criteria for a fee structure
- Literature Review Report Out
- Next Steps – Future meeting times

### **Adoption of Meeting Notes from June 28, 2019**

Adopt the notes from the first working group meeting held on June 28<sup>th</sup>. Jonathan asked if anyone had any comments, asked members to review the notes, and noted that they can be modified if necessary. The working group members raised no comments and adopted the notes.

### **Adoption of Operating Protocols**

Jonathan Bartsch explained that in terms of the operating protocols, two items have been revised:

- Process for making recommendations
- Freight Advisory Council (FAC) Roles

Stakeholder Working Group (SWG) members were asked to comment on the revisions. No comments were raised. Protocols were adopted with revisions incorporated as is.

### **Introduction of Consultant Team**

Sophie Shulman, CDOT Director of the Office of Innovative Mobility, introduced the project team and recognized CDOT support staff for their contributions. Project Team Lead entities include:

- CDOT
- Colorado Energy Office
- Colorado State University
- CDR and Associates
- HDR
- Cambridge Systematics
- S-Curve Strategies

### **Project Schedule and Key Milestones**

Sophie provided an overview of what to expect over the next few months in terms of the project schedule.

- Stakeholder Working Group Meeting #1 – June 28, 2019
- Stakeholder Working Group Meeting #2 – August 19, 2019
- Stakeholder Working Group Meeting #3 – September 26, 2019

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- Stakeholder Working Group Meeting #4 – October 24, 2019
- Recommendations and Emerging Mobility Impact Study Report due November 1, 2019
- Smart Legislative Hearing - January 15, 2020

In addition, Sophie Shulman provided an overview of providers covered under SB 19-239. The list included:

•

Provider	Definition	Examples
Transportation Network Company	A company that relies upon a mobile application to pair drivers with riders, as defined in Section 40-10.1-602 (3).	Uber, Lyft, Hop Skip Drive
Peer Car Share	A car sharing company that enables individuals to rent personal vehicles to others	Turo, Drift, Getaround, Maven
Car Clubs: Non-Peer Car Share	A car sharing company that operates a fleet of vehicles for use by individuals	Streetcar, ZipCar, Car2Go/Share Now, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz
Taxi	A company that provides taxicab service, as defined in Section 40-10.1-101 (19)	Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative
Car Rental	A company that rents vehicles to individuals	Enterprise, Avis, Hertz, Budget
Residential Delivery Services	A company that delivers goods to residential addresses with a vehicle having a gross vehicle weight rating under 14,000 lbs	Uber Eats, Door Dash, UPS, Fed Ex, King Soopers residential, Amazon Delivery Service Partner, AmazonFlex

No comments were raised by the SWG members regarding the list of SB 19-239 providers or project key milestones.

## Data and Findings

### Comparison of requirements for Taxis vs. TNCs

# Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

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	Regulating Agency	Company Requirements	Driver Requirements	Vehicle Requirements	Fare	Fees
TNC-Transportation Network Company	Public Utilities Commission under Colorado Department of Regulatory Agencies	TNC Insurance Alcohol Policy Review Driver History annually, Criminal History Check and National Sex Offender Database of Driver Limits on who can be a driver based upon convictions; Maintain 1-yr logged data for license, driver ID, date, time location (long/lat) for pick up and drop off	Valid Driver's License Primary Driver Liability Insurance of \$1M Health Certificate -driver is medically fit to drive Limit 12 hours of consecutive driving, must be 21 years old cannot log in after 16 cumulative hours; can log in more than 70 hours in 7 day period; drivers are independent contractors	Automobile Insurance Proof of Colorado Vehicle Registration Vehicle Safety inspection annually Referral ADA rider to another service with appropriate equipment	Pre published prices; surge pricing permitted	TNC has annual permit with PUC
Taxi	Public Utilities Commission under Colorado Department of Regulatory Agencies; US Department of Transportation	One year of logged data with Cab number, name, trip date time pick up and destination address; multi-load in Must provide 24 hour a day service in certain densities. Certificate of Public Convenience and Necessity Contract Carrier Permit Exempt Passenger Carrier Registration	Background check; health certificate; taxi are independent contractors	Taxi license plate Cab number inside vehicle Not allowed to multi-load without permission; minimum number of operating vehicles in several counties	Some flat rates, Fares governed by zones A-D with max rates to DIA, complicated multi-loading & drop fees; max rates in certain counties; limits on delay due to traffic	Annual vehicle identification fee.

Brian Chesher, of the Public Utilities Commission (PUC) provided a presentation highlighting the distinctions between taxis and Transportation Network Companies (e.g., Uber and Lyft).

- The PUC regulates intrastate motor carrier transportation.
- Taxis include shuttles, common carriers, contract carriers and limousines. Oversight is related to ensuring taxis operate in a safe environment. Requirements include driver background checks.
- TNCs, such as Uber and Lyft, are also regulated by the PUC with driver requirements regarding safety, vehicle condition, etc.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

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- Max Sarr, of Freedom Cabs, noted another distinction is related to hours of service and mentioned a petition that is being distributed for signatures regarding this issue. The petition conversation was deemed to be a subject for a subcommittee meeting, and not a full SWG meeting.
- Last year PUC sold 7,500 stamps (permits) for vehicles. Of those 7,500 permits, 5,200 of those were sold to taxis, limos, and children's activities busses.
- It was noted that paratransit services fall under the common carrier, taxi, or shuttle service.

Next, Evan Enarson-Hering of Cambridge Systematics provided a presentation on modeling the travel patterns of TNCs and taxis in general and for the last mile (residential deliveries for freight).

- There are three major types of providers for residential delivery
- Parcel Package Delivery – examples: UPS and FedEx
  - Third parties delivery – e.g. Amazon and Walmart
  - Commercial On-Demand/Independent contractor couriers – e.g. Pizza Hut and Jimmy Johns'
    - In order to be a true independent contractor, that independent contractor is required to have the ability to accept and decline different loads. These workers can not be on the clock. Specific guidance for the requirements of independent contractor can be found on the Department of Labor's guidance page on their website.
- Vehicles that are 2-axle and over 14,000 lbs are not included in SB 19-239 regulations.
- Greg Fulton of the Colorado Motor Carriers Association (CMCA) noted that per the Department of Labor an independent contractor must own their vehicle and not be working "on the clock" for the company. There is specific guidance on the Department of Labor website.
- It was asked where dispatch health, medical, or pharmaceutical vehicles fall. An answer was provided that these vehicles are not covered under this part of the legislature. Other vehicles not covered under this legislature includes mobile dog washing vehicles, mobile tire change vehicles, etc.
- Kate Williams of DRMAC noted medical and pharmaceutical deliveries – the legislation is overlooking this market that will grow.
- Evan Enarson-Hering responded that those are not specifically covered in the SB 19-239 legislation but fall within the intent. Team is working with the Freight Advisory Council on these distinctions and freight industry transportation.
- Sophie Shulman explained that freight is not in the scope. The question to answer is VMT and emissions from the covered service providers.
- David Spector of KPMG asked about where data is being found and level of detail anticipated for data analyses.
- Greg Fulton commented that a consideration also is if a trip is intrastate truly vs interstate activity – regarding the purpose of the trip.
- The Regional Transportation District rep asked if a temporal distribution evaluation is being conducted.
- Evan Enarson-Hering responded that yes, that is being taken into consideration. Hope to have a baseline understanding of real time observed data from PUC and Denver International Airport (DEN) count data. TNC and Taxi data is needed to determine the scope of transportation providers. Delivery information is needed, and NDAs for companies with data sharing limitations is an option. We will

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feed into the CDOT Activity-Based Statewide Travel Model TNC and taxi data, and other policy level data at the macro level. There will be sketch planning for non-model related analysis. We know that outputs are only as good as inputs – therefore the SWG and subcommittees need to know caveats associated with data – footnotes, etc. A plea for data and specific data requests from CDOT and team members to go out to SB 19-239 taxi and TNC providers is forthcoming.

- A SWG member raised the issue of econometrics and of the elasticity in terms of response to fees/tolls and revenue strategies.
- Jake Swanton, of Lyft asked when can he/they can see models – at the next round of subcommittee meetings we should have this information or ASAP.
- For the stakeholder group, it is important for us to know where the data came from and what assumptions are being used when coming up with specific data sets and outcomes. This way, the stakeholders can make the best decision and recommendation possible.
- CDOT will sign a non-disclosure data agreement if anyone in the group is able to share their data to help with this study. The observed data goes into modeling tools that are based on survey counts, patterns, and observed data.
- Jonathan Bartsch of CDR explained that the next portion of the meeting – the subcommittee updates will have time for Q&A after each subcommittee report.

## Subcommittee Research

### Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs: (Matt Frommer, SWEEP)

- Our subcommittee is looking at incentivizing vehicle adoption. We are looking at zero emission vehicles, battery electric vehicles, plug in hybrid electric vehicles, renewable natural gas vehicles, and hydrogen vehicles.
- Our work plan includes:
  - Benefits of ZEVs in the Emerging Commercial Transportation Sector
  - Barriers to ZEVs in the Emerging Commercial Transportation Sector
  - Potential Tools and Strategies to Incentivize ZEVs in the Emerging Commercial Transportation Sector
  - Sub-Committee Recommendations
- The subcommittee has various questions that they are seeking to answer. These questions include:
  - What are the recommended tools and strategies that the State of Colorado should pursue to better incentivize electrification (conversion to ZEVs) in the emerging commercial transportation sector?
  - What are the estimated impacts of these tools and strategies?
  - Can any of these tools and strategies be integrated into a potential fee structure developed by the full SB19-239? If so, how?
  - What data would be necessary for the State of Colorado to develop, gather, and track in order to implement the Sub-Committee's recommendations?



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- In addition to State policy, how can other key stakeholders facilitate the adoption of ZEVs for commercial fleets and what are the recommended tools and strategies to support a system-wide transformation?

### Comments:

- Kate Williams of DRMAC suggested that many of the questions being raised by this process are also being raised by NREL. If they have not participated yet, please encourage them to participate in the next sub committee meeting to obtain data for this effort.

### Natural Environment Impact and Emissions (Travis Madsen, SWEEP)

- Conduct Vehicle Miles Traveled and Carbon Emissions Modeling
  - Existing/Baseline year: 2015
  - Future/Design year: 2030
  - May consider average weekday or weekend day
  - Model will calculate VMT changes based on recommended fees and incentives (total statewide and industry)
  - Model will calculate carbon emission changes (total statewide and industry)
  - Per SB19-239 (5.a.I), the model will calculate carbon emission changes that can be eliminated by incentivizing ZEVs as used for commercial purposes
- Commitments: Will complete baseline model (VMT and emissions) prior to September Stakeholder Working Group meeting.
- Schedule: Met July 24; next meeting: August 21; placeholder every other Wednesday from 2:00-3:00
- The subcommittee has had one meeting so far.
- They came up with a baseline for emissions for the fleet they are looking at and the transportation system as a whole.
- The group is also looking at the impacts of several kinds of solutions, such as reducing emissions and TDM demand.
- VMT and Emissions Modeling
  - Limited Data Available
  - Statewide Model StateFocus
  - Off-Model Estimation Techniques
  - Econometric Model(s)
    - Noted that the model changes with vehicle miles traveled.
- There is a strong overlap with what we are doing within the other subcommittees.

### Comments:

- Executive Director Lew asked what sort of thinking on what the methodology would be used to get at some of these questions, at least in the order of magnitude level?

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- Travis Madsen commented that the subcommittee would like to set up a meeting with a consultant to talk through some of these ideas. Broadly, identifying what the fleet of vehicles is exactly within the state of Colorado. We want to take a look at how much fuel these vehicles use and consume.
- Executive Director Lew asked, in terms of VMT would you look at vertical displacement effects and what types of scenarios would be in terms of vehicle miles traveled by different modes?
- Travis Madsen said yes, they would like to look at system effects.
- Executive Director Lew commented that this analysis sounds difficult but also interesting.
- Doug Rex, Executive Director of DRCOG, offered his help with contributing data to support the consultant analysis process for this effort.
- A SWG member on the phone asked if VMT would be related to vehicles or passengers.
- The subject of elasticity and its measurement was raised.
- Executive Director Lew mentioned price point elasticity and the potential to double up passenger impacts.
- Travis Madsen also noted that the impacts of how revenues generated are spent is another consideration.
- Doug Rex noted that DRCOG has had some success with Transportation Demand Management practices that should be reviewed and considered as part of this process. Incentivize shared ridership for new mobility.
- Representative Hansen commented that falling revenues based on VMT is a concern and that a higher demand will increase VMT is a consideration.

## Congestion Management: Incentivize Shared Ridership and New Mobility

### Sub-Committee (Bruce Abel, Regional Transportation District [RTD])

- Sub Committee has met on July 24 and August 14, 2019
- Discussed successful TDM Programs in Washington State, California, Oregon, DRCOG and NFRMPO. The committee went into DRCOG's TDM's programs. Some states, including Washington, Oregon, and California, require employers over a certain size to create and evaluate a TDM plan for their employees. This could take up the volunteer program that Colorado has now and raise it to another level.
- Congestion Management Ideas: Increase vanpools and increase employer driven TDM programs to reduce emissions and single occupancy/single purpose trips.
- Create partnerships with statewide TMAs and TMOs (Transportation Management Agencies/Transportation Management Organizations)
- Motivate employers (greater than XX employees) to create TDM Plans for staff
  - Employee education and outreach
  - Allow flexible work schedules
  - Vanpool program subsidy, Transit pass subsidy, or bike-share pass subsidy
    - On the congestion management side, we had a good conversation about vanpools. This is something we would like to explore as a committee.
  - Preferred parking for carpools and vanpools
  - Bike racks, lockers, and showers
  - Encourage Micro-mobility

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- Discussed possible strategies to help improve utilization of shared rides with TNCs:
  - Use fee structure to incentivize shared trips
  - Continue implementing TDM strategies for construction projects
  - Implement TDM strategies during special events (concerts, games, large events downtown) for both event staff and attendees
- Data needs:
  - What percent of TNC trips in Colorado are pooled?
  - What is the VMT, time of day of travel, revenue, and origins and destinations of commercial transportation companies including TNCs, Taxis, car rentals, peer car share, non peer car share, and commercial residential delivery?
  - How do commercial transportation companies route their packages? What percent of trips are combined?

### Comments:

- Per Bruce Abel, congestion management, vanpool discussions have occurred and should be explored further. TMAs could rise up and reach out to employers, consider TMA partnerships. Motivate employers to prompt changes.
- Sophie Shulman noted we need to talk about first and last mile to transit.
- Kate Williams commented that the Regional Transportation District (RTD) has had years of experience analyzing this.
- RTD recently had a first and last mile report that they could share with the group. This subcommittee already has that information and will share it with the group.
- DRCOG has similar information and will share it with the SWG members.

### Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies (Nick Farber, HPTA Director)

- Overall Goal
- The goal of the Fee Subcommittee is to develop recommendations to the Working Group regarding the type of fee and the structure of this fee.
- Progress and Meetings Held
  - Two Subcommittee meetings held so far (7th and 19th August)
- The group discussed:
  - Fee structures in place in other states (fixed fee, percentage of fare, fee per mile, and time in operation) and the pros/cons of each.
  - Criteria to evaluate the fee structure(s). Options being explored include: efficiency; compatibility with TABOR; equity; rural vs. urban; simplicity; and flexibility;
  - Data needs
  - The group thought it was challenging to discuss a fee without direction on how the funds will be used; and to evaluate fee structures without understanding where the funds will be invested.
- Schedule

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- September 11th (1:00 - 3:30 pm) and October 8th (1:00 – 3:30 pm). Additional meetings will be added before or after the working group meetings in September and October, as needed.
- What was discussed during the first two meetings were the fee structures that other states have presented so far, including time of day and urban or rural trips. Also looking at criterion to evaluate the fee structure. We want to have flexibility of the fee structure. We can either get nitty gritty with the fee or can make it fairly simple.
- The group is trying to focus on more policy related goals to the fees.
- The subcommittee discussed the difference between a fee and a tax under Colorado case law.
  - Tax: “If the primary purpose of a charge is to raise revenue for the general expenses of government, then the charge is a tax.”
  - Fee: “A charge is not a tax if the primary purpose of a charge is to defray the reasonable direct and indirect costs of providing a service or regulating an activity, because such a charge does not raise revenue for the general expenses of government.”
  - The money generated from a fee is to pay the direct or indirect cost of a fee or service. A fee offsets the direct cost of something that the fee is trying to offset and/or reduce.
  - There needs to be information as to why that fee is set at a certain price.
- Five areas of study –
  - Congestion: Mitigate increased congestion caused by TNCs and commercial vehicles by funding additional transit operations.
  - Zero Emission Vehicles: Mitigate increased congestion caused by TNCs and commercial vehicles by funding additional transit operations.
  - Equity and ride sharing: Mitigate lack of transportation options for low income, minority seniors and other at risk communities.
  - Mobility: Provide capital and operational funding to infrastructure investments to increase interconnectedness of transportation options
  - Safety: Infrastructure improvements

### **Comments:**

- Nick Farber, HPTE Director, provided an overview of the fee structure for commercial transportation providers in other states. Factors to consider include: time of day, urban/rural character of area, criteria to evaluate the fee structure, and TABOR’s impact.
- Need to connect fees to policy outcomes.
- We have not decided how to spend revenues and that is not the focus of this effort.
- Representative Hansen suggested using percentages and not get caught up in splitting dollars.
- Greg Fulton noted that recommendations are not one size fits all.
  - Need to be clear if the fee is in the best interest of mobility. The nexus of the fee and the service provided and justification for fees are something to consider. Also need to know and understand the existing fees already implemented.
- David Spector of KPMG noted that recommended fee structure should be proportionally sized to the congestion that results and then draw and connect the dots from the statewide travel model runs.
- Bruce Abel commented that we use fees to invest in mitigation of causes for the fees.

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### Social Impact and Equity Analysis (Kate Williams, DRMAC)

- Met on: July 24th and August 14th
- Developing a list of policy considerations
- Analyze data to look at gaps in mobility services: transportation deserts
- Consider impacts to drivers for commercial transportation providers
- Consider impacts to transportation users (riders)
- Consider impacts to package recipients
- Action Items:
  - Gather data from State Demographer Office
  - Lyft to provide data on driver demographics
  - CDOT develop map with a gap analysis of transportation providers
  - CDOT set up 'Google documents' with policy principles
  - Members to edit the document
  - Future meeting to be held in September
- We need to look at what this work does to mobility options and the effect that the mobility options will have on older adults and people that do not own cars. Elderly population is increasing, and many downtown residents don't own cars.
- A majority of rides within TNC are within low income neighborhoods.
- Approximately 50% of TNCs begin and end their trips in low income areas.
- Denver Considerations:
  - Met with the state demographer who explained that the population is now peaked out in Denver and is increasing throughout the rest of the state.
  - Committee is looking at age growth in Denver county.
  - We need to keep in mind that Denver is a city, county, state capitol, and includes half of the population for the state. This is different than the other places that we are comparing ourselves to within the model, such as Chicago.
- Need to consider how transportation options will evolve statewide. In terms of growth of aging population, we need to know who, what, where and when, and how the population is changing in ethnicity.
- Access to mobility will affect us all as we get older. We are working on serious recommendations.
- Need to not impede alternative mobility if fees are already on existing options.
- What we are talking about in this group is mobility and access to that mobility.
- Looking at data on driver and passenger demographics.

### Comments:

- Executive Director Lew noted the importance of obtaining passenger demographic data. As most data now is driver not passenger related.
- Jake Swanton noted we need demographic information quickly.
- Greg Fulton noted that currently food has no tax, but any cost increases to providers will be passed onto customers.

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### Safety (Lou Davenport, Iron Stride Solutions)

- Subcommittee Focus
  - Impact of emerging technologies to safety (positive and negative)
  - Emerging transportation technologies, transportation network companies, safety considerations to electric vehicle owners, public safety emergency response training and needs
  - Understanding the impact of emerging technologies impact on the roadway infrastructure – safety improvements or possible needs for emerging transportation technologies
  - Consumer, driver, operator impacts
  - The main purpose is safety related to TNCs. We are making sure that we clarify the purpose of our group.
- Lou Davenport overviewed the purpose of the subcommittee to identify level of safety for existing TNCs, or current technology only not autonomous vehicles (AVs).
  - Charles Meyer of CDOT Traffic Safety will evaluate data and a process for promoting safety. Please reach out to Ashley Nylen with questions on safety.
  - Evaluating TNCs, EVs, Emergency Responders and the impact on infrastructure, such as restriping for a start.
  - Assessing safety impacts to consumers, drivers and operators.
  - In terms of the meeting schedule, next on August 26<sup>th</sup> is to focus on key milestones and safety impacts. In September a brainstorming session will occur to develop recommendations.
  - Safety overlaps with all other subcommittees. Requested from other subcommittees, as safety topics arise, please send them over to the Safety subcommittee for consideration.
  - Background checks for drivers and age of drivers are being considered.
  - The subcommittee requested that everyone send all of their comments and notes in writing to the safety committee so that they can review these.
  - The goals of the committee is to identify positive and negative safety impacts that come along with the emerging technology.
  - Subcommittee is discussing pick up/drop off locations, driver and vehicle for mobility services, infrastructure considerations, and understanding and measuring impacts to VMT's.
- Safety is impacted by a lot of the other subcommittees. As safety topics come up, send this information over to the safety subcommittee. The subcommittee requested that everyone send all of their comments and notes in writing to the safety committee so that they can review these.

### Comments:

- Greg Fulton commented that with the more friendly bicycle/pedestrian infrastructure comes a conflict with freight and movement of goods for the first and last mile. Trucks end up needing to double-park in order to make deliveries because Uber and Lyft vehicles are taking up the space of the drop off/unloading zone. Land use design and infrastructure needs to accommodate deliveries. UPS and RedEx are seeing an increase in tickets in these areas. Recommended that we need to measure some of the land use to accommodate for the deliveries and the Uber curbside pickup.

# Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

## Meeting # 2 August 19, 2019

CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium

- Lou Davenport noted there are safety concerns with pickup and drop off locations for both passenger vehicles and package deliveries.

### Question/Answer Period of Subcommittee Updates

- Jonathan Bartsch asked if any SWG members had questions or concerns to raise regarding the subcommittee updates.
- Jake Swanton commented that safety concerns related to vehicle inspections, how do we resolve this and the differing opinions regarding the scope of SB 19-239.
- Elise Jones of Boulder County asked who is in charge of aligning all of this with statewide goals.
- Rolling up fees further.
- Representative Hansen noted that this process is part of a larger piece of the package. For the transportation sectors – we are finding funding for infrastructure ultimately.
- Executive Director Lew commented that this is the right conversation for identifying a future vision. A subset of transportation has evolved, and how to pay for it and invest in it. This is a much broader conversation.
- Will Toor added that this work is focusing on an emerging new business models that are here today, one of the really large potential change we will see is the emergence of autonomous vehicles.
- Jonathan Bartsch noted that AVs are in the shadows. We will go back and re-evaluate findings to determine what is the order of operations of this task. The SWG is the operations group, here is where silos are avoided and recommendations will be vetted through multiple lenses.
- Comment: What is the time constraint and order of operations that we have to take the information from one sub committee and apply that to the conversations and work that we are having in other subcommittee topics? We want to make sure that our references to the group are vetted through different lenses.
- Sophie Shulman explained that CDOT and CEO are participating in all of the subcommittees and coordinating among them.
- Lou Davenport suggested subcommittees share interim recommendations with each other, and asked about the format/template for recommendations, and if they should be consistent.
- It was explained that as part of project milestones, that the SWG will review recommendations next before they are finalized.
- Greg Fulton noted that we have a large funding shortfall. But in terms of fees, don't jeopardize the larger picture. This is part of a larger package eventually. Some entities already are paying fees.

### Moving Towards Alternative Evaluation

- Jonathan Bartsch explained that the next items for today to cover are related to principles and benchmarks for strategies to mitigate impacts, change behaviors, prompt EV use, etc.
- Need to determine which strategies are the most important.

### Develop Criteria Used to Evaluate Strategies and Recommendations (Exercise)

SWG members formed small groups to discuss the identification of initial strategy recommendations.

Jonathan Bartsch facilitated a discussion regarding the results of the smaller group conversations.



# Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

## Meeting # 2 August 19, 2019

CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium

### Comments:

- Travis Madsen noted that the opportunity here is bigger than the legislation. For the future deliver on the four criteria.
- We need to future-proof our recommendations.
- Nick Farber said that we need to future-proof our recommendation. He cautioned that whatever the recommendations are, that the amount of revenues that is brought in is not depreciating.
- The ability to change behaviors to decrease VMT and reduce greenhouse gas (GHG) emissions as a top priority.
- Different incentives for TNCs to drive social behavior. Promote TNCs as last mile mobility devices. Reducing fees or eliminating fees if they were used in conjunction with a transit service. Use statewide incentives for TNC use.
- Consider last mile mobility devices in conjunction with transit service. Consider delivery vehicle incentives too per Jeff Cleland of Amazon.
- EV adoption when no options are available for commercial vehicles – consider as close to zero-emissions as possible.
- Currently there is no incentive to get electric fleets. Will there be a fee to punish us if we don't adopt something, if we don't have the option to adopt it?
- Need to change behavior for sharing rides to reduce congestion. Having the structure to incentivize TNCs if they are a shared ride. Using the fees to incentive shared ridership.
- Fees underwrite program to reduce VMT and connect fees to GHG emissions.
- Sophie Shulman spoke of simplicity in implementation. The more simple our process is, the more money from the fee that will go to incentivizing the things that we want to incentivize.
- Lou Davenport identified that there will be 100s of recommendations and asked how we will compare them – ability to reduce GHG emissions or based on funds they can generate, for example. Could consider conversion of dollars to carbon emissions.
- One way to translate carbon into money is to use the language in SB 236.
- Kate Williams noted that changing behavior is a top priority charge a copay as part of the fare.
  - We could incentivize with a punch card approach – use these trips so often and you get one ride free.
  - Could have penalties too to discharge SOV travel for folks who drive every day.
- Greg Fulton added some recommendations may be in conflict with each other. It will be a balancing act to decide incentives and penalties. For commercial stress as close as we can for ZEVs, we also don't have enough drivers right now, we need time to balance all impacts.

### Comparison of Fee Structures in Other Cities and States (Lily Lizarraga, CDOT Innovative Mobility)

- Looking into what types of fee structures are common within the USA. We have seen a range in the types of fees and what types of fees that are collected. A per trip fee ranges from \$0.10 to \$5.72 when looked at different states, cities, and one airport during this analysis.
- Apart from collecting inventory, we also called different states and cities and spoke to those people involved in the process.



# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting # 2 August 19, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

- Measures from the State of California, San Francisco, Chicago, New York City, Denver International Airport, and Washington D.C., were discussed.

### Comments:

- A list of questions and a national map pertaining to fee structures was disseminated by Lisa Streisfeld, CDOT Mobility Assistant Director.
- Doug Rex of DRCOG noted that there are a variety of amounts related to fees. Why and how were these numbers determined?
- Lily Lizarraga responded that the reasons and amounts varied by entity.
- Sophie Shulman noted that in many instances fee amounts were negotiated between the parties involved.
- Jeff Cleland of Amazon asked about “EU bars” and if any reduction studies with outcomes and measures have been obtained.
- Currently there is no outcome information from the fees.
- Resistance to fees was expressed by a SWG member.
- Kate Williams commented that data regarding before and after effects of implementing a fee structure would be important information to have.
- Bruce Abel mentioned the impact of growing demand with an expectation of quicker deliveries in less time – wondered how we can get information regarding this.
- Kate Williams asked how we can make the best use of available data collection software to inform this process.

### [Literature Review Report Out \(Erika Miller, PhD, Colorado State University\)](#)

Erika Miller provided an overview of the potential impacts of new and emerging technologies and business models on transportation system. Items discussed included: TNCs across USA, travel, behavior, EV penetration, transportation funding sources, incentives, fee structures, and a case study from New York City.

Key findings from TNCs Across the USA includes, while Uber and Lyft are vastly out-stripped by personal and commercial vehicles, Uber and Lyft are still responsible for significant shares of VMT in those cities. The data for Lyft users across the USA is that 35% of users do not own or lease a personal vehicle and 50% of those say they are likely to purchase one if services become unavailable. Lyft in Colorado data revealed that 23% of riders take Lyft to get around when public transit does not operate, late night rides account for 11% of rides, and 54% of rides begin or end in low-income/underserved areas.

Key findings regarding travel behavior includes, the average person in the US took 2.8 trips per day in 2018. In 2016, 76.6% of workers in US commuted by driving alone, and only 9.0% of workers carpoolled (a drop from 19.7% in 1980).

Regarding equality, lower-income individuals typically spend a much larger portion of their income on fuel taxes than wealthier individuals do.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting # 2 August 19, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

If plug-in electric vehicles make up at least 40% of new vehicle sales globally by 2040, this will cause GHG to stabilize at 450 ppm.

Several states are considering creating new transportation funds, such as: road usage charge, tolling, and fees and taxes for vehicles that do not use gasoline.

Fee Structures discussed included congestion pricing, road usage charges as seen in Delaware, Washington, Oregon, California, and Colorado, and TNC fees/taxes.

Eirka Miller also discussed a case study from New York City from the NY State DOT to reduce single-occupancy vehicles. NY State DOT generated mass awareness of alternative commuting options. Launched innovative media and outreach campaigns to visualize environmental benefits, cost-effectiveness, and availability of rideshare/mobility services. Results included consolidating 3.7 million single-occupancy vehicles off the road, reducing traffic by 20%, 12,100 tons of CO<sub>2</sub> reduced, and 201,560 commuters connected.

### **Comments:**

- Greg Fulton noted that regarding TNC use, there definitely is a shift from taxi and transit use.
- Will Toor commented that the infrastructure needs over the next 10-15 years will change with EV adoption.
- Celeste Stragand, of Ford, asked about modeling trips, and off-peak times of service.
- Kate Williams noted that the upfront cost of EVs is higher, but rebates cover this additional \$6,000 average cost. However fuel costs are approximately 2.5 times less with EVs.
- Steve Douglas of the Auto Alliance disagreed indicating that the Nissan Leaf costs is roughly \$14-15 thousand and that is far below the cost of a traditionally fueled car.
- A SWG member commented that we need to watch for unintended consequences of fees that are not equitable.
- Joshua Sperling, representing National Renewable Energy Lab (NREL), noted that they have data on the revenue changes from TNCs at DEN.

## **Public Comment Period**

Will these fees lead to less car registration, less drivers registration, and less tickets? What will we do with the amount of money generated from these fee structures? We need to make these fees neutral, so the fees that are implemented end up being a rebate to others. We also need to be thinking along the lines of unintended consequences that come along with these fee structures. For example, changes in fee structures of taking an Uber to the airports are not making up for the loss of fees that are associated with the airport losing money from people no longer parking their cars at the airport. We need to look at how these fees can be cost neutral.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting**

## **Notes**

### **Meeting # 2 August 19, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

## **Next Steps**

### **Wrap Up & Action Items**

Below is a list of the upcoming stakeholder meetings.

Stakeholder Working Group Meeting # 3 will take place on September 26, 2019 from 8:00 am - 12:00 pm at the CDOT Offices.

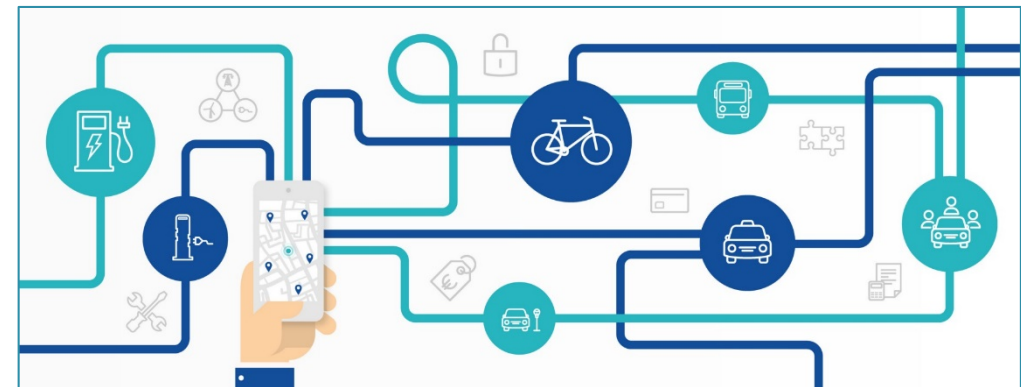
Stakeholder Working Group Meeting # 4 will take place on October 24, 2019 from 1:00 pm - 4:00 pm at the CDOT Offices.

The report is due on November 1, 2019.



# 2019 Emerging Mobility Impact Study Stakeholder Working Group Meeting # 2

August 19, 2019  
1:00 pm to 4:15 pm  
CDOT Auditorium  
2829 West Howard Place, Denver, CO 80204





# Agenda



ITEM	TOPIC		TIME
1	Project Management	<ul style="list-style-type: none"> <li>Welcome and Introductions</li> <li>Adoption of Meeting Notes from June 28, 2019 (See Attachment)</li> <li>Adoption of Operating Protocols (See Attachment)</li> <li>Introduction of Consultant Team</li> <li>Project Schedule and Key Milestones</li> </ul>	1:00-1:30
2	Data and Findings	<ul style="list-style-type: none"> <li>Providers Covered under SB 19-239 and Comparison of Requirements</li> <li>Discuss Modeling Assumptions</li> </ul>	1:30-1:40
3	Sub-Committee Research	<ul style="list-style-type: none"> <li>Updated Sub-Committee Descriptions and Reports (See Attachment)</li> <li>1. Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs</li> <li>2. Natural Environment Impact and Emissions Analysis</li> <li>3. Congestion Management: Incentivize Shared Ridership and New Mobility</li> <li>4. Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies</li> <li>5. Social Impact and Equity Analysis</li> <li>6. Safety</li> </ul>	1:40-2:45
4		Break (10 Minutes)	2:45-2:55
5	Moving Towards Alternative Evaluation	<ul style="list-style-type: none"> <li>Develop Criteria Used to Evaluate Strategies and Recommendations (Exercise)</li> <li>Comparison of Fee Structures in Other Cities and States (See Attachment)</li> <li>Literature Review Report Out (See Attachment)</li> </ul>	2:55-3:55
6		Public Comment Period	3:55-4:05
7	Next Steps	<ul style="list-style-type: none"> <li>Wrap Up &amp; Action Items</li> </ul> <p>Stakeholder Working Group Meeting # 3 September 26, 2019 8:00 am - 12:00 pm  Stakeholder Working Group Meeting # 4 October 24, 2019 1:00 pm - 4:00 pm  Report Due: November 1, 2019</p>	4:05-4:15



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## Adoption of Meeting Notes from First Stakeholder Working Group Meeting on June 28, 2019





# Adoption of Operating Protocols



**COLORADO**  
Department of Transportation



**COLORADO**  
Energy Office

## DRAFT OPERATING PROTOCOLS

of the

## STAKEHOLDER WORKING GROUP

for the 2019 Emerging Mobility Impact Study

DRAFT June 28, 2019

*For Discussion Purposes Only*

### I. STAKEHOLDER WORKING GROUP PURPOSE

The purpose of the Stakeholder Working Group for the 2019 Emerging Mobility Impact Study is to collaboratively develop recommendations to the Colorado Department of Transportation (CDOT) regarding the impacts of the adoption of new and emerging transportation technologies and business models and identify strategies to address the impacts.

### II. BACKGROUND

In May 2019, the Colorado State Legislature passed [Senate Bill 19-239](#), "Requiring the Department of Transportation to convene and consult with a stakeholder group to examine impacts of new transportation technologies and business models, identify means of addressing impacts and report findings and make recommendations to the General Assembly."

Based on this legislative direction, Colorado Department of Transportation (CDOT) and the Colorado Energy Office (CEO) are convening a Working Group that will plan, study, assess, and consider investments to more efficiently utilize our transportation system. This work to study new and emerging technologies, including their environmental impacts, builds on Governor Polis's first [Executive Order, B 2019 002](#) Supporting a Transition to Zero Emission Vehicles.

### III. STAKEHOLDER WORKING GROUP CHARGE





## Introduction of the Project Team Leads

### CDOT

- Shoshana Lew
- Sophie Shulman
- Office of Innovative Mobility
- HPTE
- Division of Transportation Development
- Office of Policy & Government Relations
- Division of Traffic Safety and Engineering

### CEO

- Will Toor
- Christian Willis
- Maria DiBiase Eisemann

### CSU

- Erika Miller, PhD
- Somayeh Aliebrahimi

### CDR and Associates

- Jonathan Bartsch
- Melissa Rary

### HDR

- Christopher Primus
- Carla Perez
- Jason Longsdorf
- Smith Myung

### Cambridge Systematics

- Evan Enarson-Hering
- Michelle Bina
- Martin Milkovits

### S-Curve Strategies

- April Bolduc
- Matt Zerega



## Project Schedule

Six Sub-Committees Provide Input to the Stakeholder Working Group Meetings





# Project Milestones



Stakeholder Working Group Meeting # 1 June 28, 2019  
Develop 6 Sub-Committees, Review Legislation

Stakeholder Working Group Meeting #2 August 19, 2019  
Review Fee Structure in Other Agencies, Develop Criteria to Evaluate Alternatives

Stakeholder Working Group Meeting #3 September 26, 2019  
Review Health Certificate Requirements and Discuss Recommendations  
Review Fee Structure Options and develop Rates, Discuss Possible Investments

Stakeholder Working Group Meeting #4 October 24, 2019  
Prioritize Recommendations, Review Final Report

Recommendations and Report Due November 1, 2019

The project team begins modeling of existing conditions for vehicle miles travels and carbon emissions.

The project team takes recommendations and ranks against the criteria.

The project prepares draft report for Stakeholder Working Group review.

The project team takes comments and finalizes the report.



## Emerging Commercial Transportation Providers Covered Under Senate Bill 19-239

### TRANSPORTATION NETWORK COMPANY

- A motor vehicle that is used to provide passenger transportation services purchased through a transportation network company, as defined in section 40-10.1-602 (3)
- Examples: Uber, Lyft, Hop Skip Drive

### PEER CAR SHARE

- A peer-to-peer car sharing company
- Examples: Turo, Getaround, Maven, Drift

### CAR CLUBS: NON-PEER CAR SHARE

- A car sharing company that does not use a peer-to-peer business model
- Examples: Streetcar, ZipCar, Car2Go, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz

### TAXI

- A company that provides taxicab service as defined in Section 40-10.1-101 (19)
- Examples: Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative

### CAR RENTAL

- A motor vehicle that is rented out by a rental car company
- Examples: Enterprise, Avis, Hertz, Budget, and others

### RESIDENTIAL DELIVERY

- A motor vehicle that is used for residential delivery of goods (under 14,000 lbs. weight vehicle)
- Examples: Uber Eats, Door Dash, UPS, Fed Ex, restaurant food delivery, package delivery, grocery home deliveries



**COLORADO**  
Department of Transportation



**COLORADO**  
Energy Office

# Comparison of Requirements in Colorado

## C.R.S. 40-10.1-601

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Brian Chesher, Colorado Department of Regulatory Affairs  
Public Utilities Commission

# Comparison of Requirements in Colorado

## C.R.S. 40-10.1-601 (Regulated by the Public Utilities Commission)

	Regulating Agency	Company Requirements	Driver Requirements	Vehicle Requirements	Fares	Fees
TNC-Transportation Network Company	Public Utilities Commission under Colorado Department of Regulatory Agencies	TNC Insurance Alcohol Policy Review Driver History annually, Criminal History Check and National Sex Offender Database of Driver Limits on who can be a driver based upon convictions; Maintain 1-yr logged data for license, driver ID, date, time location (long/latt) for pick up and drop off	Valid Driver's License Primary Driver Liability Insurance of \$1M Health Certificate-driver is medically fit to drive Limit 12 hours of consecutive driving, must be 21 years old cannot log in after 16 cumulative hours; can log in more than 70 hours in 7 day period; drivers are independent contractors	Automobile Insurance Proof of Colorado Vehicle Registration  Vehicle Safety inspection annually  Referral ADA rider to another service with appropriate equipment	Pre published prices; surge pricing permitted	TNC has annual permit with PUC
Taxi	Public Utilities Commission under Colorado Department of Regulatory Agencies; US Depart of Transportation	One year of logged data with Cab number, name, trip date time pick up and destination address; multi-load in Must provide 24 hour a day service in certain densities. Certificate of Public Convenience and Necessity Contract Carrier Permit Exempt Passenger Carrier Registration	Background check; health certificate; taxi are independent contractors	Taxi license plate Cab number inside vehicle Not allowed to multi-load without permission; minimum number of operating vehicles in several counties	Some flat rates, Fares governed by zones A-D with max rates to DIA, complicated multi-loading & drop fees; max rates in certain counties; limits on delay due to traffic	Annual vehicle identification fee.



## Comparison of Requirements in Colorado

	Regulating Agency	Company Requirements	Driver Requirements	Vehicle Requirements	Fares	Fees
<b>Commercial Parcel and Package Delivery</b> (e.g. UPS, FedEx, DHL)	U.S. Dept. of Transportation	Background check	Class C Commercial Driver's License (CDL) (FedEx cargo van driver) or no CDL (UPS parcel driver)  Safe driving record	Commercial fleet operations for drivers and independent contractors. Common vehicles include cargo vans and 12' or larger box trucks.		Unified Carrier Registration (UCR) fleet size fee structure
<b>Independent Contractor Package and On-Demand Delivery</b> (e.g. Amazon Flex, Grubhub, Postmates, GoShare)		Background check and other employer requirements	Commercial vehicle insurance may be provided (e.g. Amazon Flex)  19 – 21 + or over with valid driver's license	Mid-sized 4-door sedan or larger vehicle (e.g. Amazon Flex)  Vehicle no older than 15 years (e.g. GoShare)  No commonly established vehicle requirements for other independent food and good deliveries.	Mileage and time based fares (wages) for food delivery	
<b>Commercial On-Demand Delivery</b> (e.g. 3 <sup>rd</sup> party Delivery Service Partner, establishment-based grocery or food delivery)		Employer requirements vary - typically valid driver's license, 18 years of age, safe driving record	NO Commercial Drivers License (CDL) required	No commonly established vehicle requirements food and good deliveries.	Wage	Business registration and licensing with State of Colorado for employer.





# Commercial Delivery Providers



## Commercial Parcel and Package Delivery

(e.g. UPS, FedEx, DHL)

- Establishment-based, may use independent contractors
- Often interstate carriers subject to USDOT regulation
- Mixed delivery fleets with some vehicles subject to state and Federal commercial motor vehicle regulation



## Commercial On-Demand Delivery (e.g. 3<sup>rd</sup> party Delivery Service Partner, establishment-based grocery or food delivery)

- Establishment-based
- Likely intrastate carriers
- Leased or owned vehicle fleets may be subject to some commercial motor vehicle regulations

## Independent Contractor Package and On-Demand Delivery (e.g. Amazon Flex, Grubhub, Postmates, GoShare)

- Independent contractors
- Not subject to commercial motor vehicle regulations
- Personal vehicles used







## Modelling Baseline Estimates – Key Questions

TRANSPORTATION NETWORK  
COMPANY

*How many vehicles or drivers are operating in Colorado?*

PEER CAR SHARE

*What vehicles types, engines, and classifications are in use?*

CAR CLUBS: NON-PEER CAR SHARE

*What are some of the volume and activity patterns associated?*

TAXI

*How can we estimate total vehicle miles travelled?*

CAR RENTAL

*What levels of carbon emissions are associated with travel?*

RESIDENTIAL DELIVERY

## Modelling Limitations



**Observed Data** – Provides a clear point-in-time picture. Actual counts or real world data. Useful for calibrating models or estimates or applying national data to Colorado context.



**Modelling and Forecasting** – Provides big picture approximation of conditions. Based on observed data using established statistical techniques. Supports range of forecasts and information for Colorado.



**Estimation Techniques** – Help fill in basic details and provide rough estimates. Sketch planning tools or analytical assumptions. Based on observed or modelled data, but may be less sensitive or unique to Colorado.

## Modeling and Estimation Approach

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Compile any and all observed data from Colorado operators

Evaluate national or other regional datasets for comparisons or starting points

Apply available modeling tools – include CDOT’s “StateFocus” travel model – to estimate travel patterns, travel changes, and emissions

Consider sketch planning and off-model estimation techniques to test broad policy considerations

Develop econometric models to test price and policy sensitivities



(credit: CBS)



## Updated Sub-Committee Descriptions

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Location where you can access:

<https://drive.google.com/drive/folders/1ImgUMI8ZORNy-UGxTgjLE-Vncc8C5fl6>



# Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs\* Sub-Committee

Matthew Frommer

\*ZEV=Zero Emission Vehicles which include:

- BEV=Battery Electric Vehicles,
- PHEV=Plug In Hybrid Electric Vehicles,
- RNG=Renewable Natural Gas Vehicles,
- Hydrogen Vehicles







# Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs\* Sub-Committee

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## Work Plan

1. Benefits of ZEVs in the Emerging Commercial Transportation Sector
2. Barriers to ZEVs in the Emerging Commercial Transportation Sector
3. Potential Tools and Strategies to Incentivize ZEVs in the Emerging Commercial Transportation Sector
4. Sub-Committee Recommendations

\*ZEVs=Zero Emission Vehicles which include:

- BEV=Battery Electric Vehicles,
- PHEV=Plug In Hybrid Electric Vehicles,
- RNG=Renewable Natural Gas Vehicles,
- Hydrogen Vehicles



## Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs\* Sub-Committee

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- What are the recommended tools and strategies that the State of Colorado should pursue to better incentivize electrification (conversion to ZEVs) in the emerging commercial transportation sector?
- What are the estimated impacts of these tools and strategies?
- Can any of these tools and strategies be integrated into a potential fee structure developed by the full SB19-239? If so, how?
- What data would be necessary for the State of Colorado to develop, gather, and track in order to implement the Sub-Committee's recommendations?
- In addition to State policy, how can other key stakeholders facilitate the adoption of ZEVs for commercial fleets and what are the recommended tools and strategies to support a system-wide transformation?

\*ZEV=Zero Emission Vehicles which include:

- BEV=Battery Electric Vehicles,
- PHEV=Plug In Hybrid Electric Vehicles,
- RNG=Renewable Natural Gas Vehicles,
- Hydrogen Vehicles



# Natural Environment Impact and Emissions Analysis Sub-Committee

Travis Madsen







# Natural Environment Impact and Emissions Analysis Sub-Committee

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## Conduct Vehicle Miles Traveled and Carbon Emissions Modeling

- Existing/Baseline year: 2015
- Future/Design year: 2030
- May consider average weekday or weekend day
- Model will calculate VMT changes based on recommended fees and incentives (total statewide and industry)
- Model will calculate carbon emission changes (total statewide and industry)
- Per SB19-239 (5.a.I), model will calculate carbon emission changes that can be eliminated by incentivizing ZEVs as used for commercial purposes

Commitments: Will complete baseline model (VMT and emissions) prior to September Stakeholder Working Group meeting

Schedule: Met July 24; next meeting: August 21; placeholder every other Wednesday from 2:00-3:00



## Approach to Modeling

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VMT and Emissions Modeling

Limited Data Available

Statewide Model *StateFocus*

Off-Model Estimation Techniques

Econometric Model(s)



# Congestion Management: Incentivize Shared Ridership and New Mobility Sub-Committee

Doug Rex, DRCOG



Amazon's Scout delivery robot is shown in this photo provided July 26, 2019. Courtesy Amazon.com/Reuters via REUTERS

# Congestion Management: Incentivize Shared Ridership and New Mobility Sub-Committee

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Sub Committee has met on July 24 and August 14, 2019

Discussed successful TDM Programs in Washington State, California, Oregon, DRCOG and NFRMPO.

Congestion Management Ideas: Increase vanpools and increase employer driven TDM programs to reduce emissions and single occupancy/single purpose trips

Create partnerships with statewide TMAs and TMOs (Transportation Management Agencies/Transportation Management Organizations)

Motivate employers (greater than XX employees) to create TDM Plans for staff

- Employee education and outreach
- Allow flexible work schedules
- Vanpool program subsidy, Transit pass subsidy, or bike-share pass subsidy
- Preferred parking for carpools and vanpools
- Bike racks, lockers, and showers
- Encourage Micro-mobility

# Congestion Management: Incentivize Shared Ridership and New Mobility Sub-Committee

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Discussed possible strategies to help improve utilization of shared rides with TNCs:

- Use fee structure to incentivize shared trips
- Continue implementing TDM strategies for construction projects
- Implement TDM strategies during special events (concerts, games, large events downtown) for both event staff and attendees

## **Data needs:**

What percent of TNC trips in Colorado are pooled?

What is the VMT, time of day of travel, revenue, and origins and destinations of commercial transportation companies including TNCs, Taxis, car rentals, peer car share, non peer car share, and commercial residential delivery?

How do commercial transportation companies route their packages? What percent of trips are combined?





# Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies Sub-Committee

Nick Farber



# Report Out from Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies Sub-Committee

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## Overall Goal

- The goal of the Fee Sub-committee is to develop recommendations to the Working Group regarding the type of fee and the structure of this fee.

## Progress and Meetings Held

- Two Subcommittee meetings held so far (7<sup>th</sup> and 19<sup>th</sup> August)
- The group discussed:
  - Fee structures in place in other states (fixed fee, percentage of fare, road use charge, fee per mile, and time in operation) and the pros/cons of each.
  - Criteria to evaluate the fee structure(s). Options being explored include: efficiency; compatibility with TABOR; equity; rural vs. urban; simplicity; and flexibility;
  - Data needs
- The group thought it was challenging to discuss a fee without direction on how the funds will be used; and to evaluate fee structures without understanding where the funds will be invested.

## Schedule

- September 11<sup>th</sup> (1:00 - 3:30 pm) and October 8<sup>th</sup> (1:00 – 3:30 pm). Additional meetings will be added before or after the working group meetings in September and October, as needed.

## Commercial Vehicles Fees – parameters and opportunities

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### Fee vs. Tax

**Tax:** *“If the primary purpose of a charge is to raise revenue for the general expenses of government, then the charge is a tax.”*

**Fee:** *“A charge is not a tax if the primary purpose of a charge is to defray the reasonable direct and indirect costs of providing a service or regulating an activity, because such a charge does not raise revenue for the general expense of government.”*

*Source: 2018 CO 36 No. 16SC377, Colorado Union of Taxpayers Found. v City of Aspen—Taxation— Constitutional Law—Local Government Law.*





# Connecting Fees to Policy Outcomes

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## **Congestion**

- Mitigate increased congestion caused by TNCs and commercial vehicles by funding additional transit operations

## **Zero – emissions vehicles**

- Incentivize the adoption of zero-emissions vehicles and infrastructure

## **Equity and ride sharing**

- Mitigate lack of transportation options for low income, minority seniors and other at risk communities

## **Mobility**

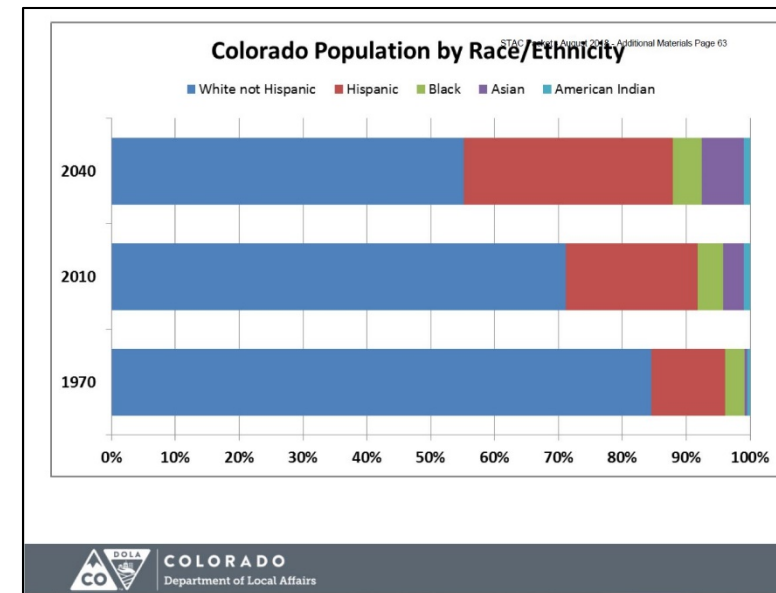
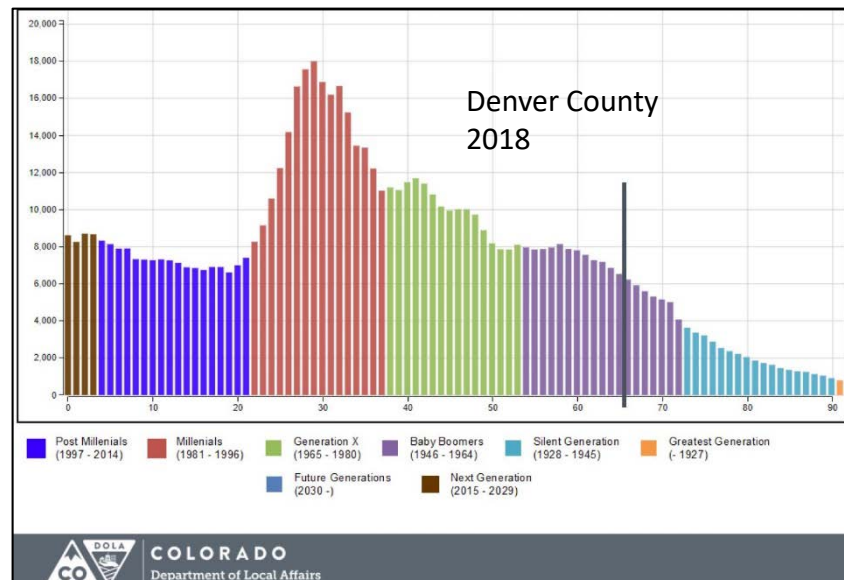
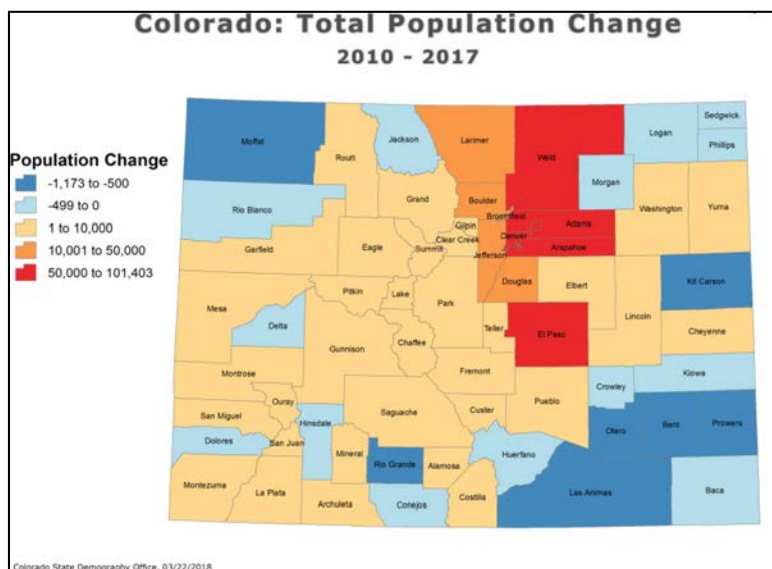
- Provide capital and operational funding to infrastructure investments to increase interconnectedness of transportation options

## **Safety**

- Infrastructure improvements

# Social Impact and Equity Analysis Sub-Committee

Kate Williams



## Social Impact and Equity Analysis Sub-Committee

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1. Met on: July 24<sup>th</sup> and August 14<sup>th</sup>
2. Developing a list of policy considerations
2. Analyze data to look at gaps in mobility services: transportation deserts
3. Consider impacts to drivers for commercial transportation providers
4. Consider impacts to transportation users (riders)
5. Consider impacts to package recipients

### Action Items:

1. Gather data from State Demographer Office
2. Lyft to provide data on driver demographics
3. CDOT develop map with a gap analysis of transportation providers
4. CDOT set up 'Google documents' with policy principles
5. Members to edit the document
6. Future meeting to be held in September

## Safety Sub-Committee

Chair: Lou Davenport

CDOT Staff Support:

- Charles Meyer, State Traffic & Safety Engineer
- Ashley Nysten, Connected & Autonomous Technology Program



## Sub-Committee Focus

- Impact of emerging technologies to safety (positive and negative)
- Emerging transportation technologies, transportation network companies, safety considerations to electric vehicle owners, public safety emergency response training and needs
- Understanding impact of emerging technologies impact on the roadway infrastructure – safety improvements or possible needs for emerging transportation technologies
- Consumer, driver, operator impacts

## Sub-Committee Early Discussion



Pick up / drop off hotspots



Driver/vehicle requirements  
for mobility services



Infrastructure considerations  
Understanding/measuring impact to  
VMT

## Sub-Committee Plan Moving Forward

**Meeting 1:**  
Introductions and  
Discussion  
(July 24<sup>th</sup>)



**Meeting 2:**  
Identification of  
Positive and  
Negative Impacts  
to Safety  
(August 26<sup>th</sup>)



**Meeting 3:**  
Identify  
recommendations  
for identified  
impacts  
(September 11<sup>th</sup>)



**Meeting 4:**  
Finalize  
recommendations  
to present to  
Stakeholder  
Working Group  
(October 11<sup>th</sup>)



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# Break (10 minutes)

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## Develop Criteria to Evaluate Strategies (Exercise)

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Jonathan Bartsch, CDR

The SB 19-239 Legislation Asks the Stakeholder Working Group to Develop a Fee Structure to:

- Reduce Carbon Emissions
- Reduce Congestion
- Increase Adoption and Use of ZEVs
- Increase Shared Ridership

What are the Principles and Benchmarks that Should be Used to Assess and Prioritize Strategies?

How Will the Stakeholder Working Group Prioritize the Recommendations?



# Comparison of Fee Structures in Other Cities and States

## Lily Lizarraga

NYC becomes first US city to regulate ride-hailing | Smart Cities Dive

SMARTCITIES DIVE

DEEP DIVE

### NYC becomes first US city to regulate ride-hailing

Drivers must now receive a minimum wage of \$17.22 an hour, while new licenses will be frozen for a year as the Taxi and Limousine Commission studies the industry.

By Chris Teale

Published Aug. 9, 2018

**T**he New York City Council voted Wednesday to regulate ride-hailing apps like Uber and Lyft, becoming the first city in the United States to do so.

The new rules include temporarily ending the issuing of new for-hire vehicle (FHV) licenses and adding a new license category for the companies. The new license category covers companies that have at least 10,000 trips per day, which must apply for a two-year license from New York's Taxi and Limousine Commission (TLC) and submit a business plan to demonstrate a need for service.

The city will also include a drivers' minimum wage requirement and provide for a year-long study of the industry. Following the

### Restaurants, drivers grapple with challenges from expansion of food-delivery apps



MEGAN TOMASIC | Sunday, August 4, 2019 2:00 p.m.



### Lawmakers pass bill on statewide rules for Uber, Lyft

Updated Mar 07, 3:39 PM, Posted Feb 13, 9:43 PM



Alabama Gov. Kay Ivey speaks at a rally in support of a bill setting up statewide regulations for ride-sharing companies like Uber and Lyft.

0 shares

By Mike Cason | [mcason@al.com](mailto:mcason@al.com)

The Legislature has passed a bill to set up statewide regulations for ride-sharing companies like Uber and Lyft.

The Senate passed the bill today by a vote of 27-0, sending it to Gov. Kay Ivey, who can sign it into law. Ivey has said [she supports the legislation](#).





## Preliminary Inventory Results

### Lily Lizarraga

- 10 Cities, 14 States, 1 airport
- A per trip fee ranges from \$0.10 to \$5.72
- A percent of fare free ranges from 0.33% to 6%
- ✱ Additional Research Will Investigate Fees on Other Commercial Transportation Modes: Including TNCs, Taxis, Rental Cars, Peer Share, Non-Peer Car Share, & Residential Delivery

What is the rate for the fee or tax collected?

Where does the revenue go?

How are the funds collected?

What type of data is being collected?

How successful is the program? What type of revenue has been generated?

How has program been received by stakeholders?

How long has the program been administered

Was a study conducted before initiating the program?

Was an equity analysis taken into account?

What incentives are employed to encourage EV adoption?

Location of Database

[https://drive.google.com/drive/folders/1iGKK-f\\_GW6JQJ3DNUDDQwpeNBtzo2DO-](https://drive.google.com/drive/folders/1iGKK-f_GW6JQJ3DNUDDQwpeNBtzo2DO-)



## Cities and States with TNC Taxes or Fees (as of March 2019)



✱ Additional Research Will Investigate Fees on Other Commercial Transportation Modes: Including TNCs, Taxis, Rental Cars, Peer Share, Non-Peer Car Share, & Residential Delivery

Location	Amount Collected	Revenue	Collected by? How collected?	Collecting any data? Willing to share?	Success of the program/ Revenue generated
California	0.33% of total TNC revenue--suspended 2019 Recently passed a 10 cent fee per ride under SB 1376: <a href="https://leginfo.ca.gov/faces/b">https://leginfo.ca.gov/faces/b</a>	0.33%: 100% to California Public Utilities Commission Transportation Reimbursement Account (to be used to regulate TNCs) 10 cent fee: subsidizing wheelchair	Public Utilities Commission	Have been collecting data since 2014--TNCs must report annually on ride dates, times, zip code of start and end, total time, total VMT. Recently passed a GHG Reduction law for TNCs and will start collecting more specific	Under the 0.33% fee, so much revenue came in that the PUC had excess funds, hence the State Department of Finance suspended the fee
Chicago	\$0.72 per ride, \$5.72 for O'Hare, Midway, McCormick Place & Navy Pier	-60¢ to city general fund -2¢ to Business Affairs and Consumer Protection (admin fee) -10¢ to city accessibility fund (conversion of taxis/TNCs to be	Department of Business Affairs and Consumer Protection	Collect substantial data on TNC trips (distance, time, cost, whether shared riding was authorized, etc.) <a href="https://data.cityofchicago.org/Transportation/Transportation-Network-Providers-Trips/m6dm-">https://data.cityofchicago.org/Transportation/Transportation-Network-Providers-Trips/m6dm-</a>	Anticipated \$30 million in 2019
San Francisco (not yet passed--needs vote to pass in November with 2/3 support)	3.25% tax to single rides, 1.5% for shared rides or rides in an EV	Estimated to raise \$35 million annually for transit and safety projects	Office of the Treasurer and Tax Collector	Research study through Northeastern to study number of trips and locations of trips using APIs of the rideshare apps. Separate congestion charging study is currently underway. All this data is public, see SF	Anticipated \$35 million
NYC	Congestion surcharge below 96th street: \$2.50 per trip for yellow cabs, \$2.75 per trip for for-hire vehicles, or \$0.75 per trip if pooled. A cap is also set on TNC drivers at 120,000	-51% to city general fund -45% to state general fund -4% to Metropolitan Transportation Authority	TNCs pay monthly via the Tax Department's Congestion Surcharge Web file application; must electronically transmit records to the Tax Department	In NYC, about 30% of overall traffic was from TNCs, and TNCs were driving without drivers 41% of the time. Link below shows the registered TNC drivers in NYC. <a href="https://data.cityofnewyork.us/Transportation/E">https://data.cityofnewyork.us/Transportation/E</a>	High price elasticity for TNCs, hence the fee hasn't changed behavior much
Denver International Airport	Initially \$2.15 per trip, re-permitted in 2017 to \$2.60 per trip	administration, paving, striping, parking, hold area, port-o-lets	monthly payments, quarterly reports, self-reported and paid through an online finance system	In 2015 there were about 600,000 trips, in 2019 it will exceed 4 million trips. They have about 13,000 pickups/dropoffs per day	About 12.3 million per year based on current fee and trips expected in 2019
New Orleans	\$0.50 per ride originating in the parish	100% to Department of Safety and Permits (enforcement and regulation of ride-hailing and taxi industries, incentives for drivers to choose wheelchair accessible cars	TNC collects and submits quarterly to the Department of Safety and Permits	TNC must provide a list of all employed/contracted TNC drivers to the director of the Department of Safety and Permits	
Portland	\$0.50 per trip	100% Bureau of Transportation	Bureau of Transportation		2016- \$2.3 million; 2017- \$4.4 million

## California



- Formerly 0.33% all TNC revenue, suspended in 2019
- \$0.10 fee per ride recently passed

### Revenue

- 10 cent fee will go towards subsidizing wheelchair accessible TNC vehicles

Currently doing a study on GHG emissions of TNCs under SB 1014, the GHG Reduction Law for TNCs

Since 2014, TNCs have been required to report annually on rides, such as zip code of start and end, trip time and length, and total VMT. Under SB 1014, they will begin reporting more detailed information.



## San Francisco

Will be voting on November on a measure to put a tax on rides originating in the city of San Francisco. The tax was negotiated between TNCs and city officials.

- 3.25% of the fare for a single ride
- 1.5% if the ride is shared or in an EV

Revenue to be used for city transit and transportation safety projects.

Data was collected through a study at Northeastern University that identified the number of TNC trips and their locations.

Anticipated \$35 million annual revenue

Source: San Francisco County Transportation Authority



**Figure 7. Average Weekday Intra-SF TNC Pickups by Travel Analysis Zone**

SOURCE: TNC data



# Chicago



A tax on TNCs has been in place since 2015 and has increased twice, most recently in 2019

- \$0.72 per ride
- \$5.72 per ride to airports/Navy Pier/McCormick Place

Revenue from the 72 cent tax

- \$0.60 to the city general fund
- \$0.02 administrative fee
- \$0.10 to city accessibility fund (conversion of TNCs and taxis to being wheelchair accessible)

Chicago collects and publishes data on TNC rides, including distance, time, cost, whether ridesharing was authorized, and more.

Anticipated revenue of \$30 million in 2019

## New York City

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Formerly collected 8.875% of TNC fare, but changed to a tiered congestion surcharge as of January 2019. Rides below 96<sup>th</sup> street are subject to the surcharge:

- \$2.50 per ride for yellow cabs
- \$2.75 per ride for other for-hire vehicles
- \$0.75 per ride if pooled

Revenue from the surcharge goes to

- 51% to the city's general fund
- 45% to the state's general fund
- 4% to the Metropolitan Transportation Authority

Additionally, there is a cap on TNC drivers at 120,000, though drivers of EVs are exempt.

More TNC drivers in NYC are full-time than elsewhere.

About 30% of overall traffic in NYC was from TNCs, and TNC drivers were without passengers about 41% of the time.



Source: NYC DOT



# Denver International Airport

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Started permitting in 2014 with a \$2.15 per trip charge. In 2017, this was raised to a \$2.60 per trip charge. These numbers were negotiated with TNCs.

Revenue covers administrative costs and infrastructure costs (paving, striping, port-o-lets). The charge was raised in 2017 to pay for the new hold area that was built for TNCs.

DIA sees about 13,000 TNC trips daily. In 2015, DIA saw approximately 600,000 TNC trips total. In 2019, trips will exceed 4 million.

Revenue for 2019 is projected to be around \$12.3 million.

Source: Denver International Airport



## Washington D.C.

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6% of total fare taxed

Revenue goes to

- 17% to the Department of For-Hire Vehicles
- 83% to Washington Metropolitan Area Transit Authority

In 2018, began requiring TNCs to report data on rides, such as pickup/drop-off locations, trip distance, whether a shared ride was requested, whether a WAV was requested, and whether the ride was matched or not.

Studies are being conducted on equity impacts of TNCs, impacts of TNCs on transit ridership, shared ridership patterns, and more.



Source: DDOT



## Literature Review: Colorado State University

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Dr. Erika Miller, PhD

Location where you can access report and references:

[https://drive.google.com/drive/folders/1iGKK-f\\_GW6JQJ3DNUDDQwpeNBtzo2DO-](https://drive.google.com/drive/folders/1iGKK-f_GW6JQJ3DNUDDQwpeNBtzo2DO-)



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## Public Comment Period

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Jonathan Bartsch, CDR



# Action Items for Sub-Committees

Develop action items during discussion at meeting

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.



## Round Table and Wrap Up

Jonathan Bartsch, CDR



# Literature Review for SB-19-239: Update 2

---

Erika Miller, PhD

Somayeh Aliebrahimi, Graduate Student  
Systems Engineering & Mechanical Engineering  
Colorado State University



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# Overview

*Potential **impacts of new and emerging technologies** and business models on transportation system*

- Increasing passengers per trip
- Fee structures
- Adoption of zero-emissions vehicles
- Transportation Network Companies

□ Today: Common trends across these topics



# TNCs Across US <sup>1</sup>

- Fehr & Peers consultant on behalf of Uber and Lyft
  - Combined vehicle miles traveled compared to total VMT in six cities in September 2018
  - “The results show that while they are vastly out-stripped by personal and commercial vehicles, Uber and Lyft are still responsible for significant shares of VMT in those cities.”

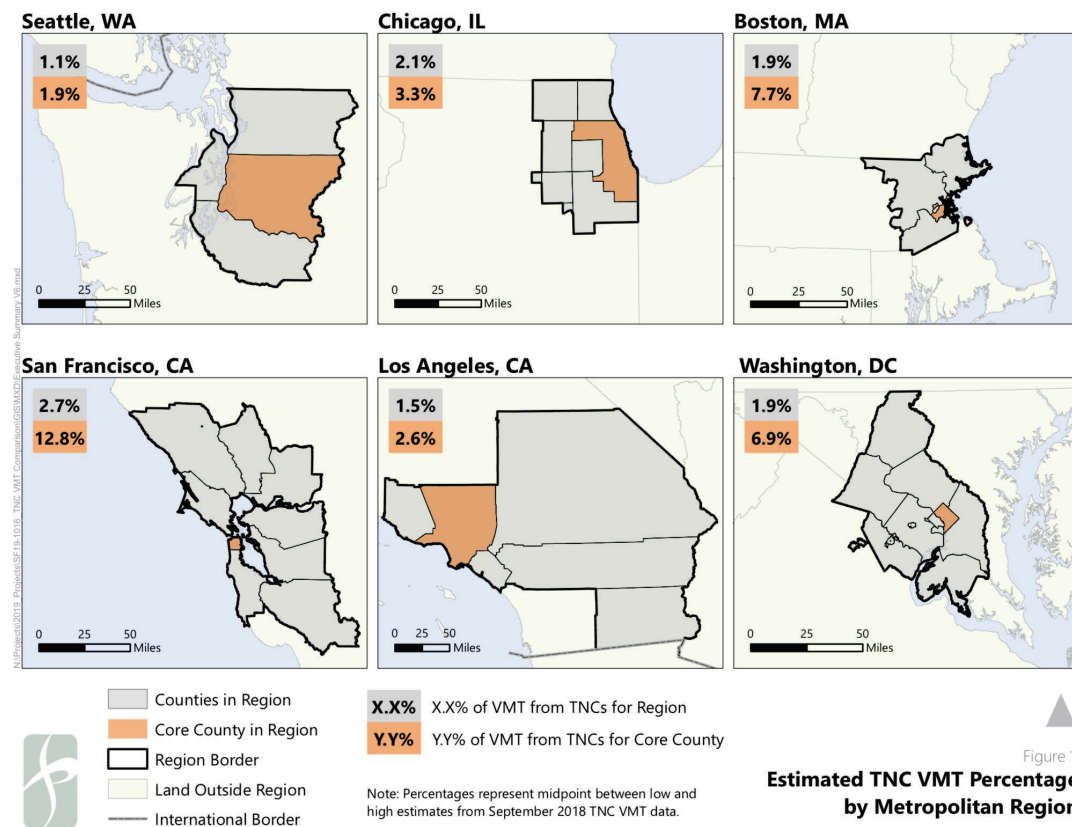


Figure 1

# TNCs Across US

- Lyft Across US: <sup>2</sup>

- 35% of users do not own or lease a personal vehicle
- 50% of those say they are likely to purchase one if services become unavailable

- Lyft in Colorado: <sup>2</sup>

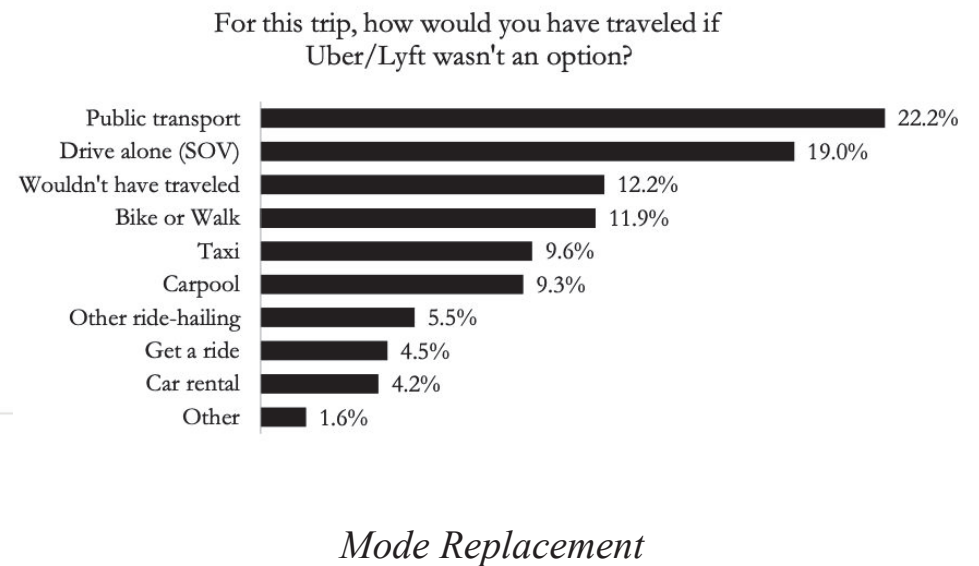
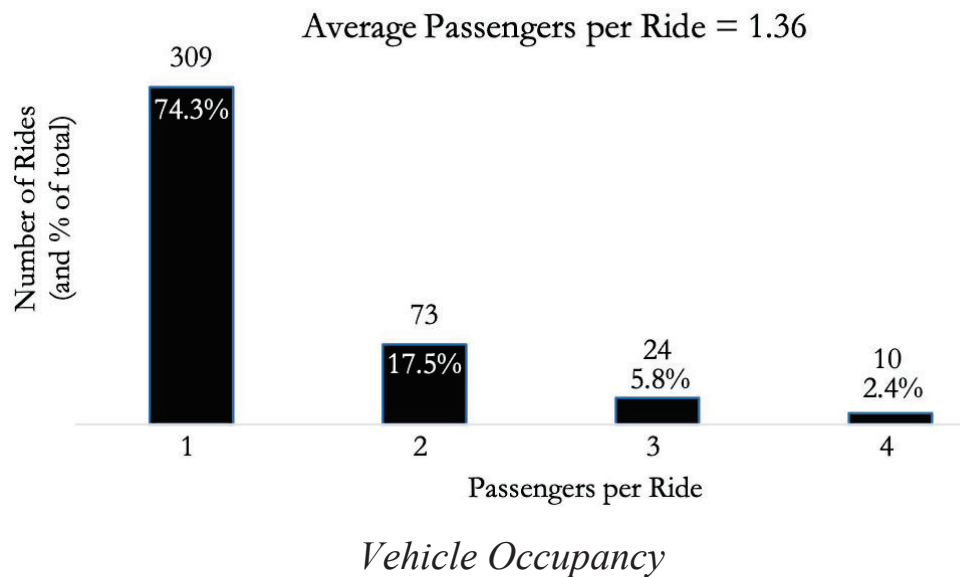
- 23% of riders take Lyft to get around when public transit does not operate
- Late night rides account for 11% of rides
- 54% of rides begin or end in low-income/underserved areas

- Lyft in Colorado: <sup>3</sup>

- 40% of riders are more likely to attend community events as a result of using Lyft
- 27% of healthcare riders state that without Lyft they would be less likely to make it to their appointments regularly
- 11% of Lyft drivers are veterans
- 27% of Lyft drivers are over age 50

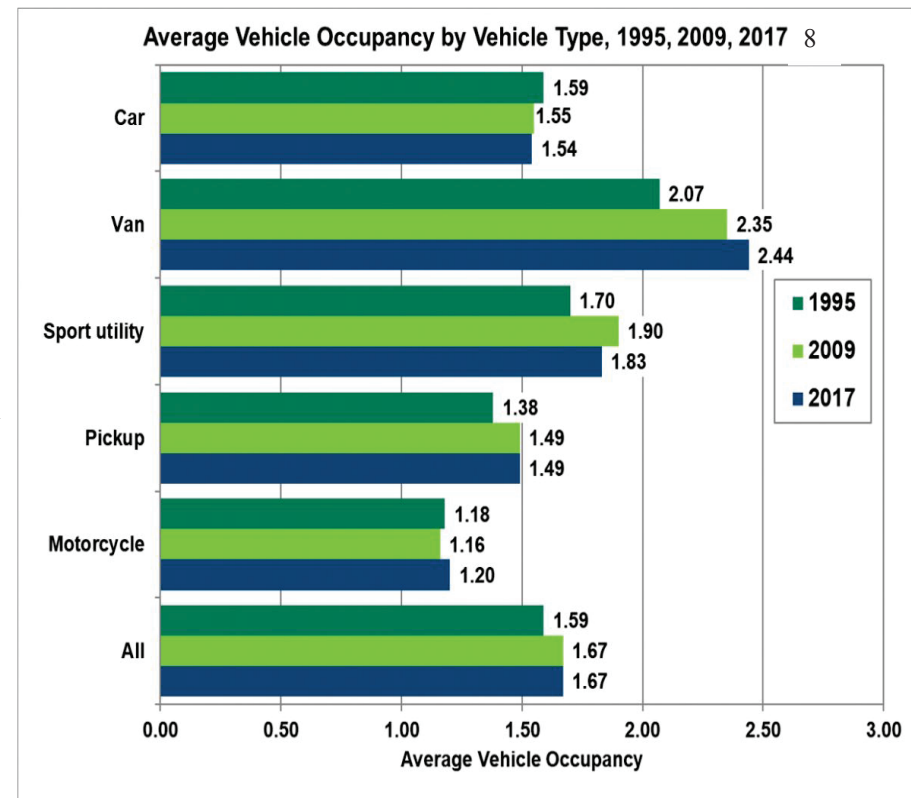
# TNCs in Denver <sup>4</sup>

- Study with 416 participants
- Almost 75% of fares had only 1 passenger



# Travel Behavior

- Average person in US took 2.8 trips per day in 2018 <sup>5</sup>
- In 2016, 76.6% of workers in US commuted by driving alone, and only 9.0% of workers carpooled (a drop from 19.7% in 1980) <sup>6</sup>
- A case for equality <sup>7</sup>
  - Lower-income individuals typically spend a much larger portion of their income on fuel taxes than wealthier individuals do
  - Fuel efficiency has improved markedly over the past four decades, but total motor fuel consumption has remained stable since 2005
  - Electric and other alternative fuel vehicles have become common in the US



# EV Penetration

- In the US, transport sector responsible for 29% of GHG emissions, with 59% from light duty vehicles <sup>9</sup>
- 55% of all new car sales and 33% of global feet projected to be electric by 2040 <sup>10</sup>
  - If plug-in electric vehicles make up at least 40% of new vehicle sales globally by 2040, will cause GHG to stabilize at 450 ppm <sup>11</sup>
- Several states considering creating new transportation funds, such as: <sup>12</sup>
  - Road usage charge
  - Tolling
  - Fees and taxes for vehicles that do not use gasoline



# Incentivize

- Public-private partnerships in transit (e.g., Transportation network Companies, first last mile) <sup>13</sup>
- ZEVs: <sup>14</sup>
  - State rebates, sales tax credits, and other tax exemptions
  - HOV lane access regardless of number of passengers
  - Toll reduction
  - Preferential parking and reduced parking fees
- Average EV will cost \$6k more than a gasoline vehicle in 2023 <sup>15</sup>
- Cost of gasoline fuel is 2.5 times higher than electric fuel <sup>15</sup>

# Fee Structures

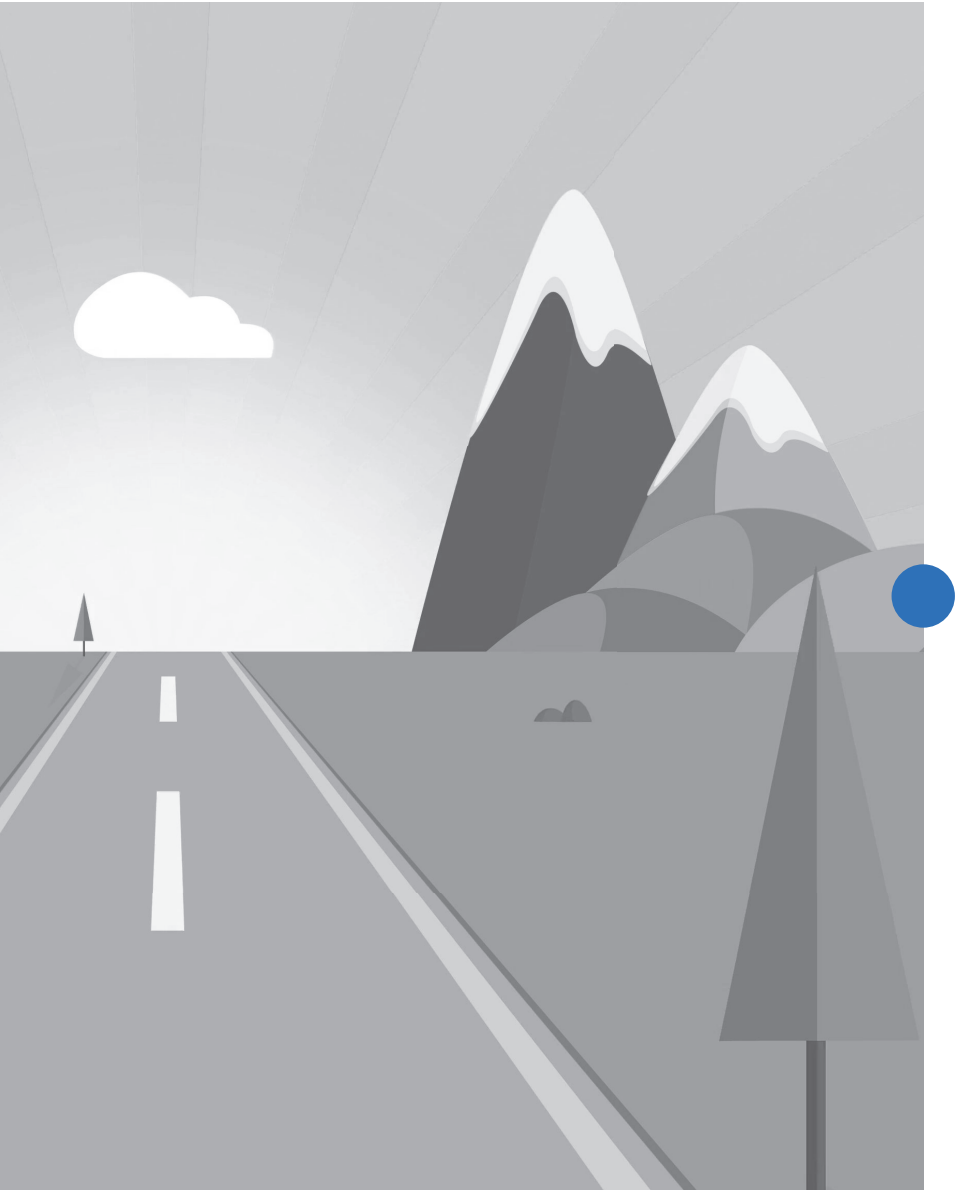
- Congestion Pricing <sup>16</sup>
  - Variably priced lanes or tolls on entire roadways
  - [Variable and fixed] cordon charges
  - Area wide charges
- Road usage charges (DE, WA, OR, CA, CO) <sup>17</sup>
  - Adjusted based on vehicle weight, road type, time-of-day to better reflect the actual costs of transportation system <sup>18</sup>
- TNC fees/taxes <sup>19</sup>
  - Per ride: Chicago, New Orleans, NYC, Portland, King County, Seattle, Tacoma, Washington DC, Brunswick, Massachusetts
  - Percent of total fare: Philadelphia, Alabama, Connecticut, Nevada, New York, Rhode island, South Carolina, South Dakota, Wyoming
  - Percent of total revenue: California



# Case Study: New York City <sup>20</sup>

- NY State DOT to reduce single-occupancy vehicles
- Generate mass awareness of alternative commuting options
  - Launched innovative media and outreach campaigns to visualize environmental benefits, cost-effectiveness, and availability of rideshare/mobility services
- Results of 511NYRideshare since 2010
  - Consolidated 3.7 million single-occupancy vehicles off the road
  - Reduced traffic by 20%
  - 12,100 tons of CO2 reduced
  - 201,560 commuters connected





# Thank you!

Erika Miller, PhD

[erika.miller@colostate.edu](mailto:erika.miller@colostate.edu)



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**University**



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APPENDIX B

WORKING GROUP MEMBERSHIP AND MATERIALS

**SWG Meeting 3 Notes  
and Presentation  
September 26, 2019**



**Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**  
**Meeting #3 September 26, 2019 9:00 am- 12:00 pm**  
**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**



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## Attendance

Adam Zarrin, Governor's Office  
Avery Turman Capstone Group LLC.  
Bruce Abel, RTD  
Celeste Stragand, Ford Mobility  
Christopher Primus, HDR  
David Spector, KPMG  
Diego Lopez, NCCC  
Doug Rex, DRCOG  
Dustin Wiegl, NREL  
Elise Jones, Boulder County  
Emily Lindesy, DRCOG  
George Twigg, Boulder County Commissioners  
Office  
Greg Fulton, FAC  
Jeff Cleland, Amazon  
Jake Swanton, Lyft  
Jenny Alder, DOR/DMV  
Jim Moody, Colorado Contractors Association  
Jonathan Bartsch, CDR and Associated  
Joshua Sperling, NREL  
Julie McKenna, Colorado State University  
Kate Williams, DRCOG  
Krista Flynt, CDOT  
Lisa Streisfeld, CDOT  
Lily Lizarraga, CDOT  
Lou Davenport, Iron Stride Solutions

Manolo Platin Morales, Drift  
Maria Eisemann, CEO  
Mary Marchun, The Capstone Group LLC  
Matt Frommer, SWEEP  
Meegan Wood-Trombley, Enterprise  
Melissa Rary, CDR and Associates  
Michele Scheuerman, CDOT  
Morgan Cullen, CML  
Nick Farber, HPTE  
Peggi Oklye, Amazon  
Piper Overstreet-White, Uber  
RJ Harrington, National Car Charging  
Robert Williams, Orrick Law Firm, Getaround,  
Scott McCarey, Boulder County  
Shoshana Lew, CDOT  
Simon Logan, HPTE  
Sophie Shulman, CDOT  
Stanley Young, NREL  
Steven Douglas, Auto Alliance  
Suzette Mallette, NFRMPO  
Sydney Lund, CDOT  
Timothy Kirby, CDOT  
Totsy Rees, Enterprise  
Travis Madsen, SWEEP  
Will Toor, CEO

## Item 1: Introductions and Updates (CDR)

### Welcome and introductions

Stakeholder working group was welcomed by Jonathan Bartsch.

### Adoption of Meeting Notes from August 19, 2019 (See Attachment)

The meeting notes were adopted.

### Updated project schedule

### Draft Report Outline

Jonathan Bartsch - Legislation required that we make recommendations. Looking to the stakeholder working group with decisions on the recommendations we will be giving. Remember that a full



**Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**  
**Meeting #3 September 26, 2019 9:00 am- 12:00 pm**  
**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

agreement is not expected or anticipated. In the end we want to make sure to capture differing perspectives in order to provide this information to the legislature. Today we will receive a literature review, an update on the fee structure, talk about modeling efforts, and craft a recommendation on fee structures. Additionally, we will examine health requirement certification, along with getting the working groups opinion on this topic.

## **Item 2: Literature Review (Ashley Nylen, CDOT)**

### **Literature Review Updates**

Ashley Nylen gave an update on the literature review from Dr. Miller. The update included:

- Regarding peer to peer car sharing, the research shows that deployments started 20 years ago, the newest one in Colorado started in Boulder. Several models emerged taking ownership from consumer to the Original Equipment Manufacturer (OEM).
- Many cities have an active peer car to car share legislation. Rental cars are expected to grow by 0.6% in the next few years.
- Many cities and states have a fee around rental cars via bookings or another type of fee.
- Recommendation is to take a look at the literature review and the appendices for literature reviews.
- Thank you to Colorado State University for conducting this literature review.

### **Respond to questions**

No comments on this section were made.

## **Item 3: State and City Inventory of Fee Structures (Lily Lizarraga, CDOT & S Curve)**

### **Update on Fee Structures in Other Cities and States for Taxi, TNC, Rental Car, Peer Car Share, Non-Peer Car Share and Residential Delivery**

#### **State and City Inventory of Fee Structure**

Sophie Shulman - Discussed the schedule that we need to deliver the report to the legislature. Today we are talking about the fee structures and modeling effort. We have one more full committee meeting to provide feedback before the recommendation is made to the legislature. We have scheduled a webinar before November 1st. When the recommendation is submitted, this is not the end of the conversation. In January, there will be a public hearing about this legislation. I appreciate the time that everyone has put into this effort and will continue to put in over the next couple of months.

Jonathan Bartsch - We have also been doing an inventory of state and municipal fee structures. You have seen and been provided the draft regarding that.

Lily Lizarraga - We sent out a Google link this morning with today's update on the state and city inventory fee structures, along with a PDF version of the updated TNC state document. With the help of S Curve strategies, we have updated these documents with state and nation wide EV incentives. This shows different fees from across the state. You can see the two dollar fee per day in Colorado on the receipts presented for rental car companies. Photos also show the fees on a TNC trip from New York to

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New Jersey, when you drive across a certain bridge. We looked at fees from across the country related to TNCs and taxis.

## **Item 4: Health Certificate Requirements (CDR & Ashley Nysten, CDOT)**

### **Review Requirements for Drivers**

Jonathan Bartsch - We have not had this conversation in the sub-committee yet. What we want to do is to get the impact and consideration from the stakeholder working group.

Ashley Nysten - This is based off of the conversations within the Safety sub-committee. The medical requirements for TNC drivers differ across the state by different modes. We focused the table on driver requirements and you can see the difference between each. We know that there might not be equal comparison on this data. These medical requirements show if the driver is medically fit to drive.

Jonathan Bartsch- Please look over the document and ask questions and then provide feedback regarding the medical certificate.

Jake Swanton - This medical requirement only applies to Lyft and Uber in different ways. From Lyft's point of view, regarding the medical certificate requirement, is that Colorado is the only state in the country that requires drivers to obtain a medical certificate from a medical provider in order to drive a TNC. The other two places that require this medical certification are in self administered tests for people to say that they are medically fit to drive. I think the reason why we have this is because we were one of the first states to adopt TNCs. Is there a problem we are trying to solve by having this medical certificate requirement? The impacts of the requirement are great. In Colorado, Lyft pays for a nurse practitioner in Denver. However, elsewhere in the state, we do not have the resources to pay for a nurse to do this work. We see driver onboarding (in time) at two to three times higher in Denver than compared to other rural areas of the state. Compared to the country, we see half of the drivers in Colorado urban areas compared to rural areas throughout the state. For us, there is no documented safety benefits by having this document. But, there are big impacts on the drivers

Piper Overstreet-White - Thank you Jake. Yes, this requirement is very unique to Colorado.

Jonathan Bartsch - What problem is this requirement trying to solve?

Jake Swanton- From Lyft and Uber's viewpoint, the medical requirement limits drivers in urban areas. Our drivers are not professional. Over 90% of drivers drive less than 20 hours a week. The state of Colorado has already certificated people to drive through a vision test. The process could not even be requiring alimments. The person could easily fill out this form without the help of a medical provider.

David Spector - When the TNC regulation and legislation was adopted, the health certificate was very well discussed. This is something that has been talked about robustly. Therefore, there is a lot of information on this from the legislature

Jonathan Bartsch - That is a good point. The legislation within SB 19- 239 has asked us to reexamine this.

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**SWG recommendation to include in the report**

Greg Fulton - When we look at safety, we look at insurance providers. When we look at Amazon or Fedex, the requirements are subject depending on the size of the vehicle and they are subject to state regulations. Companies are also doing random drug and alcohol test on individuals. Carriers have policies that ban drivers of trucks over 26,000 pounds from using a handheld phone. There are a number of these elements within that category regarding the regulations. This costs more for the company to operate, but they do it because they think it is safer for their operations.

Lou Davenport - What is the point of the legislature regarding the medical background checks? Our committee in general or Charles Meyer can add something. We do not have enough information in our group to make a strong argument or case one way or the other. We need more data on how something like the medical fitness test actually impacts safety. We also need to compare more than just that. We need to address handheld devices and other elements that are impacting safety. We need to look at this holistically on what adds to safety. Our committee can't make a recommendation other than to study other things in the future.

Jonathan Bartsch - What I am hearing is the desire of the Safety Sub-committee to study and look further into the impact of the state regulation. We do not have enough information and we need to have this information in order to make an informed decision.

Lou Davenport - What do we need in order to make a better informed decision? We do not want to do something that inhibits companies ability to compete in the market. No one mode should have an advantage based on the recommendation that we make.

Will Toor- I have a question about the availability of data around the impact of the medical requirement. Is there information in the record where they debated this using information from the early state within the legislation? Have we been able to find information from the legislative record in other states?

Ashley Nylen - We have not heard from other states about their records. We have asked Lyft and Uber for data on the medical requirements impacting drivers ability to drive. We are happy to collect other data.

Jake Swanton - With regards to other states and cities, only Honolulu, Hawaii and the state of Kentucky have this medical requirement. We have not gone back to see the conversation within the legislature regarding why this was required. We have received Ashley's request to ask about this. We do not have much data because all Lyft drivers in Colorado need to have that medical certificate in order to drive.

Kate Williams - When you are looking at safety, we need to look at overall safety. Many people have either Lyft or Uber rides as their only modal option. If there are less Uber and Lyft drivers due to this required medical certificate, it can damage the quality of life for those people who depend on this transportation as a whole. We are trying to help TNCs get more drivers in rural areas in order to help older people have access to modal options.

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Jonathan Bartsch - What was the conclusion from this group?

Jake Swanton - If this group is working to make Colorado a better place as a whole, then we should allow the requirements that are similar to other states. Having a very basic medical visit in Denver is fine, but the rest of the state this is not, due to lack of health care or medical care opportunities.

Jeff Cleeland - While we are examining that the medical requirement might be too much for a TNC, there should be something a little harder to get than just signing up. It should be a little more monitored.

Bruce Abel - I think it might seem easy to look at requirements as overkill. We should not look at the Commercial Drivers License (CDL) requirements as being a guideline. I think something over and above what is needed to get a driver's license is necessary.

Jonathan Bartsch - What I am hearing is that we need to have something that is more than drivers license, less than CDL license.

Jake Swanton - Yes, we are also agreeing to remove the barriers for drivers.

Lou Davenport - We need to get more data on benefits. Regarding rural Colorado, we need more data on how TNCs have impacted impaired driving might play towards the case. We don't have data on late night trips.

Sophie Shulman - Do we have data on the impacts of DUIs?

Jake Swanton - We can provide that data, but it is not specific to Colorado.

Greg Fulton - We may need a different drivers licenses and subject to a different test to be able to drive, in addition to drug and alcohol tests. Overall we could create a safer environment, regarding something we have policy and requirements from the federal level.

Lisa Streisfeld - One piece of data to look at is TNC crash rates in other states that do not have a health certificate to compare to the crash rates in other states that do have the medical requirements. Would Lyft or Uber be willing to provide us with that information? If the crash rate is the same in Colorado and other states, then this medical certificate is not providing any more safety. The second piece of information that would help us is how many drivers are turned away from not meeting the health requirements. We do not know this information. That is why the sub-committees are having a hard time making a recommendation.

Jake Swanton - On the latter topic, the medical certificate is a form that is signed. We are not able to see the turn away rate. We have been trying to figure this out to show that this medical requirement is having an impact.

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Lisa Streisfeld - How does Colorado compare to the other states?

Jake Swanton - We also need to compare Colorado to other similar states.

Sophie Shulman - Do you have data from people who are turned away from the medical requirements process?

Jake Swanton - No.

Jonathan Bartsch - What I heard is a desire to look beyond the license requirement that would promote safety. The concern about the impact to access TNCs in rural areas as a result of the medical requirements. Also, we would like to look and consider the available data which is the track record of the discussion that we have had so far. Any other stakeholder working group comments on your perspective on this issue?

No other comments were made from the attendees in the room or on the phone.

## **Item 5: Modeling (Chris Primus, HDR and CS)**

[Modeling data, assumptions, methods](#)

[Vehicle Miles Traveled](#)

[Emissions Generation](#)

Christopher Primus - We are looking at preliminary results that we have come up with so far. We are looking at estimates of impact on certain providers along with the 2017 baseline numbers from today. As we speak, we are working on 2030 numbers. The focus of the modeling is on the six providers from the legislation. We have updated the language of these six providers to make them more consistent overall.

The primary tool that we have is the CDOT Statewide Travel Demand Model called State Focus. Travel demand turned this tool into trips that travel across different networks. One output is roadway miles. An activity-based active model that is sophisticated as this one has a variety of features and outputs that identify different types of travel. This model includes cars, trucks, and TNCs and different modes, like transit.

A couple of quick snapshots of some of Colorado's statewide transportation were provided. The model shows the highway and transit networks from throughout the state as well as transit routes. The model also looks at daily values of VMTs on the roadways by type. For five of the six providers, it does not include these directly. For the other providers, we are using an off-model approach and spreadsheets to estimate the number of trips and trip lengths. The primary effort is to look and search for data around the type and nature of the trips by these providers. We have made inquiries to local providers requesting their data. The non-disclosure concerns have been heard and CDOT is working to address those. The request is expected to be returned to the providers with an updated request in a few days.

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David Spector - Are you going to provide an overview of the data into the Statewide transportation model?

Christopher Primus - We are folding this into the Statewide numbers. More information was provided about data sources including household travel surveys, other surveys included driver surveys, published studies, and aggregate data from Chicago and NYC TNC data. We are looking to get more Colorado-based state data as much as we can.

Doug Rex - Is the TNC data incorporated into the Statewide model?

Christopher Primus - CDOT has been working on incorporation that as a new feature. This was prior to the inception of the study.

Doug Rex - DRCOG has data source based on surveys and other data elements from around the country.

Christopher Primus - Emissions models take VMTs into consideration. This is focused just on the transportation sector, not on other sections that are emitters. There is a webinar for the working group scheduled for October 15th. During the webinar, we will explain the initial assumptions for each of the providers. On that webinar, we will explore this in detail. Another topic of the webinar that is changing is the results of scenario testing and imposing fees on these companies to test emissions and trip usage.

Early results for the baseline VMT estimates were discussed. We want to get your reactions from the slides. For Colorado, all personal travel equates to 20,065,000 trips daily (personal travel only) and VMT daily is 124,741,000 miles. This is looking at VMT per day per residential travel. For 2017, there were five to six million people within Colorado. Data from the slide "Baseline VMT Estimate Today" was discussed with the stakeholder group. Being a transportation planner, I think that the number of average trips being 3.6 trips a day per person is a reasonable number. Midpoint is 50,000 TNCs trips per day, with about a 10 mile average per trip. This equated to between 500,000-600,000 VMT per day for TNCs. We would like to get the VMAs reactions to these numbers to gauge the accuracy.

Lou Davenport - Why is the car rentals VMT much higher than TNCs?

Christopher Primus - People are using TNCs for shorter trips while the car rentals might be for longer trips.

Meegan Wood-Trombley – 70% of our car rentals (Enterprise) are for replacements. So your data is too weighted for visitor trips, and the VMT associated with car rentals should be less

Celeste Stagand - It looks like there is less than 1% of VMTs are related to TNCs. That is a very small number. What are we trying to solve with this fee? We are focusing a lot of energy looking at something very small. What is the insight into the larger goal of the Senate Bill?

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Jonathan Bartsch - Your reactions is why are we focusing on this small number?

Celeste Stagand - Yes

Sophie Shulman - We are not just looking at TNCs, but other emerging technologies and companies. I can't speak on anything other than what we are tasked with under SB 19-239. We are tasked with emerging mobility within the legislation. The 2030 baseline is how these changes are predicted to change our transportation system and how we will mitigate the impacts. We are not going to spend too much time on the money and fee aspect, since that will be discussed by the legislature.

Lou Davenport - Is it correct to say that in general if any funding or fee comes out it is solely to mitigate the impacts of these emerging technologies? The fee has nothing to do with bigger transportation funding?

Sophie Shulman - SB 19-239 specifically calls out infrastructure to support multimodal options and zero emission vehicles.

Will Toor - One other question is if we look specifically at more congested areas, how do these numbers change?

Christopher Primus - We will probably look at MPO areas.

Will Toor - If we are looking at congested periods in our metro area, this might be higher in the metro area than throughout the rest of the state.

Bruce Abel - I just wanted to follow up on Will's comment about trip distance. Somewhere in the data and models are you using an assumption of average trip length than that date be called out special from TNC taxis and car share? I am sure that the companies have this data. Are there different trip lengths within different parts of the county?

Christopher Primus - We will provide our assumptions of the average trip lengths at the Webinar.

Lisa Steinfeld -For example, the number of TNC trips at Denver International Airport is approximately 13,000 per day.

Travis Madsen - Companies could introduce automated vehicles in the roadways in the next 10 years. This could increase the total TNCs drastically. We need to look at social and environmental goals.

Christopher Primus - We are looking at an increase of percentage shared.

Jake Swanton - Looking at 2030 given than our company has aligned goals with transportation as a service. We would love to see automated vehicles on the road in order to better manage roads and



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VMT. When looking at airports for a proxy for other parts of the state, we think about it much differently than getting around different parts of the states.

Christopher Primus - Offered a quick look at associated emissions estimated. Falls in line with VMT for the state total. The correct number for taxis is 49 tons of CO<sub>2</sub>e per day. State total is much closer to VMT should be 3.5% for the providers. CO<sub>2</sub> equalization tons are shown in another chart.

Greg Fulton - There is a trade-off with residential delivery? For example, you have five items coming from Amazon means that the customer does not need to take a trip to the store. Do we have something showing that bundling packaged would reduce VMTs?

Christopher Primus - Deliveries are not actually trips - they are the number of deliveries and not just trips taken. You notice that the VMT is similar to the number of deliveries. The distribution trucks go from the distribution warehouse into neighborhoods and make multiple trips within this area.

Greg Fulton - If I go to five different stores to get the five things, that is more VMTs than if the carrier brought all five things to your house in one delivery. The carriers usually have better vehicles than residents, which is better on emissions.

Lou Davenport - This is such a small percentage. If the big picture goal of the study is to promote electrification and other CO<sub>2</sub> reduction emission technologies, the percentage in this table compared to the other TNC needs to be much higher. What will the transition into TNCs be from now to 2030? If it is not a big increase, then maybe we are focusing on the wrong thing.

Sophie Shulman - CDOT and CEO are working on a lot of other efforts to provide VMT reductions and support zero emission vehicles. Even though we are spending a lot of time on this, we are doing a lot of other work in those areas as well.

## **Item 6: Freight Advisory Council (Greg Fulton)**

### **Role of FAC**

Greg Fulton - We are coming together to establish recommendations and policies to advance freight movement within the state. In SB 19-239, we are charged to give some recommendations. This is a very growing business out there. It is very focused on healthcare and medical distribution. A lot of people receive medical supplies through the mail, and this is especially important for elderly people who do not have the ability to drive. This is also important for young people who do not choose to have a vehicle. Residential delivery is a mature industry for us. Home delivery has been going on for well over 100 years. People focus a lot on the Amazon side of delivery, however there are a host of other folks and companies that go into the home delivery process.

When we talk about fees there are a number of fees embedded into this. Here are a host of fees and even local fees. In terms of drug or alcohol testing and high insurance, these are embedded into this process. If your entire business is in transportation, then you will become more efficient. The costs are slim, at only 4%. We have route optimization software. One half of the

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delivery costs are associated with the last half mile of the delivery. Home delivery companies and the smart EPA program tracks emission reductions. We assume that these deliveries are adding additional VMT onto the roads. The reality is, in some cases, these home deliveries result in less VMT..

One way to help reduce VMTs and emissions is to work with customer behavior. If people bundle their packages, then it will be more efficient for customers, because delivery companies can bundle these packages. We are doing various initiatives to reduce VMT. We do not want our delivery drivers to be in that congestion. We want to reduce VMT to reduce our carbon footprint, because the costs motivates us to do this. We also are supporting the availability of delivery parking. With the large apartment complexes and offices in downtown spaces, parking is limited. We are going to need more delivery drop off zones, if there are less parking spaces available. We are looking into electrification and drones. We welcome any incentives and we are an industry that is monitored. We are an EPA smart member and that is a successful program from the EPA. Delivery in Colorado is a fast and growing market, but it also cuts back VMTs. The Freight Advisory Council is tasked to look at this information. We are working on the last mile and looking to this group for how we go about this. I am happy to answer any questions.

Jonathan Bartsch - Part of the recommendation is to receive information from the Freight Advisory Council.

Greg Fulton - We have a monthly meeting. We have discussed the elements on this and this is a short window to come up with the recommendation on this. The reality is that we don't want to have an impact on seniors or other adverse effects within this process. We do have some other ideas we can bring further. We are working on this and are happy to provide any other information on this

#### [Recommendations for Study](#)

No questions were asked.

### [Item 7: Sub-Committees Compiled Draft Recommendations \(CDOT\)](#)

- [a. Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs](#)
- [b. Natural Environment Impact and Emissions Analysis](#)
- [c. Congestion Management: Incentivize Shared Ridership and New Mobility](#)
- [d. Social Impact and Equity Analysis](#)
- [e. Safety](#)
- [f. Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies](#)

Ashely Nylen - These recommendations are drafts. We wanted the committee to discuss what is discussed in the sub-committees. Please note if anything was displayed incorrectly. This is in the Google folder online and also in front of everyone.

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Jonathan Bartsch - We want to give a few moments for people to review the draft recommendations. We want to know if anything is misrepresented and secondly we want to get feedback or concerns on the substance of the content.

Five minutes were given to the sub-committee group to review the information and to talk with a neighbor.

Will Toor - The set in the congestion management area seem like general TDM recommendations instead of focusing on the emerging mobility options on the Senate Bill.

Jonathan Bartsch - I think that these might be a little more general for congestion management.

Bruce Abel - Would it be appropriate to add that one of our recommendations would be fees directly linked to setting off impact of congressional air quality fees? Could fees offset negative impacts, by promoting and providing carpooling?

Jonathan Bartsch - With the offsetting, we might be able to offer offsets to employers who incentives this.

Will Toor - Was there any discussion within the shared group to incentive these shared platforms?

Jonathan Bartsch - One question was how can companies promote shared ridership. We want to evaluate the recommendations at a high level. What are we looking for at a high level?

Will Toor - Interested to see that this will be an area where the revenue generated would be approved to go into TDM programs. Also think about incentivising multiple passenger trips within the fees.

David Spector - When you look at congestion management as a sub-committee and stand alone, we are trying to take the things that we broke out back up to a different and bigger umbrella. There are question and pull factors. One fee might help with congestion management and might not help on social and equality side. How do we go from stand alone recommendations to the bigger level? Some of these recommendations might accomplish one goal but at the fault of others.

Jonathan Bartsch - After this, the sub-committee will go into more depth on this to incentive and think about different recommendations. A lot of work has gone into this up to this point. How does everything fit together to come to a certain set of recommendations? To be determined is where these nominations go together as a sum.

Sophie Shulman - I don't think that a fee structure will solve all the problems and concerns. This provides a framework to evaluate what fee structures will meet the intent of the legislation.

Elise Jones - Do we have to prioritize which principles are more important? Or can we have a different fee structure?

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Jonathan Bartsch - Given that the fees need to be rolled together, are there concerns on the individual level of these? What red flags and concerns are seen? We need to integrate and share as regulations to the fee structure.

Lou Davenport - Inconsistency of the fee structure and how we will charge a fee. What data do we need to have is the priorities. Some fees are focused on who should and should not be changed while others talk about how the money should be spent.

Matt Frommer - This is not the holistic version of the recommendation, but just the fee.

Bruce Abel - It would be important to address sub-committee recommendations. We did have a conversation about how to use fee structures to incentive shared rides. Fee structures should allow for the incentives of shared rides. If a fee is imposed, it should not eliminate share rides.

Sophie Shulman - I like Matt's suggestion of the recommendations to separate the fees and where the fees go. We should try to get to some categories, if possible.

Jake Swanton - Is this a complete list? Is it helpful to incentivize 40-50 MPG (miles per gallon) vehicles as we get to EVs?

Jonathan Bartsch - It is not just all about EV, but EV light.

Lisa Streisfeld- I wanted to get to Sophie's point. This is just a summary of the outcomes so far. We wanted to hit all of the goals set within SB 19-239. Each group will have a memorandum of all of the recommendations to be provided to the stakeholders. This would provide a good stage as we look into the fee structures. We wanted to give a sense of what has happened in the initial meetings and sub-committee meetings, and then bring that together. You have been given access to each of the sub-committee materials so that everyone can see all of the information that each of the sub-committees are provided. The Social and Equity Sub-Committee did a gap analysis and looked at transit needs based on the census and what different providers are offered within these different regions. You can see some regions do not have mobility options. For providers, if we have something wrong, please let us know. There are some mobility options available within the state and some areas which do not have access to these different mobility providers.

Greg Fulton - When we look at fees, we look at efficiency of the fees. I caution if we look at a fee for vehicle miles that is very complicated to calculate. How do we make sure we don't have a tremendous amount of authority of these fees? Where is the low, medium, and high income assessed for packages? If this is a self definition, is it by who ordered the package or where the package is coming from?

Travis Madsen - Natural Environment Impact and Emissions Analysis Sub-Committee - We did not think about how hard this fee would be to implement. It should be structured to reduce emissions and to

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increase shared ridership. We should look at the fee structure to reduce emissions and then see how it is best to spend the money.

## **Item 8: Fee Structure and Exercise (CDR & Nick Farber)**

### **Fee Structure Alternatives**

### **Fee Schedules**

### **SWG Recommendations**

Nick Farber - Fee Structure Sub-Committee progress - We have discussed research and evaluation of test fees. We went through different areas that we could impose a fee on. Last week we looked at feasibility to implement the fee on government and business. Fees align with the goals of SB 19-239, and we can also module these and assess the outcome of that. We broke down the fees into vehicle type, by the time of day, by location, and by air quality conformity. We then looked at this by peak hour, non peak hour, rural and urban. Feedback was mileage based, fee as a percentage of transaction, and a flat fee. We then looked at how difficult it is for these to be implemented along with the feasibility of implementing the fee. The fee structures were elevated above revenue generation, fragility, and the SB 19-239 goals.

Sophie Shulman - These numbers on the fee suggests key considerations are our initial considerations and are not yet done.

Nick Farber - Residential delivery would have to pay more.

Sophie Shulman- One complication is that for the third recommendation, the fee could be on the mileage of the trip or the total mileage per driver.

Jonathan Bartsch - Is this accurate? Are there other things that we missed? Does anyone have any comments related to the fee structure?

Travis Madsen - Mileage is the most proportionally related to emissions and would have the most impact on emissions emitted per mile.

Nick Farber - We could have different fee structures based on the mileage user fees. Also could be related to what type of vehicle or time of day. We can drill down much deeper on this.

Steve Douglas - Regarding the mileage fee, my interest is VMT but the real focus is emissions and congestion. I think that the mileage fee could fall short on the size of the vehicle or the amount of passengers in the vehicle.

Matt Frommer - On the fee structures we talked about is putting a feasibility into SB 19-239 and the revenue per each of the different transportation providers.

Jonathan Bartsch - Looking at the feasibility per provider.

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Jake Swanton - One example that might be counterintuitive. A company like Uber is more incentivized to have the quickest commute. Maybe if the commute goes a little farther, but goes through an area without congestion, this could save on emissions. Putting a mileage fee would disincentive this feature.

Doug Rex - Does the similar to implement have to do with feasibility and the providers getting a five?

Jonathan Bartsch - Yes, that would be true.

Celeste Stragand - One thing that we addressed is equity, with lower income people living further away from the city center. If a mileage based fee was included, this could put a lot of pressure on these low income folks.

Greg Fulton - Do we count mileage on a private roadways as well? We are sometimes having to circle around a city block three times to find a parking space downtown, because there is no parking. I think that mileage based is a much more difficult fee to impose.

Nick Farber - Discussed the percentage of a mileage based fee, the percentage of transaction fee, and the flat fee. This information was discussed amongst the sub-committee.

Travis Madsen - There is a potential to use the fee to provide a net positive benefit. We need to take a close look to inactive the fee to make sure that this happens.

Shoshana Lew- The last item on the list 'Fee is imposing ...' Can folks talk about the thinking behind this?

Jake Swanton - I am not sure what this is. We want to make sure that no fee is disincentivizing us to bring EVs to the market. Any fee will disincentivize us to bring EVs into our business.

Travis Madsen - If we control the fee on these companies, then we can unlock the efficiency and saving on these.

Shoshana Lew - I am not sure if I agree with that. It is not mutually exclusive. In the regulatory space, we can impose some costs and also impact some technology.

Bruce Abel - Would any of the fees disadvantage rental car companies because they already have a fee? Would any of these fees on emerging mobility providers be a disadvantage because it is a new piece?

Jonathan Bartsch - To clarify what we are doing is summarizing the discussion and getting feedback.

Lou Davenport- Would the mileage disadvantage rentals more? A rental car would have more miles per transition than a TNC.

Meegan Wood-Tromnley - The mileage is a lot harder for the car companies to keep track.

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David Spector - If you're getting a fee from something, then it might be an advantage. Any fee will also bring benefits. The fact that the committee is not designed to talk about how these revenues will be spent, creates a hard connection to where the fees will go. We need to think about where the fees will go toward helping the social good.

Jonathan Bartsch - The last time we had talked about this we said it was hard to have this conversation about fees because we did not know where the fee would go.

David Spector - Maybe this goes into the report to show how it was hard to make the best recommendation with the absence of where the fee goes. This should be a part of the report.

Sophie Shulman - There is some guidance on using this for infrastructure in the SB 19-2239 and how these fees will be used based on the goals provided.

Greg Fulton - If we do it on the purchase itself for deliveries, if it is on the price of the fee or is it from the cost of the delivery. Where is the point of the transition? Does it come back on the rails or in the company that is providing the fee? This is problematic from our side. We have free delivery from Amazon and other places, which would make these fees even more challenging.

Kate Williams - One of the reasons that we have the sub-committee is to look at the feasibility and what the fees goes toward. But we need to look at who provides the TNC rides, who the drivers are, who uses those rides, and the quality of those things. As we move forward, we need to look at the recommendations from various subcommittees and how those recommendations offset each other. I would like all of us to take a look at what goes hand in hand and what cancels each other out.

Steve Douglas - It seems like some of these fees would be hard to accomplish versus how well the fee meets the goals of SB 19-239.

Jonathan Bartsch - We have a poll going around that will show the feasibility of the recommended fees.

Steve Douglas - I am not sure that some of the fees can be broken out by the feasibility and the goals for SB 19-239.

Kristin Sullivan - If we make fee adjustments on the different fees, we could also have a flat fee that is adjusted per the fee.

Elise Jones - What is taken away from the extremely difficult or the relatively difficult. Is the number five on the poll good for achieving the goals or is five simple?

Jonathan Bartsch - The higher the number represents that the fee better accomplishes the goals of the SB 19-239 goals.

Elise Jones - I would suggest making the chart more clear.



**Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**  
**Meeting #3 September 26, 2019 9:00 am- 12:00 pm**  
**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

Steve Douglas - Does a mileage based fee really improve air quality? For example, you could have a Prius with three passengers versus a fee for an SUV with one passenger. If these get the same fees, then how is that equal for air quality improvements?

Shoshana Lew - We need to be thinking about what gets the most bang for the buck and if we are going to be able to practically implement something.

Bruce Abel - Are you looking at the broad category for the trip of the fee and assume that the fee would provide incentives or disincentives for the behavior?

Jonathan Bartsch - Yes, the fee structure would be tailored with categories depending on the fee structure.

Matt Frommer - Why would the transaction fee be any more difficult than the mileage based fee?

[Information obtained from the polled responses](#)

Which fee scenario option is the easiest to administer?

- Mileage based fee
- Percentage of Transaction fee
- Flat fee

What fee structure option best meets the goals and objectives of SB 19-239?

- Mileage based fee
- Percentage of transaction fee
- Flat fee

Jonathan Bartsch - Let's talk about the mileage based fee and how this meets the goals.

Travis Madsen - Similar that this one is the most popular one to emissions and directly related to VMT.

Steve Douglas - Best of those three options.

Kate Williams - I think that what we are seeing is the mileage based fee meeting most of the criteria and motivating people to not drive unnecessary miles.

Jonathan Bartsch - The privacy concerns on tracking miles was heavily raised.

Shoshana Lew - We could easily imagine how any of these could be possible without compromising privacy.

Lou Davenport - Any discussion on the combination?

**Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**  
**Meeting #3 September 26, 2019 9:00 am- 12:00 pm**  
**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

Nick Farber- Yes there was. It can also depend on industries. Might be more reasonable to have a flat fee on one and a mileage fee on another. Combination might be different depending on the industry.

### **Item 9 - Public Comment**

No public comments were made.

### **Item 10 - Next Steps (CDR)**

[Proposed Webinar for October 15<sup>th</sup> to share modeling scenarios of fee structure](#)

Webinar for modeling on the 15th of October from 3:00 - 4:00 p.m..

[Review agenda for SWG meeting #4 on October 24<sup>th</sup>](#)

Subcommittee meetings offer a useful impact to the recommendation to the legislation.

Next scheduled meeting is on Thursday, October 24 from 1:00 - 4:00 p.m. at CDOT HQ/R1.

Jonathan Bartsch - Expect outreach from the team to make sure that we are able to communicate the way we planned. Acknowledged all of the CDOT and Colorado Energy Office putting in all of the work. Thank you to the stakeholders for their participation in this group.

Shoshana Lew - Thank you to everyone for coming to work on this.





# 2019 Emerging Mobility Impact Study Stakeholder Working Group Meeting # 3

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September 26, 2019  
9:00 am to 12:00pm  
CDOT Auditorium  
2829 West Howard Place, Denver, CO 80204





# Agenda



ITEM	TOPIC		TIME
1	Introductions and Updates (CDR)	<ul style="list-style-type: none"><li>• Welcome and introductions</li><li>• Adoption of Meeting Notes from August 19, 2019 (See Attachment)</li><li>• Updated project schedule</li><li>• Draft Report Outline</li></ul>	9:00 to 9:10
2	Literature Review (Ashley Nylen)	<ul style="list-style-type: none"><li>• Review updates to Literature Review</li><li>• Respond to questions</li></ul>	9:10 to 9:20
3	State and City Inventory of Fee Structures (Lily Lizarraga & S Curve)	<ul style="list-style-type: none"><li>• Update on Fee Structures in Other Cities and States for Taxi, TNC, Rental Car, Peer Car Share, Non-Peer Car Share and Residential Delivery</li></ul>	9:20-9:30
4	Health Certificate Requirements (CDR & Ashley Nylen)	<ul style="list-style-type: none"><li>• Review Requirements for Drivers</li><li>• SWG recommendation to include in the report</li></ul>	9:30-9:45
5	Modeling (HDR & CS)	<ul style="list-style-type: none"><li>• Modeling data, assumptions, methods</li><li>• Vehicle Miles Traveled</li><li>• Emissions Generation</li></ul>	9:45 to 10:15



ITEM	TOPIC		TIME
	Break		10:15 to 10:25
6	Freight Advisory Council (Greg Fulton)	<ul style="list-style-type: none"><li>• Role of FAC</li><li>• Recommendations for Study</li></ul>	10:25 to 10:40
7	Sub-Committees Compiled Draft Recommendations (CDOT)	<ul style="list-style-type: none"><li>a. Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs</li><li>b. Natural Environment Impact and Emissions Analysis</li><li>c. Congestion Management: Incentivize Shared Ridership and New Mobility</li><li>d. Social Impact and Equity Analysis</li><li>e. Safety</li><li>f. Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies</li></ul>	10:40 to 11:10
8	Fee Structure and Exercise (CDR & Nick Farber)	<ul style="list-style-type: none"><li>• Fee Structure Alternatives</li><li>• Fee Schedules</li><li>• SWG Recommendations</li></ul>	11:10 to 11:40
9	Public Comment		11:40-11:50
10	Next Steps (CDR)	<ul style="list-style-type: none"><li>• Proposed Webinar for October 15<sup>th</sup> to share modeling scenarios of fee structure</li><li>• Review agenda for SWG meeting #4 on October 24<sup>th</sup>.</li></ul>	11:50-12:00

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## Adoption of Meeting Notes from Second Stakeholder Working Group #2 Meeting on August 19, 2019





# Updated Project Schedule

Stakeholder Working Group Meeting # 1 June 28, 2019  
Develop 6 Sub-Committees, Review Legislation

The project team begins modeling of existing conditions for vehicle miles travels and carbon emissions.

Stakeholder Working Group Meeting #2 August 19, 2019  
Review Fee Structure in Other Agencies, Develop Criteria to Evaluate Alternatives

The project team takes recommendations and ranks against the criteria.

Stakeholder Working Group Meeting #3 September 26, 2019  
Review Health Certificate Requirements and Discuss Recommendations  
Review Fee Structure Options and develop Rates, Discuss Possible Investments

October 15<sup>th</sup>, 2019  
3-4 pm  
Modeling Webinar

The project prepares draft report for Stakeholder Working Group review.

Stakeholder Working Group Meeting #4 October 24, 2019  
Prioritize Recommendations for Final Report Preparation

The project team takes comments and finalizes the report.

Recommendations and Report Due to CDOT November 1, 2019

# Review Draft Report Outline

## CONTENTS

### EXECUTIVE SUMMARY

#### CHAPTER 1. STUDY BACKGROUND

- 1.1 Introduction
- 1.2 The Role of Senate Bill 19-239
- 1.3 Summary of Study Tasks

#### CHAPTER 2. EMERGING BUSINESS MODELS & PROVIDERS

- 2.1 Commercial Transportation Providers
- 2.2 Current Regulations
- 2.3 Current Fee Structures
- 2.4 Current Programs with Emerging Providers
- 2.5 Impact of Emerging Providers on the Way Coloradans Travel
- 2.6 Opportunities to Offset Impacts

#### CHAPTER 3. STUDY PROCESS

- 3.1 Stakeholder Working Group
- 3.2 Subcommittees
- 3.3 Stakeholder Working Group Protocols

#### CHAPTER 4. DATA COLLECTION

- 4.1 CSU Research
- 4.2 Additional Data Collection

#### CHAPTER 5. IMPACT ANALYSIS METHODOLOGY AND ASSUMPTIONS

- 5.1 Overall Approach
- 5.2 TNC
- 5.3 Peer to Peer Car Share
- 5.4 Non Peer to Peer Car Share
- 5.5 Taxis
- 5.6 Car Rentals
- 5.7 Residential Delivery
- 5.8 Summary/Takeaways

#### CHAPTER 6. FINDINGS BY SUBCOMMITTEE

#### CHAPTER 7. STUDY FINDINGS AND RECOMMENDATIONS

- 8.1 Information & Recommendations from Freight Advisory Council
- 8.2 Recommendations from Stakeholder Working Group
- 8.3 Next Steps for CDOT

**Appendix A.** SB-239 Legislation

**Appendix B.** CSU Research

**Appendix C.** Stakeholder Working Group

**Appendix D.** Subcommittees

**Appendix E.** Technical Memoranda



## Literature Review

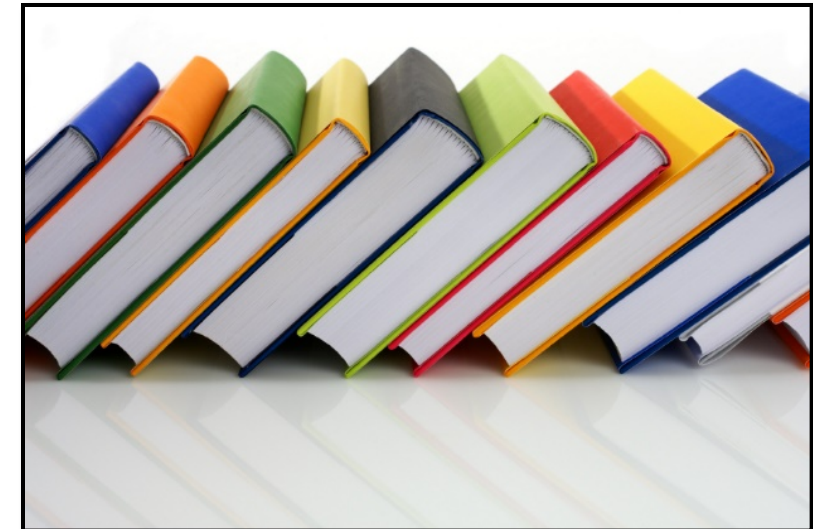
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Summary of Updates Regarding Peer to Peer Car Share Companies

Address Stakeholder Working Group Questions and Comments

Location on Shared Drive:

<https://drive.google.com/drive/folders/1lxQ1pNsMU4WGvmKXZ0nqdq7DHdRcDEsJ>



# Fee Inventory Results and EV Incentives TNCs, Taxi, Rental Car, Peer Share, Non-Peer Share and Residential Delivery

## Lily Lizarraga and S-Curve

- Reviewed 40 States, Cities, Airports
- A per trip fee ranges from \$0.10 to \$5.72
  - New York City: \$ 2.75/ride
  - Chicago: \$ 0.72
  - Boston: \$ 0.20
  - Seattle existing: \$0.24 (\$0.14/trip for TNC licensing and \$0.10 to support wheel chair accessibility;
  - Seattle new proposal: \$0.51 proposed (pay for streetcar downtown and affordable housing (\$25 million over 5 years.)
- A percent of fare fee ranges from 0.33% to 6%
- California has the most incentives for EV adoption

PEER RESEARCH ON EVs				
State Incentives	EV Registration Fees	Total State Automobile Registrations (2014)	EV Population	EV Proportion of Automobile Registrations
HOV Lane Exemption Electric Vehicle Emissions Inspection Exemption PEV Toll Discount Program PEV Rebate Program PEV Voluntary Time of Use (TOU) Rate Price Guarantee - Con Edison Smart Charging and Time-of-Use Incentives – Con Edison	NONE	5,159,696	43,382	0.8%
AFV Registration AFV Weight Exemption HOV Lane Exemption Electric Vehicle Emissions Inspection Exemption PEV Tax Credit	olo. Rev. Stat. §42-3-304(25)(a)/HB 1110 (2013)  \$50 annual fee for "plug-in electric motor vehicle," also known as BEV and PHEV "Plug-in electric motor vehicle" means: A motor vehicle that qualifies under the federal definition (26 U.S.C. sec. 30D). Any motor vehicle that can be recharged from any external source of electricity and the electricity stored in a rechargeable battery pack propels or contributes to propel the vehicle's drive wheel.	1,806,485	19,725	1.1%
Fuel Efficient Vehicle Title Excise Tax PEV Title Excise Tax Exemption AFV Conversion and Infrastructure Tax Credit	NONE	216,156	660	0.3%
PEV Fee	All-electric vehicle owners must pay an annual fee of \$200 and plug-in hybrid electric vehicle owners must pay an annual fee of \$100. Beginning July 1, 2023 and every fourth year thereafter, PEV fees will increase by \$3. A portion of fees contribute to the Electric Transportation Infrastructure Grant Program, which provides grants for electric vehicle supply equipment. (Reference House Bill 2, 2019, and Code of Alabama 40-12-242)	2,524,145	2,499	0.1%

Location of Database

<https://drive.google.com/drive/folders/1lxQ1pNsMU4WGvmKXZ0ngdq7DHdRcDEsJ>





## DENVER INTERNATIONAL AIRPORT

23790 E. 78TH AVE  
DENVER, CO 80249  
Phone: (800) 777-5500

DEN-558424

TO BE PAID BY	
RENTER NAME	
HOME/BUSINESS ADDRESS	
HOME/BUSINESS PHONE NO.	
CITY/STATE/COUNTRY	
ZIP CODE	
EMAIL ADDRESS	
DRIVER'S LICENSE NO.	STATE/COUNTRY
EXPIRES	D.O.B.
Additional Driver	
Dr. Lic. #	State
Exp. Date	Date of Birth
Address	
City	State
Zip	

You are responsible for payment of all tolls. This Vehicle is equipped with the ability to pay tolls electronically, and we offer EZTOL, a fee service that permits you to use automated express lanes within the state of Colorado without paying a toll at the time you drive through the express lane. Pursuant to the requirements of C.R.S. 43-3-302 and C.R.S. 42-4-1209, You (the Customer) are liable for payment of any toll evasion violation civil penalties and any parking violation fines incurred during the term of the Rental Period. If such a penalty is incurred, Your name, address, and state driver's license number will be furnished to the toll road or toll highway company (for toll violations) or to the prosecutorial division of the appropriate jurisdiction (for parking violation fines).

This is a non-smoking vehicle. If the vehicle is returned smelling of smoke from any source, you will pay us a cleaning fee according to paragraph 8 of the Terms and Conditions.

## OPTIONAL PRODUCTS

## COLLISION DAMAGE WAIVER (CDW)

You decline to purchase our CDW and you agree to be responsible for all damage to or loss of the Vehicle.

## SUPPLEMENTAL LIABILITY INSURANCE (SLI)

You decline to purchase SLI and you agree to be primarily responsible for all damage or injury you cause to others or their property.

## PERSONAL ACCIDENT INSURANCE/PERSONAL EFFECTS COVERAGE (PAI/PEC)

You decline to purchase PAI/PEC.

GPS Devices: The use of GPS Devices rented from us may be limited in some areas due to topographical or satellite conditions, and some new roads may not be in the GPS data base.

## FUEL PURCHASE OPTIONS (FPO)

You decline to purchase either FPO and you agree to either (A) return the Vehicle with the fuel gauge reading at least the same level as when rented, or (B) pay us an estimated refueling fee based on the fuel cost of \$8.99 per gallon. You will not receive a credit if you return the Vehicle with more fuel than when rented.

MILEAGE IN	10778
MILEAGE OUT	10772
MILEAGE DRIVEN	6
DATE TIME IN	07/07/2018 10:51 PM
DATE TIME OUT	07/04/2018 12:06 AM
VEHICLE NO.	IFJPG83879
STALL NO.	214
VEHICLE LIC. NO.	CTK542
CO	
VEH. MAKE - BODY STYLE	JEEP RENEGADE SPORT
VEH. CLS.	IFBR
AGENT OUT	CYNTHIA
AGENT IN	SEBASTIAN
VEHICLE TO BE RETURNED TO (CITY/STATE) LOC. NO.	DENVER CO DEN
VEHICLE RETURNED AT (CITY/STATE)	DENVER CO

All daily charges based on 24-hour rental day

## RATES:

7 MILES	0.00	0.00
0 HOURS	11.00	0.00
4 DAYS	33.00	132.00
0 EXTRA DAYS	33.00	0.00
0 WEEKS	0.00	0.00
0 MONTHS	0.00	0.00

Discount:

%

TOTAL TIME AND MILEAGE:

132.00

OTHER CHARGES:

REFUELING FEE	8.99 /Gal.	118.79
CONCESSION FEE	11.11 %	27.86
STATE TAX	11.25 %	18.95
COUNTY RENTAL TAX	2.00 %	3.37
CFC	2.15 /Day	8.00
COLORADO ROAD FEE	2.00 /Day	8.00
	0.00 %	0.00

TOTAL CHARGES:

317.57

TOTAL PAYMENTS:

0.00

TOTAL REFUNDS:

0.00

TOTAL DUE:

0.00

## \*\*\*INCOMPLETE RR\*\*\*

## Rental Rate\*

1 @ \$ 131.00 per day T \$ 131.00

\*Includes Unlimited Miles

Discount - R 5% Applied to Time/Mileage Chgs \$ - 6.55

## Additional Products

Frequent Flyer Surcharge T \$ .00

Fuel Purchase Option Accepted T \$ 47.16

You pre-purchased a full tank and may return at any fuel level.

## Service Charges/Taxes

CONCESSION FEE RECOVERY 11.11% T \$ 19.35

VEHICLE LICENSING COST RECOVERY .83% T \$ 1.03

FACILITY USE FEE + TAX \$ 2.43

CO RD SAFETY PROG FEE \$ 2.00

ENERGY SURCHARGE T \$ 1.40

Tax 13.250% On Est. Taxable Ttl \$ 193.48 \$ 25.64

## ADJUSTMENTS

TOTAL ESTIMATED CHARGE \$ 223.55

NY OF DENVER, 24530 E 78TH AVE, DENVER, CO 80249 (303) 342-7350

## SUMMARY OF CHARGES

Charge Description	Date	Quantity	Per	Rate	Total
TIME & DISTANCE	10/30 - 10/30	1	DAY	\$53.31	\$53.31
DW	10/30 - 10/30	1	DAY	\$19.99	\$19.99
ONE WAY FEE	10/30 - 10/30	1	RENTAL	\$146.13	\$146.13
REFUELING CHARGE	10/30 - 10/30				\$0.00
Subtotal:					\$219.43

## Taxes &amp; Surcharges

COLORADO ROAD SAFETY PROGRAM FEE	10/30 - 10/30	1	DAY	\$2.00	\$2.00
CONCESSION RECOVERY FEE	10/30 - 10/30			11.11%	\$24.38
CUSTOMER FACILITY CHARGE	10/30 - 10/30	1	DAY	\$2.15	\$2.15
DENVER COUNTY MTA TAX	10/30 - 10/30			1%	\$2.46
DENVER COUNTY OTHER1	10/30 - 10/30			0.1%	\$0.25
SV TAX	10/30 - 10/30			2%	\$4.92
OWNERSHIP TAX	10/30 - 10/30			2.9%	\$7.13
SALES TAX	10/30 - 10/30			7.25%	\$17.83
SALES TAX-MV RENTAL	10/30 - 10/30				
ITEMS					


Total Charges: \$280.55


Total Estimated Amount Due

\$280.55

PAYMENT INFORMATION TYPE

CREDIT CARD NUMBER


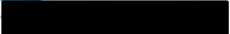


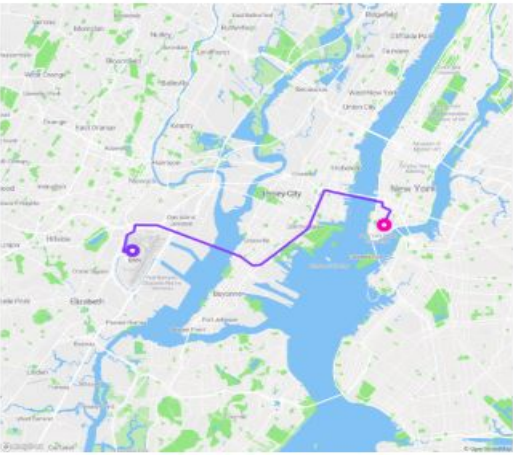


Thanks for riding with Muhammad!


June 24, 2019 at 5:03 PM


**Ride Details**

Lyft fare (14.47mi, 41m 48s)	\$47.87
Tip	\$7.18
 	<b>\$55.05</b>



- Pickup 5:03 PM  
Express Rd, Newark, NJ
- Drop-off 5:45 PM  
117 Nassau St, New York, NY





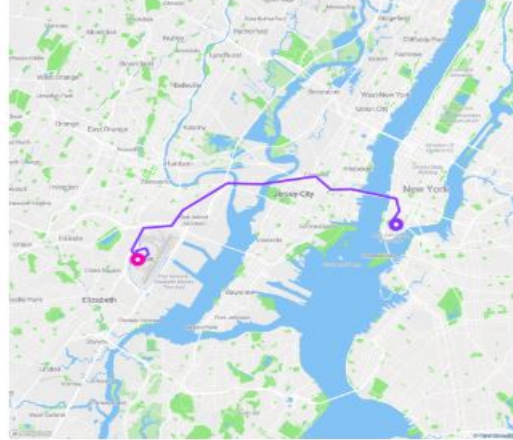


Thanks for riding with Gagandeep!

June 25, 2019 at 6:07 PM

**Ride Details**

Lyft fare (14.63mi, 49m 56s)	\$83.07
Black Car Fund Surcharge	\$2.08
 	<b>\$85.15</b>



- Pickup 6:07 PM  
76 Theatre Aly, New York, NY
- Drop-off 6:57 PM  
Express Rd, Newark, NJ

## Example of How Fee in NY is Displayed on Lyft app

The \$20 charge from trips that cross NY to NJ is not displayed on the receipt. The \$20 goes to toll charges and time and expense the driver incurs returning to their primary service area.



# 10 States With the Highest Rental Car Taxes and Fees

**1. Nevada:** Estimated taxes and fees: 16.85%-\$18.85%

Rental cars: 10% surcharge. There's also a 6.85% state sales tax and Clark and Washoe counties (home to Las Vegas and Reno, respectively) charge an additional 2%.

**2. Minnesota:** Estimated taxes and fees: 16.63%

Rental cars: 9.2% surcharge. There's a 6.875% state sales tax plus localities can add as much as 2%, for an average combined rate of 7.43%.

**3. Arkansas:** Estimated taxes and fees: 16.5%

Rental cars: 10% surcharge plus 6.5% sales tax.

**4. District of Columbia:** Estimated taxes and fees: 16%

Rental cars: 10.25% surcharge on rental cars plus 5.75% sales tax.

**5. Rhode Island:** Estimated taxes and fees: 15%

Rental cars: 8% surcharge plus 7% state sales tax.

**6. North Carolina:** Estimated taxes and fees: 14.95%

Rental cars: 8% surcharge. There's also a 4.75% state tax plus localities can add as much as 2.75%, for an average combined rate of 6.95%.

**7. Tennessee:** Estimated taxes and fees: 12.46%

Rental cars: 3% surcharge. There's also a 7% state sales tax plus localities can add up to 2.75%, for an average combined rate of 9.46%.

**8. South Carolina:** Estimated taxes and fees: 12.43%

Rental cars: 5% surcharge. There's also a 6% state sales tax plus localities can add as much as 3%, for an average combined rate of 7.43%.

**9. Connecticut:** Estimated taxes and fees: 12.35% + \$1/day

Rental cars: 3% state surcharge on top of 9.35% sales tax. A \$1 per day "tourism surcharge" is also levied.

**10. Kansas:** Estimated taxes and fees: 12.18%

Rental cars: 3.5% surcharge. There's a 6.5% state sales tax plus localities can add as much as 4%, for an average combined rate of 8.68%.

**Budget**  
(Booth)  
Name:   
Car # 81351620  
Space No.:   
Color/Model: Buick Envision

YOUR RENTAL	
Picked up	MDW
Date/Time	AUG 17, 2017@01:28AM
Returned	ORD
Date/Time	AUG 18, 2017@05:34PM
Veh Group	Standard SUV-5 Pass
Veh Charged	Standard SUV-5 Pass
Vehicle	BUICK ENVISION AWD
Odometer Out	13668
Odometer In	13660
Fuel Reading	7/8

YOUR VEHICLE CHARGES	
2 DY@	79.00
DISCOUNT	13.00
ADJUSTMENT (M)	15.00
YOUR TIME AND MILEAGE	122.46

YOUR TAXABLE FEES	
**11.11% FEE	18.73
VEH LIC RECoup	2.34

YOUR SUBTOTAL	
TAXABLE SUBTOT	143.53
TAX 21.000%	30.14

YOUR NON TAXABLE ITEMS	
FUEL SERVICE	12.50
CUST FAC CHARGE	4.75/DY
CITY SURCHARGE	2.75/RN

TOTAL CHARGES	
NET CHARGES	229.68
YOUR TOTAL DUE:	0.00

PAID ON A/C  
\*\*CONCESSIONARY FEE

THANK YOU FOR RENTING WITH BUDGET

For inquiries or e-receipt visit  
WWW.BUDGET.COM

Visit us online @ budget.com

Thank you for not smoking.  
Budget maintains a 100% smoke-free fleet.

F-1331L (1/16)



# Comparison of Requirements in Colorado (Regulated by the Public Utilities Commission)

Driver requirements	TNC – Transportation Network Companies C.R.S. §40-10.1-601	Taxis & Limousines C.R.S. §40-10.1-202 & 302	Commercial Parcel and Package Delivery	Independent Contractor Package and On-Demand Delivery	Commercial On-Demand Delivery
	<ul style="list-style-type: none"> <li>Valid Driver’s License &amp; 21 years old</li> <li>Independent background check</li> <li>Primary Driver Liability Insurance of \$1M</li> <li>Health Certificate-driver is medically fit to drive</li> <li>Limit 12 hours of consecutive driving, cannot log in after 16 cumulative hours; cannot log in more than 70 hours in 7 day period;</li> <li>Drivers are independent contractors</li> </ul>	<ul style="list-style-type: none"> <li>Valid Driver’s License</li> <li>Fingerprint based Background check</li> <li>Health certificate;</li> <li>Required Vehicle liability Insurance on file with PUC</li> <li>Hours of service limited to 12on/12off (taxi); or 15 hrs. on duty/no more than 70 hrs. in 8 days</li> <li>Taxi drivers are independent contractors per C.R.S. 8-70-140.5</li> </ul>	<ul style="list-style-type: none"> <li>Class C Commercial Driver’s License (CDL) (FedEx cargo van driver) or no CDL (UPS parcel driver)</li> <li>Safe driving record</li> </ul>	<ul style="list-style-type: none"> <li>Commercial vehicle insurance may be provided (e.g. Amazon Flex)</li> <li>19 – 21 + or over with valid driver's license</li> </ul>	<ul style="list-style-type: none"> <li>NO Commercial Drivers License (CDL) required</li> </ul>
	e.g. - Uber, Lyft		e.g. - UPS, FedEx, DHL	e.g. - Amazon, Flex, Grubhub, Postmates, GoShare	e.g. - 3 <sup>rd</sup> party Delivery Service Partner, establishment-based grocery or food delivery
REGULATED BY:	Public Utility Commission under Colorado Department of Regulatory Affairs		USDOT		

## Modeling and Estimation Approach

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Compile any and all observed data from Colorado operators

Evaluate national or other regional datasets for comparisons or starting points

Apply available modeling tools – include CDOT’s “StateFocus” travel model – to estimate travel patterns, travel changes, and emissions

Consider sketch planning and off-model estimation techniques to test broad policy considerations

Develop econometric models to test price and policy sensitivities



(credit: CBS)

## Baseline Model

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- Vehicle-Miles-of-Travel and Emissions
- Baseline 2017 and 2030
- SB 239 Focus: Six Providers
  - Transportation Network Companies
  - Peer Car Share
  - Non-Peer Car Share
  - Taxi
  - Car Rental
  - Residential Delivery

## Definitions of Providers

Provider	Definition	Examples
Transportation Network Company	A company that relies upon a mobile application to pair drivers with riders, as defined in Section 40-10.1-602 (3).	Uber, Lyft, Hop Skip Drive
Peer Car Share	A car sharing company that enables individuals to rent personal vehicles to others	Turo, Drift, Getaround, Maven
Car Clubs: Non-Peer Car Share	A car sharing company that operates a fleet of vehicles for use by individuals	Streetcar, ZipCar, Share Now, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz
Taxi	A company that provides taxicab service, as defined in Section 40-10.1-101 (19)	Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative
Car Rental	A company that rents vehicles to individuals	Enterprise, Avis, Hertz, Budget
Residential Delivery Services	A company that delivers goods to residential addresses with a vehicle having a gross vehicle weight rating under 14,000 lbs.	Uber Eats, Door Dash, UPS, Fed Ex, King Soopers residential, Amazon Delivery Service Partner, AmazonFlex

## Statewide Travel Demand Model: StateFocus

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### ■ Input

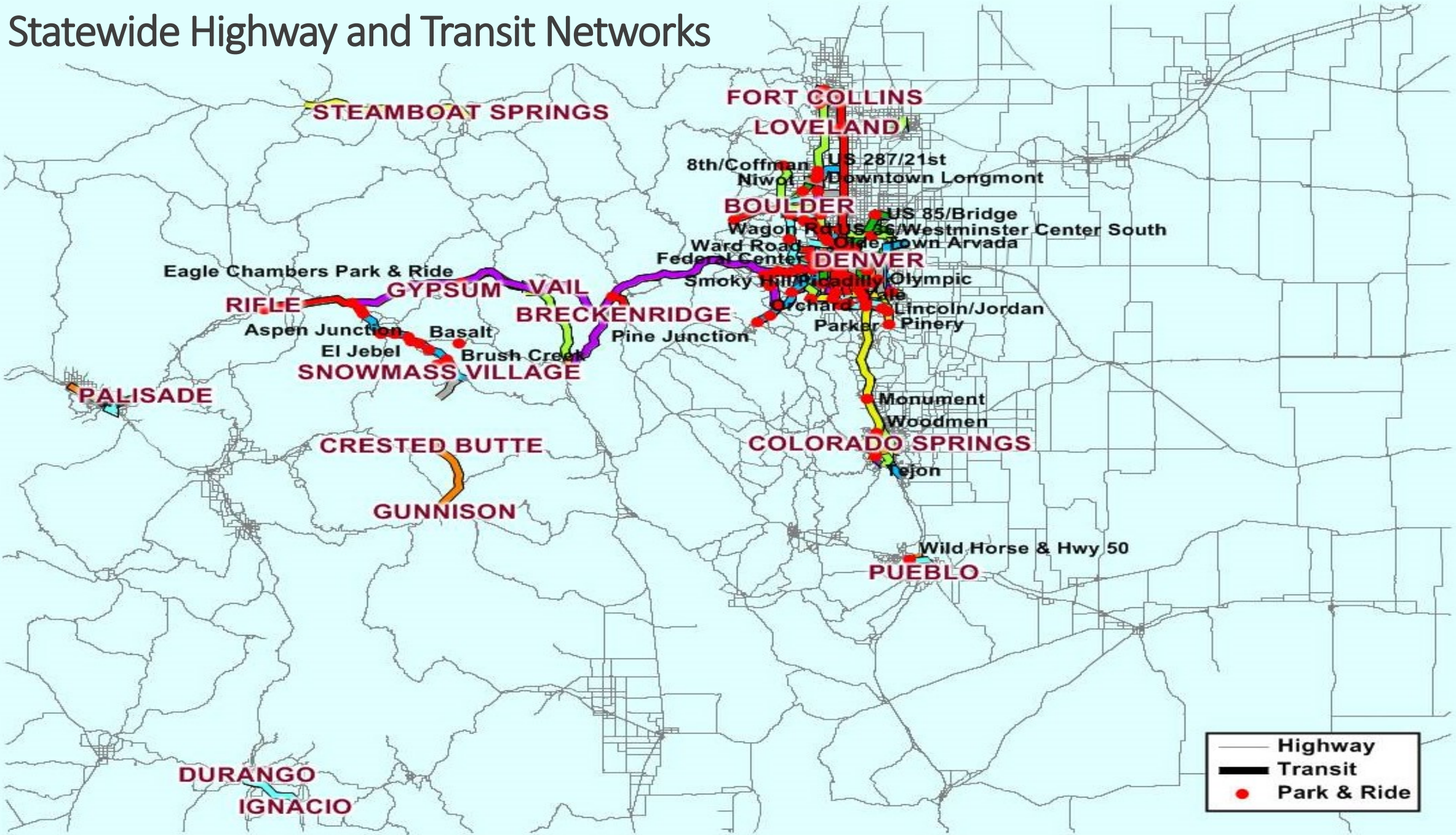
- Roadway and Transit Networks
- Population and Employment Projections from the Colorado State Demographer

### ■ Output

- Trips by Mode by purpose
- Forecasts of:
  - Roadway volumes
  - Transit ridership on routes
- Stratifications include:
  - Geographic Location
  - Time of Day
  - Vehicle type (cars, trucks, and TNCs)
  - Vehicle occupancy

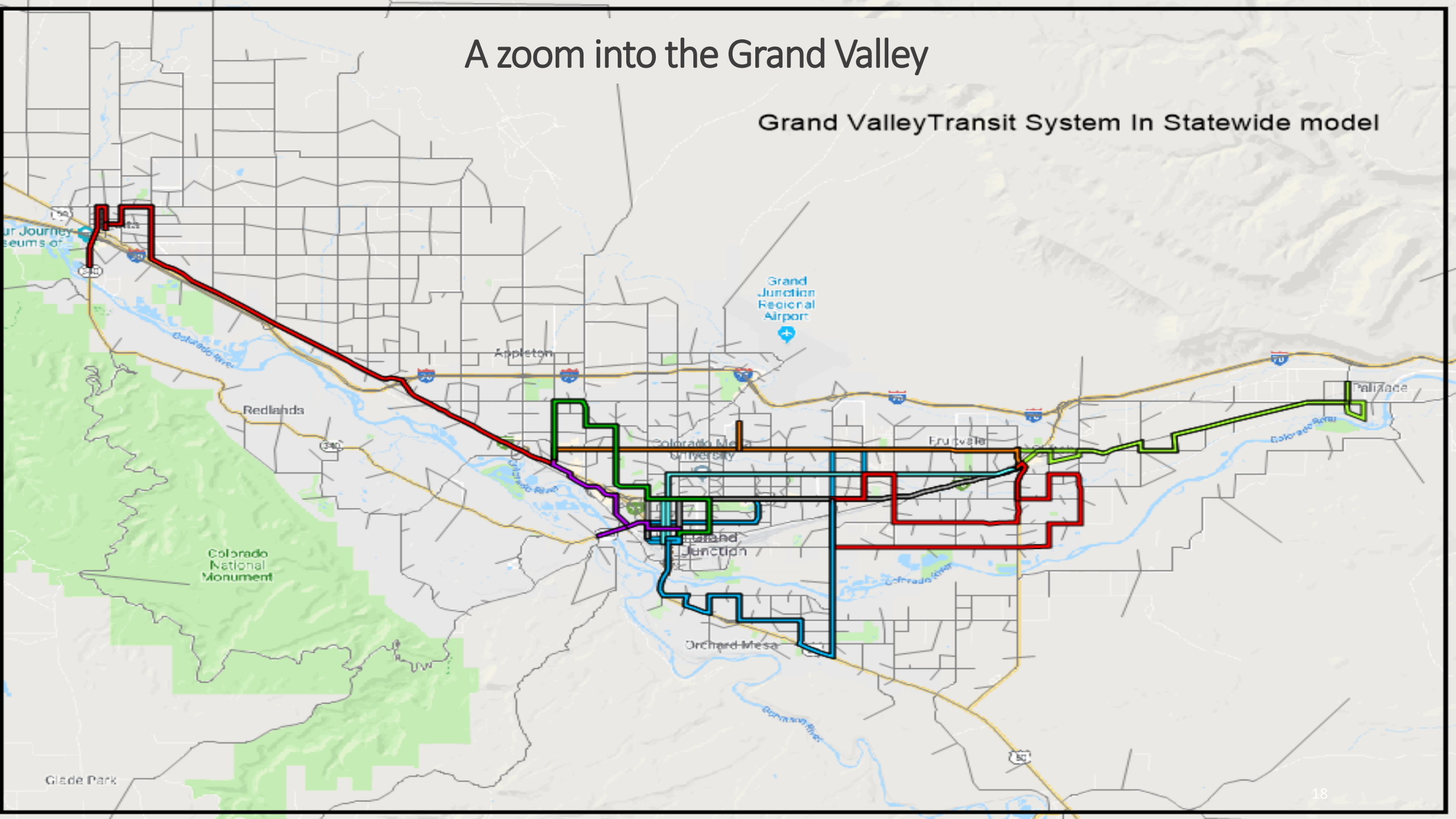


# Statewide Highway and Transit Networks



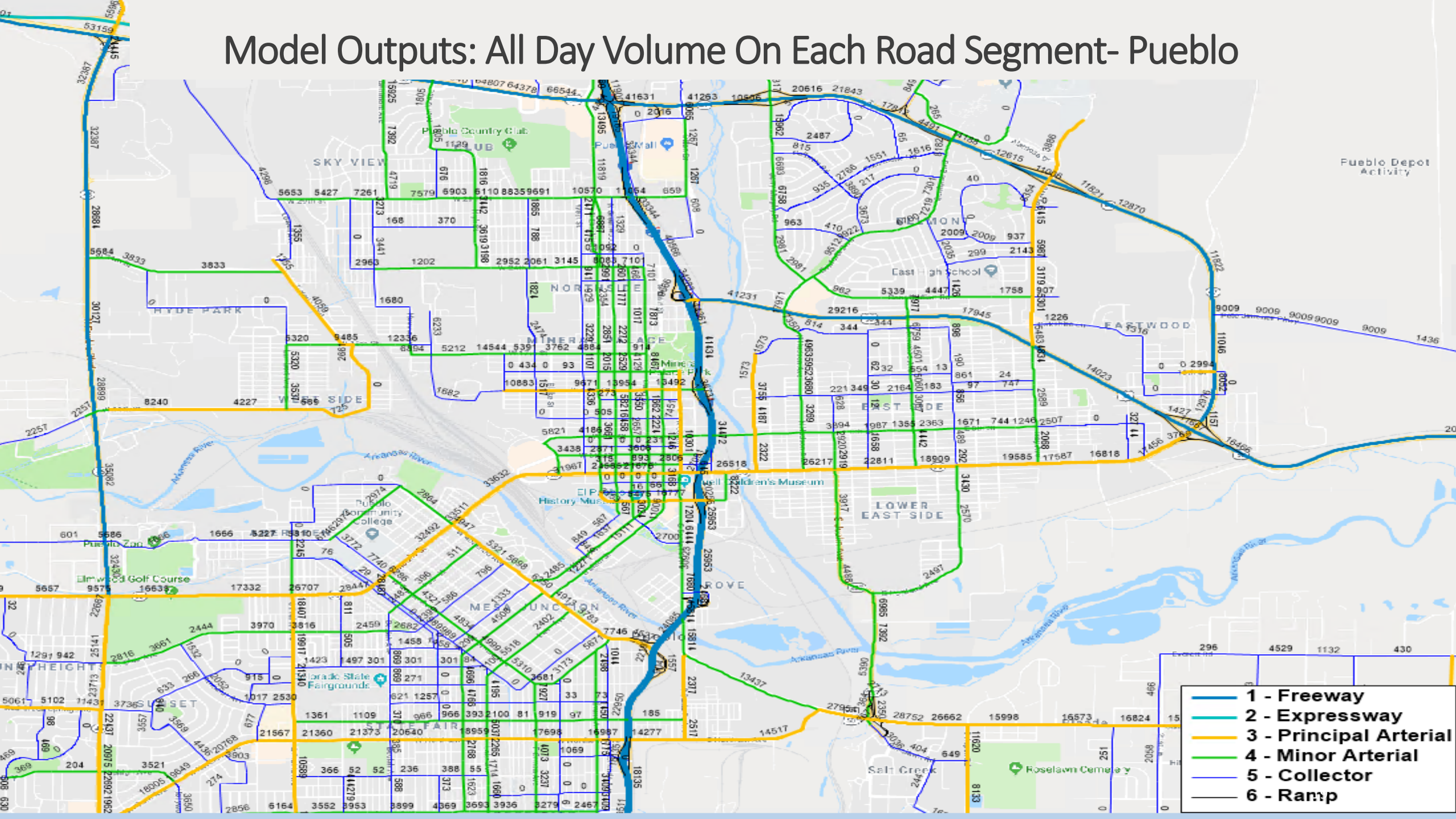
# A zoom into the Grand Valley

## Grand Valley Transit System In Statewide model



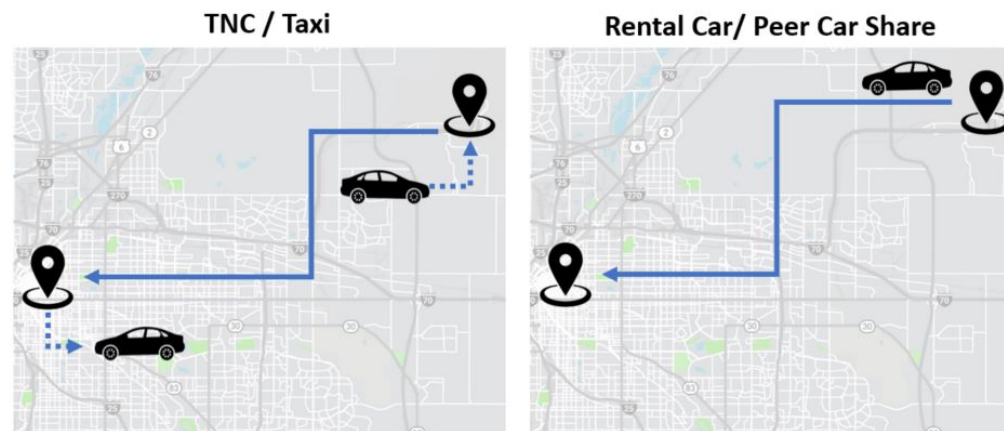


# Model Outputs: All Day Volume On Each Road Segment- Pueblo



## Off-Model

- Estimates for five providers
- Spreadsheet models
- Estimates by provider type
  - Amount of trips
  - Trip lengths
- Limited available data
- Inquiries to local providers
- Estimated Daily VMT for 2017 and 2030



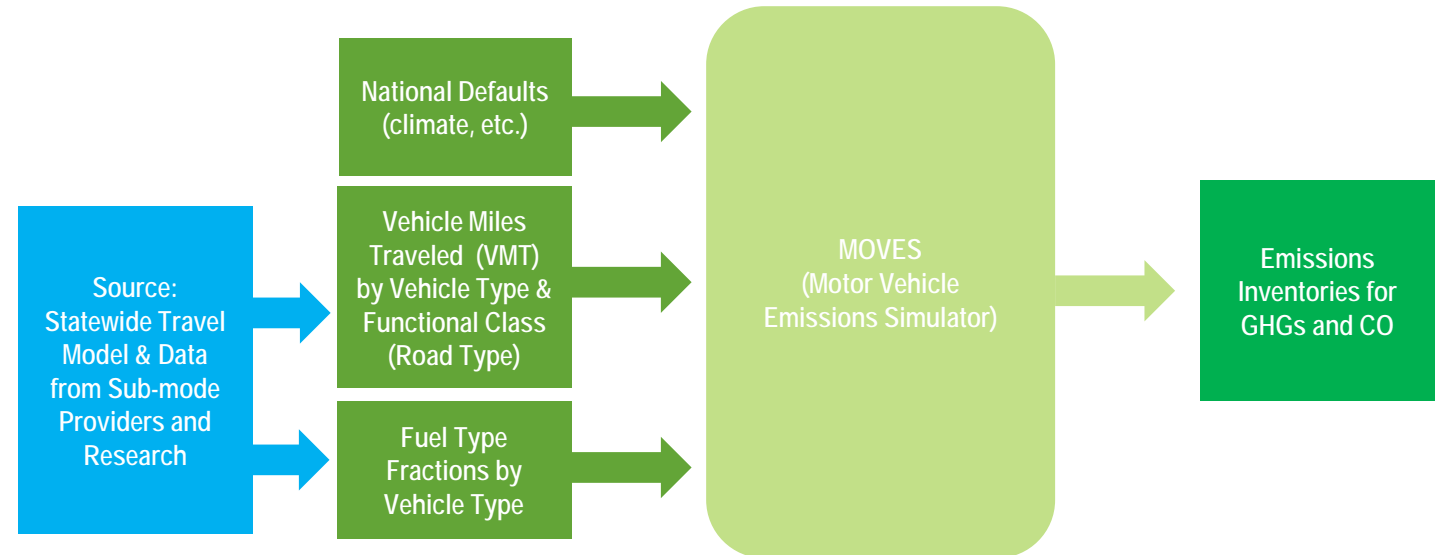
## Data Sources for Emerging Transportation Providers

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- Household Travel Surveys (NHTS, PSRC)
- Other Surveys (intercept TNC surveys, driver survey)
- Published Studies
- Disaggregate Data (Chicago and NYC TNC data)
- Locally Observed Data (PUC, DEN, Dept. of Revenue)

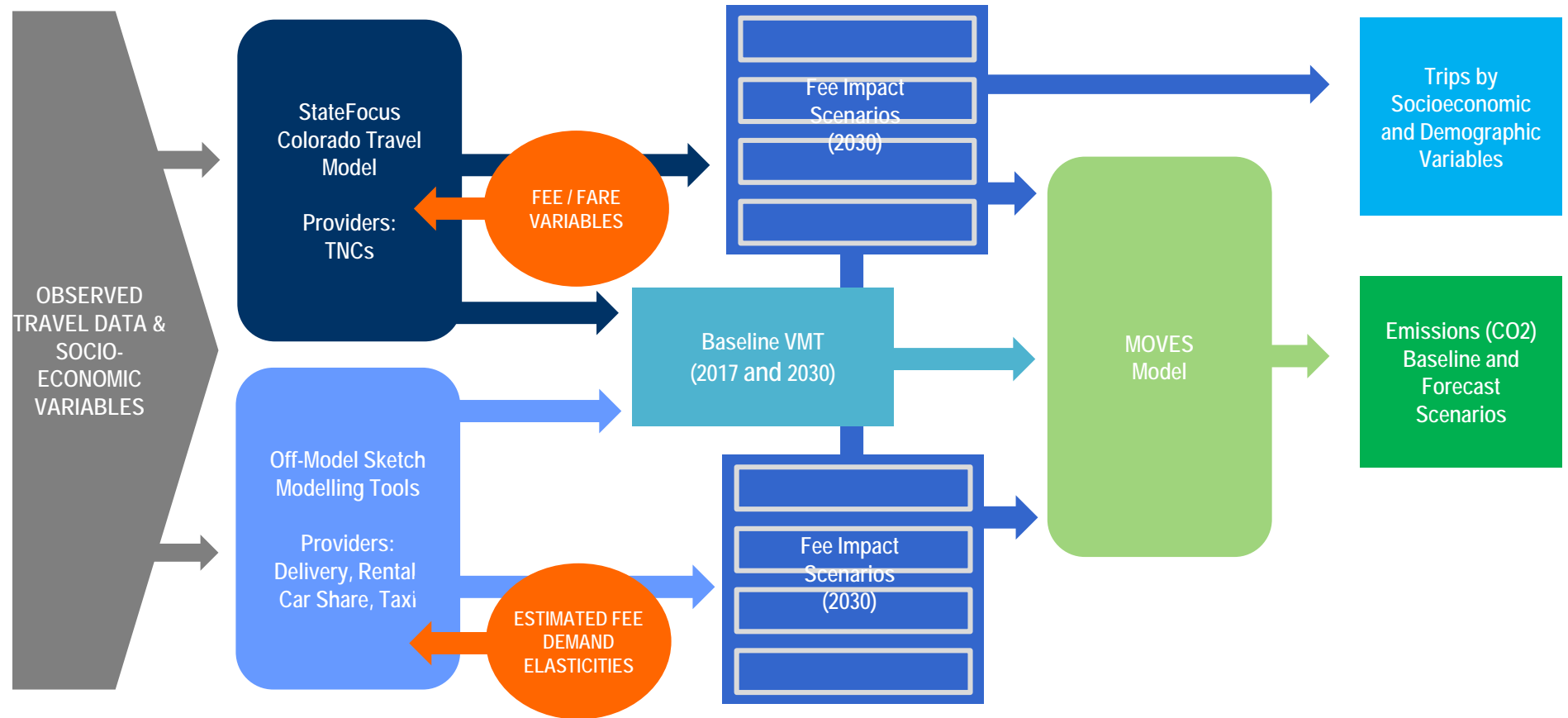
## Emissions Modeling

- EPA MOVES Model
- Emission modeling system
- Mobile sources
- Criteria air pollutants, greenhouse gases, and air toxics
- SB 239 Focus: Carbon emissions



## Overall Modeling Approach

Modeling Results  
Webinar for SWG -  
October 15





# Baseline VMT Estimates – Today

## *Initial Draft Estimates*

### 2017 Trips and VMT

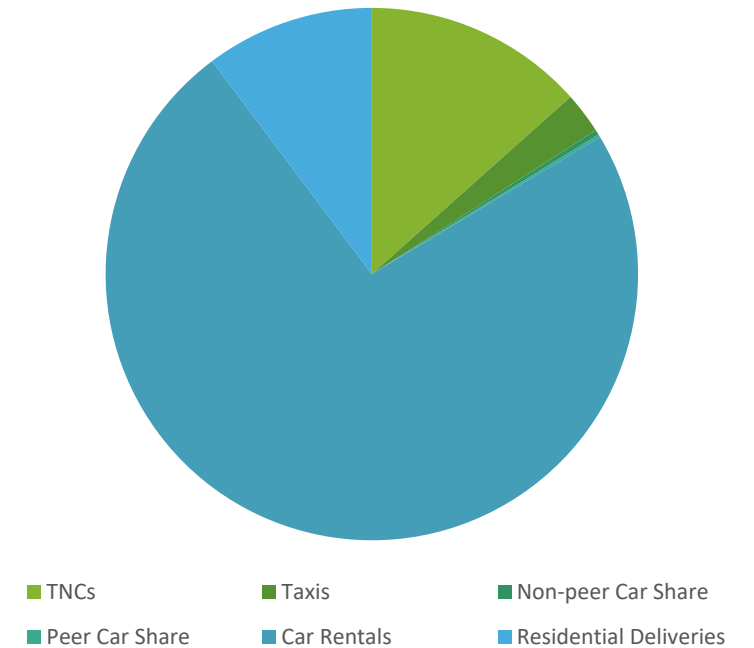
Emerging Mobility Submodes	Trips (Daily)			VMT (Daily)			Share of Total VMT
	Midpoint	Low	High	Midpoint	Low	High	Midpoint
TNCs	49,200	36,700	88,100	576,000	430,000	1,031,000	0.5%
Taxis	5,500			108,000			0.1%
Non-peer Car Share	2,000			13,000			0.0%
Peer Car Share	1,200			7,000			0.0%
Car Rentals <sup>1</sup>	47,600			3,153,000			2.5%
Residential Deliveries <sup>2</sup>	405,200			440,000			0.4%
<b>All Emerging Mobilities</b>	<b>510,700</b>			<b>4,297,000</b>			<b>3.4%</b>
All Personal Travel <sup>3</sup>	20,065,000			124,741,000			

<sup>1</sup> Car rentals per day

<sup>2</sup> Number of online purchases

<sup>3</sup> Excludes truck trips and VMT

Average VMT - Today



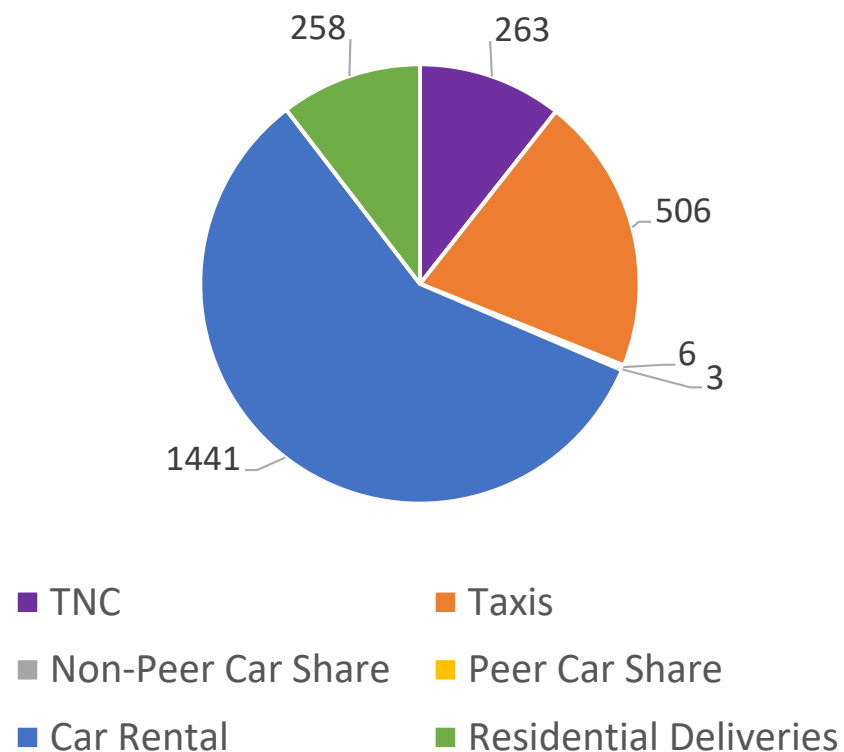
# Baseline Emission Estimates – Today

## *Initial Draft Estimates*

### 2017 Emissions

	2017 CO2e		
Emerging Mobility Providers	Tons/Day	% EM Provider Total	% of State Total
TNC	263	10.6%	0.5%
Taxis	506	20.4%	0.9%
Non-Peer Car Share	6	0.2%	0.0%
Peer Car Share	3	0.1%	0.0%
Car Rental	1441	58.2%	2.5%
Residential Deliveries	258	10.4%	0.5%
<b>Provider Subtotal</b>	<b>2478</b>	<b>100.0%</b>	<b>4.3%</b>
<b>Statewide Total CO2e</b>	<b>57,000</b>		

Share of CO2 Equivalent  
Tons/Day



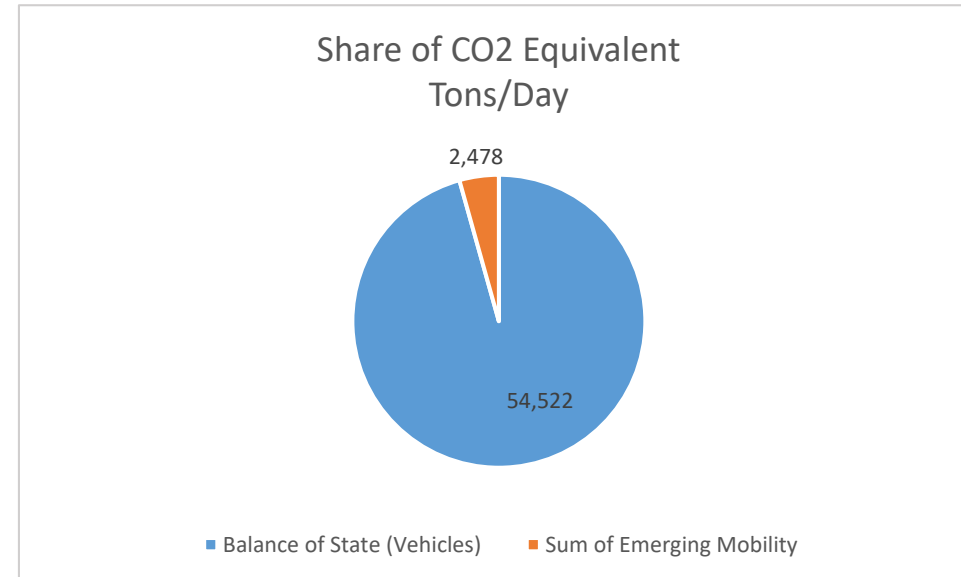


## Baseline Estimates – Today

### *Initial Draft Estimates*

#### 2017 Emissions

	2017 CO <sub>2</sub> e	
Emerging Mobility Providers	Tons/Day	% State Total
TNC	263	0.5%
Taxis	506	0.9%
Non-Peer Car Share	6	0.0%
Peer Car Share	3	0.0%
Car Rental	1,441	2.5%
Residential Deliveries	258	0.5%
Sum	2,478	4.3%
Balance of State (Vehicles)	54,522	95.7%
<b>Statewide Total CO<sub>2</sub>e</b>	<b>57,000</b>	<b>100.0%</b>





# Break (10 minutes)

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**COLORADO**  
Department of Transportation



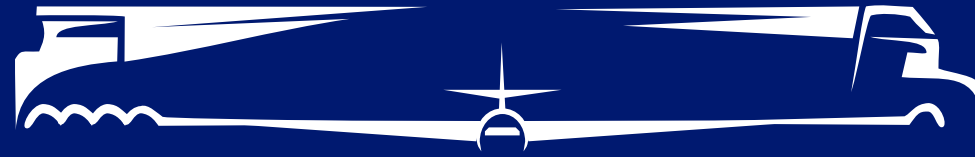
**COLORADO**  
Energy Office

# Freight Advisory Council

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Greg Fulton

Colorado Freight Advisory Council



# Emerging Mobility Impact Study

September 2019

# Emerging Mobility Impact Working Group

- Colorado Freight Advisory Council (FAC)
  - Designated forum for business to advise the State of Colorado on transportation issues impacting the freight industry
- FAC Role in Emerging Mobility Impact Study
  - SB-239 provides role for FAC to provide information on current and evolving practices for the residential delivery of goods

**An Act**

SENATE BILL 19-239

(II) RECEIVE INFORMATION AND RECOMMENDATIONS FROM THE FREIGHT ADVISORY COUNCIL REGARDING CURRENT AND EVOLVING PRACTICES RELATED TO THE RESIDENTIAL DELIVERY OF GOODS; AND

# The Rise of E-Commerce

What types of products are shoppers buying online today?



# Residential Delivery is a Mature Industry



- UPS founded 1907
- Royal Crest founded 1927
- Ryder founded 1933
- DHL founded 1969
- FedEx founded 1971
- Amazon founded 1994

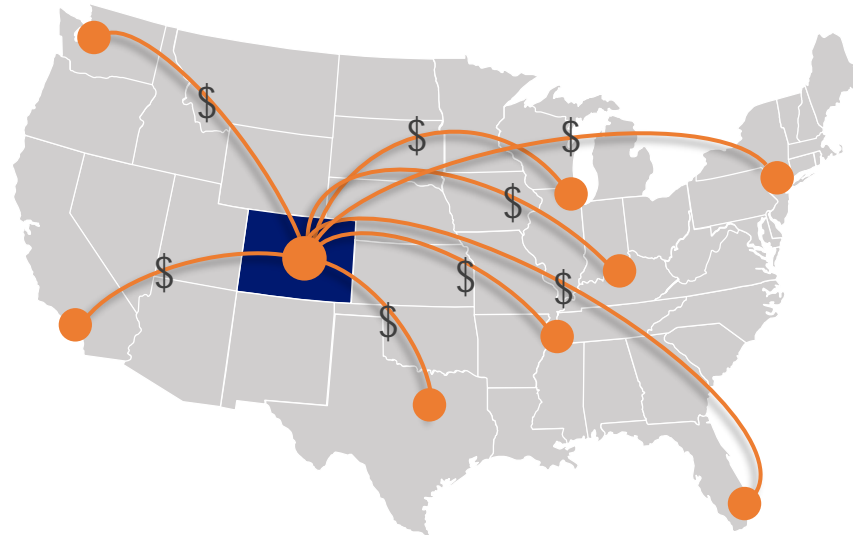




# Fees are Already Embedded in Every Parcel

## Interstate carriers are subject to Federal and state regulation

- Federal Motor Carrier Safety Administration regulates vehicle safety and inspections, driver safety and records, hours of service, insurance, and other requirements
- U.S. Dept. of Transportation imposes Uniform Carrier Registration fees for carriers in Colorado based on business type and fleet size
- State of Colorado requires stamp fees, vehicle registration fees, and business licensing fees



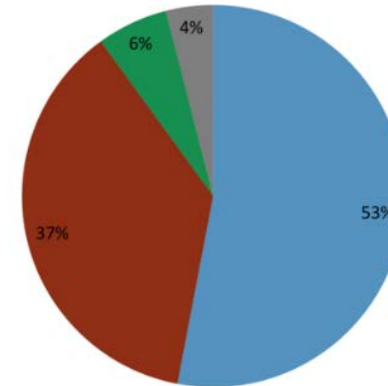
# Businesses Are Increasingly Efficient

Market forces encourage efficiency in an industry with tight margins, increasing consumer expectations, and shifting delivery patterns

- Optimizing delivery routes
- Ceasing left-turns
- Increasing shipment and stop density
- Managing fleets for efficiency and fuel savings
- Automating hubs and logistics centers

Share Of Delivery Costs, By Part Of Journey

■ Last-mile delivery ■ Line haul ■ Sorting ■ Collection



Source: Honeywell, 2016

BI INTELLIGENCE

$\frac{1}{2}$  of delivery costs  
occur in the last mile

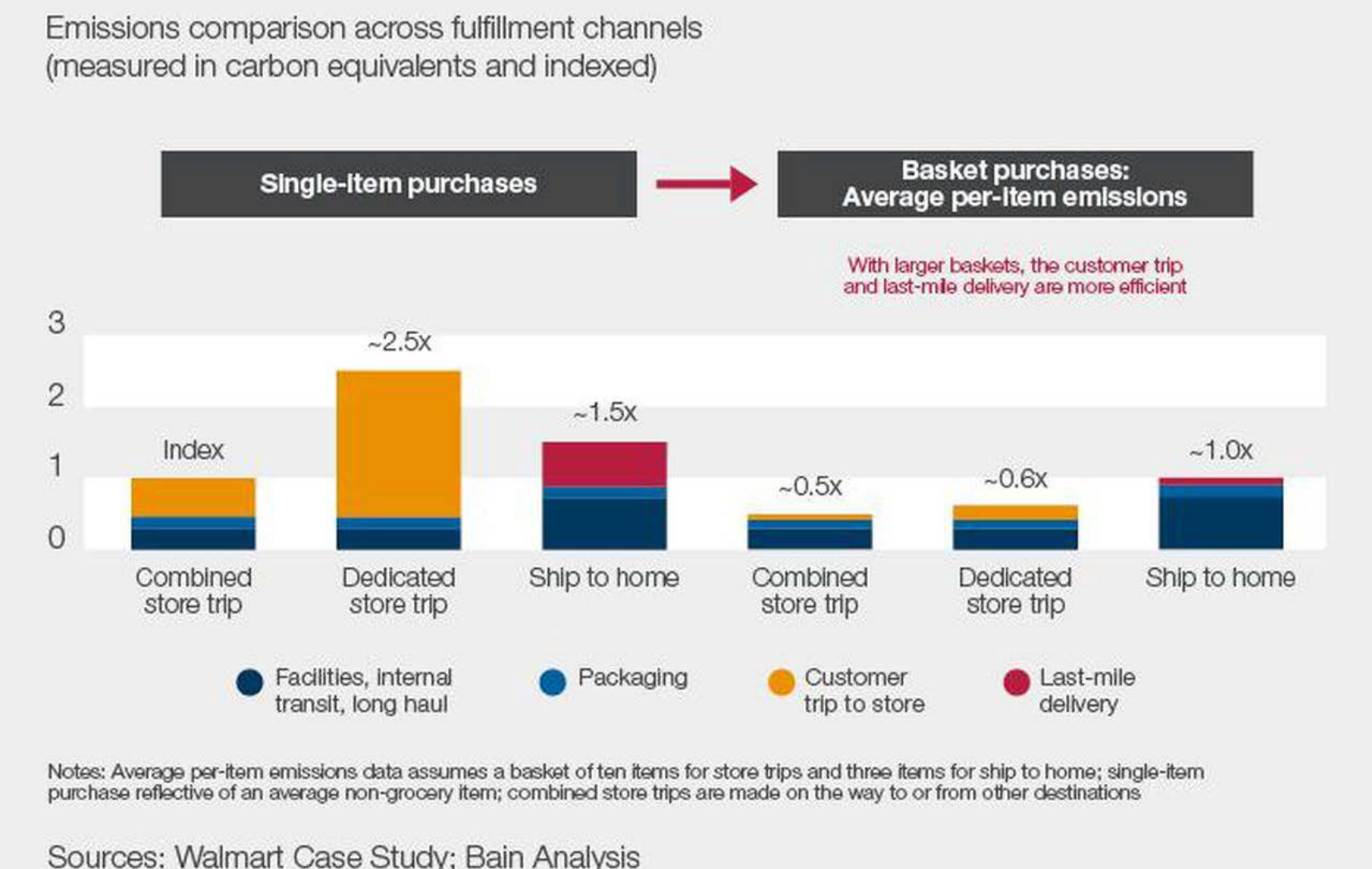
## Significant Carbon Emissions Savings

**FY18 Transportation Efficiency Gains and Cost Savings**

FedEx Initiatives	FY18 Cost Savings Estimates (\$)	FY18 Emissions Avoided (metric tons CO <sub>2</sub> e)
Fuel-efficient driving, vehicle technology improvements, alternative fuel usage and electric vehicles	\$65 million	240,171

**Amazon Locker Initiative:** Expected cut of greenhouse gas emissions by about **100,000 METRIC TONS ANNUALLY** and **10M GALLONS ANNUALLY** in projected fuel usage cuts.

# Home Delivery Can Be More Efficient



# Industry Is Adopting New Initiatives

## Unilateral adoption of efficiency and sustainability initiatives across the parcel industry

- Sustainability and carbon neutral pledges
- Adoption of electric vehicles in fleets
- Off-peak hours delivery
- Alternative delivery programs
- Electric-bikes and urban delivery solutions
- Supporting parking availability and residential delivery policies
- Encouraging responsible and green consumer behavior



# Progress Toward Carbon Neutrality





## Delivering for Colorado

- FAC is examining range of potential solutions
- Industry collaboratively working with public sector on actions and strategies

Questions?







# DRAFT Sub-Committee Recommendations



Sub-committee	Draft Recommendation
Natural Environment	Fee based on carbon emissions per passenger-mile (and package or weight mile) per vehicle
Natural Environment	Zero-emission VMT standard - (Require an increasing percentage of miles traveled by covered fleets to happen in zero-emission vehicles).
Safety	Evaluate areas to improve hotspot pickup/dropoff locations to promote safety for all road users (peds, vehicles, freight, etc)
Safety	Better VMT analysis needed to better understand trips (congestion occurrence, replacement vs new trip, etc)
Safety	Add data on the crash form for driven for commercial purposes (TNCS, car shares, package delivery, and others)
Safety	Continue to promote research/innovation and provide infrastructure test beds as necessary/helpful (also for CV).
Safety	Education to Colorado drivers on emerging technologies (ADAS, TNCs, etc)
Safety	Review regulations on hours of service between various commercial providers (TNCS, car shares, package delivery, and others)
Safety	First responder training program to deal with EV's involved with vehicle crashes.
Safety	Understand the safety impact of the medical provision
Electrification	Waived or reduced fee for ZEVs for any proposed fee for commercial vehicle trips
Electrification	Policy reassessment timeline to assess need of any imposed fee at an appropriate date in the future (appropriate cap, sunset data, periodic assessment)
Electrification	Transportation Fare Transparency (Fare estimates should show the price difference between the cost of a trip in an ICE vehicle versus a ZEV)
Social Impact & Equity	Fee structure should consider the ability of emerging technology companies to expand and grow in Colorado. The fees implemented should not hamper the development of innovative solutions especially for rural areas
Social Impact & Equity	No fees should be applied to shared rides or rides provided by a wheelchair accessible vehicle.
Social Impact & Equity	Fees should be reduced or eliminated where and when mobility options are limited, such as when public transit is less available.
Social Impact & Equity	Consider the equity of the fee structure on companies, on vulnerable and on underserved populations. These populations include the vehicle operators (the drivers), passengers (the riders) and E-commerce package recipients.
Social Impact & Equity	Fees should be eliminated or minimized in transportation trips originating and ending in Colorado's opportunity zones and low-income communities
Social Impact & Equity	Fees should be eliminated or minimized for commercial delivery of groceries in areas that are underserved by grocery stores or deemed "food desert" neighborhoods
Congestion Mgt	Expand voluntary employer transportation demand management (TDM) programs
Congestion Mgt	Explore mandatory employer TDM programs
Congestion Mgt	Examine other incentives to promote vanpools, carpools, and other forms of shared ridership
Congestion Mgt	Continue implementing TDM strategies for construction zones and for special events
Fee	Flat fee
Fee	Mileage driven based fee
Fee	Percentage of transactions fee



## Locations of Information for Sub-Committees

Expanded documentation for each subcommittee	Documentation Link
#1: Sustainability: Incentivizing Vehicle Electrification	<a href="https://drive.google.com/open?id=1cTjjp9kMBCQ_V2x8LZ63Lzsn2fzfdImO">https://drive.google.com/open?id=1cTjjp9kMBCQ_V2x8LZ63Lzsn2fzfdImO</a>
#2: Natural Environment Impact and Emissions Analysis	<a href="https://drive.google.com/open?id=1yNVrZD4mSm9CP-CQyphXFuTKWv803DsV">https://drive.google.com/open?id=1yNVrZD4mSm9CP-CQyphXFuTKWv803DsV</a>
#3: Congestion Management: Incentivizing Shared Ridership and New Mobility Subcommittee	<a href="https://drive.google.com/open?id=1zZmhXjVepjon5d-qDhAVtbl3xnYIm3Fu">https://drive.google.com/open?id=1zZmhXjVepjon5d-qDhAVtbl3xnYIm3Fu</a>
#4: Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies	<a href="https://drive.google.com/drive/folders/1A77tSrq_WgYfTO8PaJRvrXu5whb12lCX">https://drive.google.com/drive/folders/1A77tSrq_WgYfTO8PaJRvrXu5whb12lCX</a>
#5: Social Impact and Equity Analysis	<a href="https://drive.google.com/open?id=1uL-J9iwhxuZ4ZJTyvJZ3FdHf7kZ2qCtT">https://drive.google.com/open?id=1uL-J9iwhxuZ4ZJTyvJZ3FdHf7kZ2qCtT</a>
#6: Safety	<a href="https://drive.google.com/open?id=13KF5MA3F026BZWEtqC7S7giJq4dQrfSZ">https://drive.google.com/open?id=13KF5MA3F026BZWEtqC7S7giJq4dQrfSZ</a>



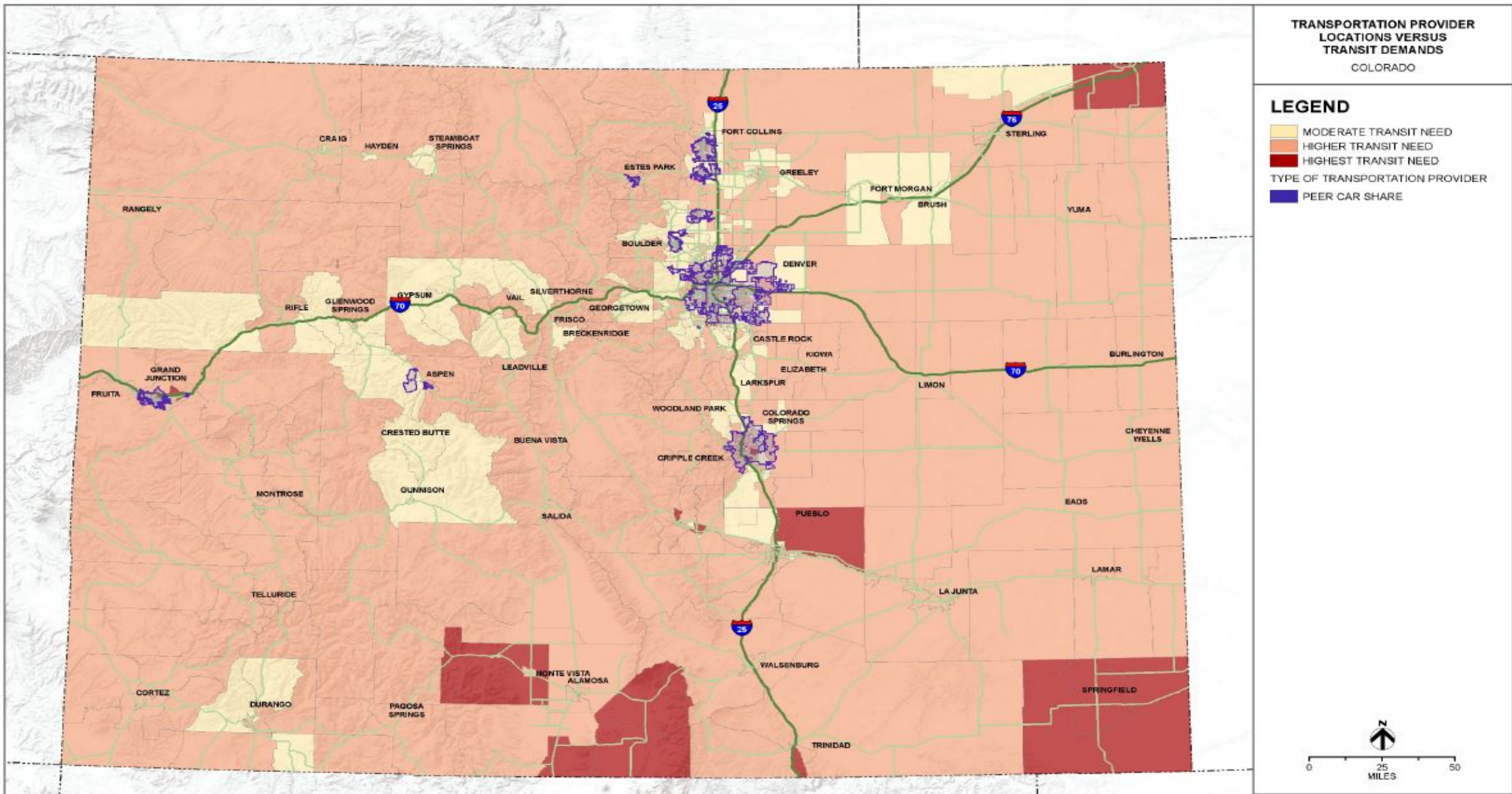
## Updated Tech Memo on Gap Analysis

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Location on Google Drive:

<https://drive.google.com/drive/folders/1aLLKooitnx2v5UGKlorVBygOehD5Lrbt>

Figure 5a: Peer Car Share Providers overlaid on Transit Need

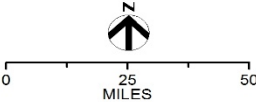
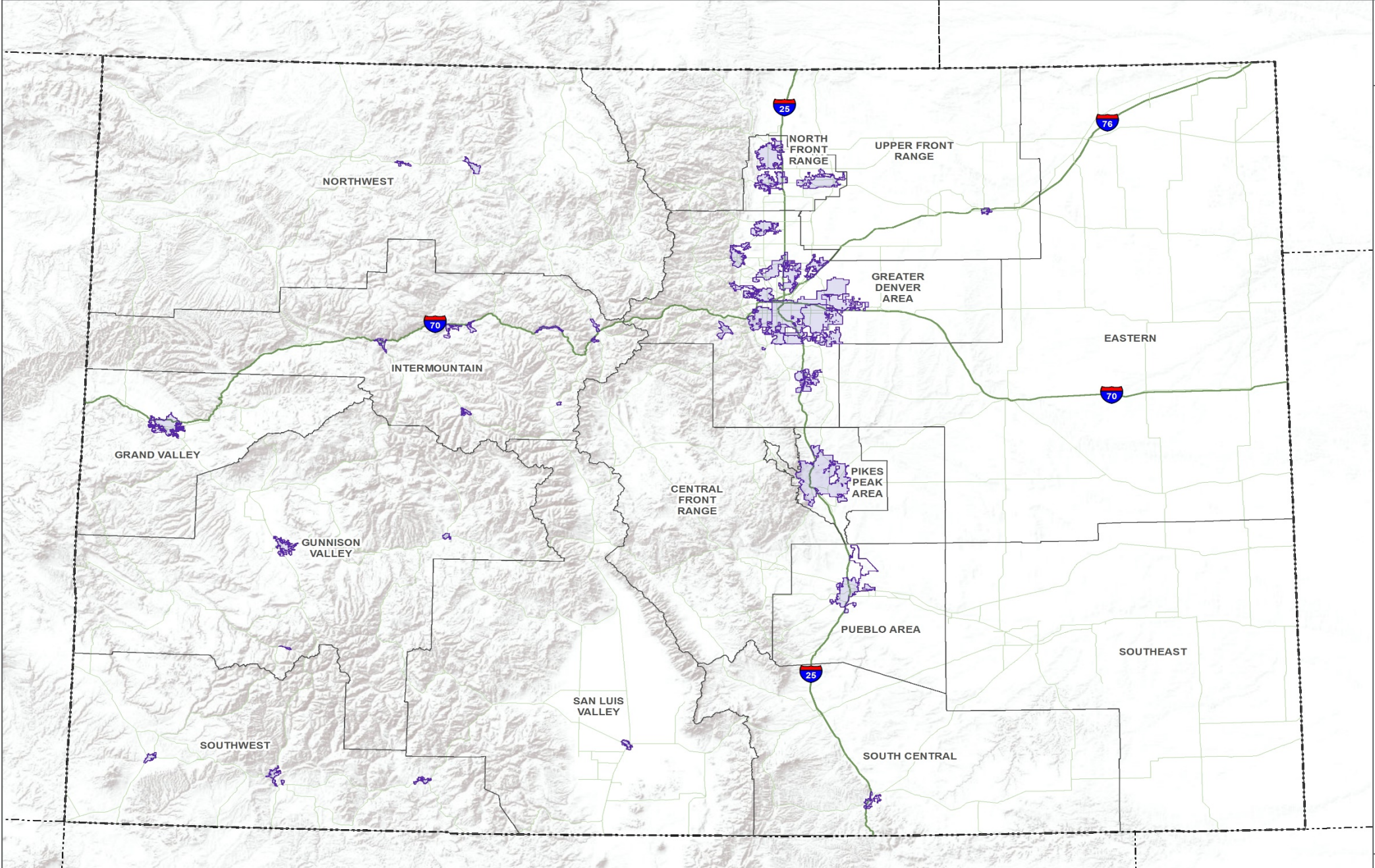




TRANSPORTATION PROVIDER  
LOCATIONS VERSUS  
TPR/MPO AREAS  
COLORADO

LEGEND

- TPR/MPO BOUNDARY
- TYPE OF TRANSPORTATION PROVIDER
  - CAR RENTAL



Data from Social and Equity Analysis Sub-Committee  
Location of Car Rental Companies by Metropolitan Planning Organizations and Transportation Planning Region





## Fee Structure Discussion: Nick Farber, HPTE

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“What fee structure best meets the goals and objectives of SB 19-239?”



# Fee Structure Subcommittee Progress

**DRAFT: August 16, 2019 Comparison of Fee Structures in Other Cities and States**

**NOTE: Additional Research Will Investigate Fees on Other Commercial Transportation Modes: Including TNCs, Taxis, Rental Cars, Peer Car-Share, Non-Peer Car-Share, & Residential Car-Share**

Location	Revenue Collected	Revenue	Collected by? How collected?	Collecting an p data? Willing to share?	Revenue generated	How has the program been received by the public and stakeholders?	Has the program been administered?	Was a study conducted before implementation? Willing to share?	Has the program been implemented?
Alabama	% of total fare - city regulations placed on as a part of this bill, no longer able to charge a tax or require a business license	100% to Public Service Commission 50% to trip-originating cities and counties						February 2019	
California	2.5% of total TNC revenue - suspended 2018 Recently passed a 1.0 cent per mile under 100 miles TNCs (regardless of whether they are a for-profit or not-for-profit) TNC vehicles (as a grant program)	2.5%: 100% to California Public Utilities Commission 100% to Public Service Commission (to be used to regulate TNCs) - 1.0 cent per mile TNC vehicles (as a grant program)	Public Utilities Commission			Have been collecting data since 2014. TNCs must report annually on ride share, time, zip code of start and end, total time, total VMT. Recently passed a 1.0 cent per mile under 100 miles. TNCs and will start collecting more specific information as a result such as specific vehicle and longitude of ride pickup and drop-off locations. Also collecting data on time spent in different periods (Period 1: App is on, no passengers in the car, waiting to find a match. Period 2: On route to pick up a passenger. Period 3: Driving with passenger). This data is private and they are unable to share with us.	Under the 2.5% fee, as result revenue came in. But the PUC had excess funds, hence the State Department of Finance requested the fee.	No study was conducted	N/A
Chicago	\$0.12 per ride, \$0.10 for 1/2 hour, \$1.00 for 1/2 hour, \$1.00 for 1/2 hour, \$1.00 for 1/2 hour	Wish to city general fund to be Business Affairs and Consumer Protection (other fee) - fee to city accessibility fund (conversion of fees/TNCs to be wheelchair accessible)	Department of Business Affairs and Consumer Protection			Collected substantial data on TNC ride (time, time, cost, whether shared riding was sufficient, etc.) https://data.cityofchicago.org/Transportation/The-Information-Network-Provides-Taxi-Data-127g	Adopted 2019		
Delaware	\$0.12 per ride, \$0.10 for 1/2 hour, \$1.00 for 1/2 hour, \$1.00 for 1/2 hour	Wish to city general fund to be Business Affairs and Consumer Protection (other fee) - fee to city accessibility fund (conversion of fees/TNCs to be wheelchair accessible)	Department of Business Affairs and Consumer Protection			Collected substantial data on TNC ride (time, time, cost, whether shared riding was sufficient, etc.) https://data.cityofchicago.org/Transportation/The-Information-Network-Provides-Taxi-Data-127g	Adopted 2019		
Illinois	% of total fare - city regulations placed on as a part of this bill, no longer able to charge a tax or require a business license	100% to Public Service Commission 50% to trip-originating cities and counties						February 2019	
Maryland	State has allow individual counties and municipalities to impose their own per	100% to State Transportation Network Assessment Fund then	collected by the TNC quarterly to submit to the State Transportation Network Assessment Fund then to						



## Connecting Fees to Policy Outcomes

### Congestion

- Mitigate increased congestion caused by TNCs and commercial vehicles by funding additional transit operations

### Zero – emissions vehicles

15 vehicles and infrastructure

10 low income, minority seniors and other at risk

10 infrastructure investments to increase transit

transportation services purchased through a contract 40-10.1-602 (3)

FEE STRUCTURE OPTIONS & EVALUATIONS (+positive effect -negative effect 0 neutral effect)							
Fee Structure	Options	Congestion Management	Curb Space Management	Air Quality	Safety	Equity	Access
Time of Day	Peak/Non Peak						
Geo fencing/ Location	Urban/Rural						
	AQ Attainment/ AQ Non-Attainment						
	City Center/Sub-urban						
Occupancy	Zero to 4 passengers						
Vehicle Type	EV / Non-EV						
	Wheelchair Accessible (WAV) / non-WAV						

## Commercial Vehicles Fees – parameters and opportunity

### Fee vs. Tax

**Tax:** “If the primary purpose of a charge is to raise revenue for the expenses of government, then the charge is a tax.”

**Fee:** “A charge is not a tax if the primary purpose of a charge is to reasonable direct and indirect costs of providing a service or regulatory activity, because such a charge does not raise revenue for the government.”

Source: 2018 CO 36 No. 165C377, Colorado Union of Taxpayers Found. v City of Aspen—Taxation—Constitutional Law—Local Government I

### PEER CAR SHARE

- A peer-to-peer car sharing company
- Examples: Turo, Getaround, Maven, Drift

### CAR CLUBS: NON-PEER CAR SHARE

- A car sharing company that does not use a peer-to-peer business model
- Examples: Streetcar, ZipCar, Car2Go, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz

### TAXI

- A company that provides taxicab service as defined in Section 40-10.1-101 (19)
- Examples: Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative

### CAR RENTAL

- A motor vehicle that is rented out by a rental car company
- Examples: Enterprise, Avis, Hertz, Budget, and others

### RESIDENTIAL DELIVERY

- A motor vehicle that is used for residential delivery of goods (under 14,000 lbs. weight vehicle)
- Examples: Uber Eats, Door Dash, UPS, Fed Ex, restaurant food delivery, package delivery, grocery home deliveries





# Fee Scenarios - Assessment

## Feasibility to Implement

1. State government
2. Local government
3. Providers

## SB 19-239 goals

1. Improve air quality by reducing emissions
2. Improve air quality by advancing the adoption of ZEVs
3. Reduce congestion by reducing VMT
4. Reduce congestion by incentivizing shared ridership

## Revenue generation (model output for three fee structures)



# Fee Scenarios - Application

Vehicle Type	By Time of Day	By Location	By Air Quality Conformity
Internal Combustion Engine (ICE)	Peak Hour Congestion	Urban	Non-Attainment
	Non Peak Hour Congestion	Rural	Attainment
ICE & Zero Occupancy Vehicle (ZOV)	Peak Hour Congestion	Urban	Non-Attainment
	Non Peak Hour Congestion	Rural	Attainment
Zero Emission Vehicle (ZEV) /shared	Peak Hour Congestion	Urban	Non-Attainment
	Non Peak Hour Congestion	Rural	Attainment
ZEV & ZOV	Peak Hour Congestion	Urban	Non-Attainment
	Non Peak Hour Congestion	Rural	Attainment





# Fee Scenarios

## Subcommittee Feedback

- Mileage Based
- Percentage of Transaction
- Flat

# Fee Structure Key Considerations

		Milage Based	Perctange of Transaction	Flat
Feasibility	State/Local Government	2	4	4
	Providers	2	3	5
SB 239 Goals	Improve air quality by reducing emissions	5	3	3
	Improve air quality by advancing the adoption of ZEVs	3	3	3
	Reduce congestion by reducing VMT	3	3	2
	Reduce congestion by incentivizing shared ridership	5	3	4
Revenue Generation	Model output (TBD)			

1 (Extremely difficult to implement)

5 (Relatively simple to implement)



# Mileage-Based

Challenging to administer

Difficult to track for rental cars, particularly when traveling or renting across state lines

Could cause confusion and potential double counting for TNC drivers that use multiple apps

Privacy concerns for drivers and users

Highly reliant on use of technology to track mileage - challenging for some industries

Addresses emissions considerations

Residential delivery vehicles will pay more because of lack of pick up/drop off locations (i.e. circling the block)



## Percentage of Transaction

For delivery of goods it is difficult to determine if goods were purchased out of state to determine cost

For car rental, it is difficult to identify how many people are in a car and if shared rides have been motivated

## Flat

Easiest to administer

Would disadvantage rental car customers due to other existing fees imposed





# | General Subcommittee Feedback

Questions about responsibility for collecting fees

Fee structure combination options should be considered



Revenue generated from the fee should be shared with local governments

Ease of implementation is a key consideration for industry

Consideration should be given to fees already applied to industry

Fee is imposing costs to industry that don't currently exist, and may make it more difficult to adopt ZEVs







# Stakeholder Working Group: which fee scenario option is the easiest to administer?

Mileage Based  
Fee

Percentage of  
Transaction Fee

Flat Fee



# Stakeholder Working Group: what fee structure option best meets the goals and objectives of SB 19-239?

Mileage Based  
Fee **A**

Percentage of  
Transaction Fee **B**

Flat Fee **C**

## Public Comment Period

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Jonathan Bartsch, CDR



## Moving Forward and Next Steps

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Jonathan Bartsch, CDR



APPENDIX B

WORKING GROUP MEMBERSHIP AND MATERIALS

**Modeling Webinar  
Presentation  
October 15, 2019**







## HDR Modeling Webinar – SB-239 – 10/15/2019

### Attendees

#### *CDOT*

- Lisa Streisfeld
- Lily Lizarraga
- Aaron Wilson
- Andrew Karisan
- Simon Logan
- Sophie Schulmann
- Rose Waldmann
- Krista Flynt
- Erik Sabina
- Nichola Farber
- John Featherstone
- Matthew Inzeo

#### *HDR*

- Smith Hyung
- Michelle Bina
- Chris Primus
- Chris Williges
- Dallas DeFord
- Thomas Rossi

#### *External*

- Melissa Rey
- John Hennelly - Teamsters
- Megan Wagner - UC Health
- Daniel Hutton - Denver South TDM Association
- Thomas Rossi
- Melissa Young - AllState
- Megan Wood-Trombley - Enterprise
- Johanna Jamison - SHARENOW
- Robert Williams - GetAround
- Maria Eismann - Colorado Energy Office
- Jenny Adler- Department of Revenue
- John Emson - Colorado State Patrol
- Piper Overstreet - Uber
- Jake Swanton - Lyft
- Meigan Wood-Trombley - Enterprise

- Jim Moody - Colorado Contractor's Association
- Travis Madsen - SWEEP
- Tom Ross - CS Cons
- Matty Gross - Auto
- Will Toor - CEO
- Celeste Winnifred - Ford
- Avery Turner - Capstone
- Teamsters - woman - check
- Diego Lopez - North CO Clean
- Joshua Sperling - NREL
- Alejandro Henao - NREL
- Dustin Weigl - NREL
- Adam Zerran - Governor's Office
- Christian Williss - Colorado Energy Office
- Cammie Grant - Amazon and Enterprise Repre
- Matt Fromer - SWEEP
- Chris Hansen
- Matthew Groves - CO Auto Dealers Association
- Jennifer Brandberry - Brandberry McKenna

### **Actionable Items**

- Travis Madsen has highlighted elements in the Natural Environment Impact technical memo that might be addressed through the findings of the modeling, and would like HDR to take a look.

### **Agenda**

- To discuss the key modeling approach undertaken for the SB-239 study, and to review and explain the results - including the impact of fees upon emerging mobility industries' trips, VMT, and emissions, and the state's revenues.

## Notes

### *Results from Modeling*

#### Limitations of the Data

- These are draft modeling results and, given there was a tight timeframe in which to conduct the analysis, there are not a lot of details to explore as a result.
- While various fee structures and scenarios were explored, we cannot possibly know what will ultimately be explored by the legislature.

#### Types of Modeling

- The data spans from observed data (highest degree of confidence, based on a clear point-in-time picture), through modeling and forecasting (projected from observed data through statistical techniques), to sketch data (least degree of confidence, based on observed data to fill in details and provide rough estimates).

#### Methodology

- The Colorado Statewide Demand Model was used to process the demo data, and to model transportation choices (as illustrated on slide 6) for a typical day for Colorado residents.
- HDR collected Colorado-specific data where available, sourcing from the Department of Revenue and utility providers. Elsewhere, data to estimate the average trips, average trip length, deadheading, etc. of emerging mobility industries was also sourced from other US cities to calculate the baseline VMT for the various modes.

$$\begin{array}{l}
 \text{Number of Daily} \\
 \text{Trips} \\
 \times \\
 \left( \begin{array}{l} \text{Avg. Trip Length} \\ + \\ \text{Deadheading/} \\ \text{Repositioning} \end{array} \right)
 \end{array}
 =
 \begin{array}{l}
 \text{Estimated Daily} \\
 \text{Vehicle Miles} \\
 \text{Traveled (VMT)} \\
 \text{by Providers}
 \end{array}$$

**Above:** VMT Calculation used for the study.

## Transportation Network Companies (TNCs)

- The average trip length estimated was 3-8 miles, with between 20 and 50% dead-heading. A study in Colorado produced estimates of 7 miles and roughly 40% respectively.
- The spread on slide 9 is indicative of the level of uncertainty within the estimates (owing to poor data and the rapidly-changing nature of the industry).
- However, the correlation between the TNC trip figures for recent years reconciles well with a study conducted in Seattle (slide 10), showing similar levels of year-on-year growth and trip numbers.
- It was taken as reasonable, therefore, to plot a linear trend line to project out the growth of TNC trips in Colorado.
- Three scenarios were created, based on the contemporary TNC markets of Colorado and cities (Chicago and San Francisco) in the US. Based on the projected density of the state and its make-up, Chicago was assumed to be a suitable model for Colorado in 2030.

## Car Shares

- The lack of data available for car shares resulted in estimates and projections with a low level of confidence (slide 13, purple flags).
- There was also a difficulty in producing reliable trip length estimates, because of the disparity in what different car share services aim to do (to either cater to short or long-haul trips).

## Taxis

- We do have good base data for the taxi industry due to the records of the PUC, hence strong confidence in the estimations.
- On current trends, in which trips by the taxi industry have been declining rapidly year-on-year, the low estimate for taxi trips in 2030 is zero.

## Car Rental

- Similarly, the \$2/day fee levied on car rentals in Colorado lends the model a large sample size. Unfortunately, there aren't similar records for the trip length of car rentals, so the Household Travel Survey was used for an average.

## Residential Delivery

- In lieu of much quantifiable data for residential delivery, a combination of anecdotal information (how often does your restaurant get orders online? etc.); National Household Travel Survey data; and studies estimating parcel deliveries for apartment complexes were used.
- Residential delivery is broken down into three categories: i] online grocery delivery, ii] restaurant (and similar) delivery, and iii] e-commerce.
- Restaurant data was the weakest, and across all three a lot of assumptions had to be made.
- A US Bank Report on industry trends was used to project the number of daily deliveries for restaurants, rising from 34k today to 301k in 2030.
- For online grocery shopping, the modelers assumed a 3% usage across the state, rising to 9% in 2030.
- For e-commerce, the National Household Travel Survey was used to produce an average of online purchases per month, which was then converted to daily, and then into VMT using estimates of trip lengths for the package delivery firms (who are incredibly efficient). From this basis, trips are projected to trip and average trip lengths are expected to double.

## Overview of VMT/Trip Estimates and Forecasts

- The share of VMT accounted for by the emerging mobility industry seems small, but transit makes up 1.8% currently, so 2.8% for TNCs is quite significant in context.
- The degrees of uncertainty are reflected in the spread of the estimates for each industry on slide 18.
- The share of VMT made up by emerging mobility industries is higher in the MPO regions than statewide.

## Emissions Modeling

- The EPA Moves model was used to estimate emissions. This was ran for a base year at a national scale, on a weekday in January and July to represent a Summer and Winter spread, and then ran again for 2030 and reconciled with the Statewide Model to account for the disparity observed between the figures.
- Car rentals overwhelmingly account for CO<sub>2</sub> emissions currently, followed by residential deliveries. Emerging mobility industries account for 3.6% of the CO<sub>2</sub> produced by the state's travel.
- TNCs jump in the 2030 model, and the sum of the emerging mobility industries' contributions to the state's CO<sub>2</sub> emissions from travel increase by 75% to 7.5% of the statewide share. **[This assumes that no fee structure has been implemented].**



- Overall, the state's CO<sub>2</sub> emissions are expected to fall due to standards put in place by the previous state administration.

### **Fee Structures: Methodology**

- The baseline VMT and emissions figures were modified by the three fee structures: a mileage-based fee, a flat fee, and a % of total fare fee.
- In each instance, the fees were graduated: i] lowest (zero emission vehicles (ZEVs) **and** pooled rides), ii] middle (ZEVs or pooled rides), and iii] highest (internal combustion engines (ICEs) **and** single-user rides).
- The elasticity of demand (the responsiveness of the quantity demanded to changes in price) was derived from the limited research conducted in this field, which produced a wide range of elasticities.
  - Inelastic: less-than-proportionately responsive to demand (e.g. -0.3). For instance, the price rises by 10% but demand only falls by 3%.
  - Elastic: disproportionately responsive to demand (i.e. above 1). For instance, the price rises by 10%, but demand falls by 30%.
- The literature surveyed showed both inelastic and elastic demand elasticities, varying widely based on location, mode, trip purpose and so on.
- Four assumptions:
  - A constant elasticity was adopted to keep the analysis simple (i.e. elasticity does not increase or decrease as the price rises and falls).
  - A customer must *perceive* changes in price in order to react accordingly.
  - Cross-elasticity (how demand would shift between travel modes in response to the fee) was not modeled.
  - Trip lengths do not change with fee structure.
- There was not enough evidence to suggest a statistically significant difference of elasticities for trip purposes, ICE vs. low emission vehicles, urban vs. rural markets, or between emerging modes.
- The same elasticity was therefore applied across the entire state, which probably does not reflect reality.
- Two elasticities were used for the analysis to account for uncertainty, and to model high- and low-end scenarios.
- **The monetary figures in slides 28 through 34 are given in 2019 dollars.**

**Fee Structures: Results** [Note: Figures are in dollars, not millions of dollars as label suggests].

- The low impact modeled a low fee structure combined with inelastic (unresponsive) demand, whereas the high impact modeled a high fee structure with elastic (responsive) demand.
- The flat fee has the strongest effect when applied to the TNC data, due to the higher % of total cost the fee would represent (for the generally short trips).
- For pooled rides, the results are lessened because of the graduated fee structure, but again the flat fee generates the largest response.
- For peer-to-peer car shares, the impact is smaller because the share of the marketplace is simply smaller, but again the flat fee has the largest effect.
- Non peer-to-peer car shares: a slightly larger market, but a similar disproportionate response to the flat fee.
- Taxis: the flat fee again has the largest effect.
- Car rentals: the % of total cost fee has the largest effect for car rentals due to the higher overall cost of car rental.
- Residential delivery: only modeled for the % of fee, because the mode includes several different types of delivery, and the fee structures are all different. It was difficult to apply an average, generalizable fee for the purpose of estimations.

### **Effect of Incentives on TNC Adoption of ZEVs**

- No information was available about this topic in the literature
- A recent study by the Colorado Energy Office, projecting different scenarios of electric vehicle growth (sales and ownership), was therefore used as a basis.
- The model applied their baseline case (business as usual), and compared to their ZEV+ scenario (which reflects state incentives for ZEV adoption).
- This growth was then applied to the TNC mode, and the change in CO2 emissions and VMT were calculated from these two growth scenarios.

## Questions

- Why were these particular demand elasticities chosen, given they aren't within the confidence interval of those surveyed? **Matt Groves**
  - The modelers used a lower and higher band of elasticities, rather than selecting through a statistical process, in order to reflect those extremes and produce those high- and low-end scenarios. There were outliers above and below these values, and the choices were meant to capture a general range rather than represent a robust statistical estimation of an upper/lower band.
- Given the expressed goal of Colorado is to lower statewide emissions by 35% system-wide by 2030, would it be possible to shift the modeling to account for these goals - especially considering ZEV adoption, pooled rides, and emerging mobility vs. other modes might help meet these goals, can we look at this from that direction? What are the impacts of the fees upon the wider transportation sector and its emissions? **Travis Madsen**
  - While these questions were deemed outside of the scope and capacity of this analysis, especially with the limited timing afforded by the bill to conduct the report, these are areas we can explore in the future with improved data collection.
- Will we be sharing slides immediately after? Does the methodology include the fuel efficiency, average fares, etc. used for the model? **Jake Swanton**
  - Both elements will be included in the materials sent out by HDR.
- Especially for the per-mile fee, where was the range derived? Jake believes that the highest fee in the nation in this case is significantly less than a dollar. **Jake Swanton**
  - This was just a sampling, and not intended to be representative. The legislature will decide on the ultimate fee (or otherwise).
  - NYC has a fee set at \$2.75
- Why were the fees set as they were in each of the scenarios, given they presented such different results and the flat fee seemed much higher? **Alejandro Henao**
  - Nothing to say they cannot be normalized; HDR just have not had time to get that done - it could be something to explore in the future.
  - Alejandro thinks that the low scenario should be comparable across the three scenarios in order to compare apples to apples

- Did the future demographic make-up of Colorado influence how the adoption of technology and the use of different emerging mobility modes were modeled? **Joshua Sperling**
  - Michelle Bina (HDR)

Hi Josh,

I received your question on sensitivity to demographic changes in CO. This is a great question and something that I've spent a lot of time thinking about. The simple answer is "yes, but more in some cases and less in others." The forecasted travel, based on projections from the CO State Demographer's Office / DOLA, were definitely incorporated into all forecasts, in one way or another.

In the forthcoming technical appendices, we have more details on how various trip/VMT estimates were developed. For example, in the case of ridesharing and carsharing, we applied a model (estimated based on PSRC survey data that asked respondents on how frequently they use these services) to a synthetic population for Colorado, used in the travel demand model. That model was sensitive to things like age and smartphone ownership. For example, those who are 45 now are less likely than 25 year olds to use these services today. When we applied that model to the 2030 synthetic population, we applied the age variables not to the age they are in 2030, but the age they were in 2015. So, for those that are 45 in 2030, the applied model would use the propensities estimated for 30 year olds today, not 45 year olds. The same line of thinking was used to adjust for smartphone penetration. This kind of detail wasn't always available for analyses of all modes; but where we were able to implement that level of disaggregate analysis, we definitely took into account demographic changes in CO. However, given limited time for the study and lack of local, disaggregate data, we didn't get have many chances for these deeper dive analyses. Your point is well taken and something I have on my radar for future analyses, if the opportunity becomes available.

Feel free to call or respond if you have any other questions.

Thanks,  
Michelle





**COLORADO**  
Department of Transportation



**COLORADO**  
Energy Office

# 2019 Emerging Mobility Impact Study Modeling Webinar

These powerpoint slides display the initial modeling results presented to the Working Group on October 15th at the "Modeling Webinar". The modeling results were draft; and additional updates were made following feedback from the Working Group. The final modeling results may be found in Chapter 4 of the 2019 Emerging Mobility Impact Study.

October 15, 2019  
3:00 to 4:00



**DRAFT**





# Agenda



ITEM		TOPIC	TIME
1	Introductions	<ul style="list-style-type: none"><li>• Welcome</li><li>• Technical Team Introduction</li><li>• Review Agenda</li></ul>	3:00 to 3:05
2	Modeling Approach	<ul style="list-style-type: none"><li>• StateFocus Model</li><li>• Off-Model</li></ul>	3:05 to 3:10
3	Transportation Provider Baseline VMT and Emissions	<ul style="list-style-type: none"><li>• TNCs</li><li>• Car Share Peer-to-Peer</li><li>• Fleet Car Share</li><li>• Taxis</li><li>• Rental Cars</li><li>• Residential Delivery</li><li>• MOVES Model</li></ul>	3:10 to 3:25
4	Elasticity Analysis	<ul style="list-style-type: none"><li>• Elasticity Assumptions</li></ul>	3:25 to 3:30
5	Fee Structure Analysis and Revenue Generation Results	<ul style="list-style-type: none"><li>• Mileage Based Fee</li><li>• Flat Fee</li><li>• Percentage Based Fee</li></ul>	3:30 to 3:45
6	Questions and Answers	<ul style="list-style-type: none"><li>• Discussion</li></ul>	3:45 to 4:00

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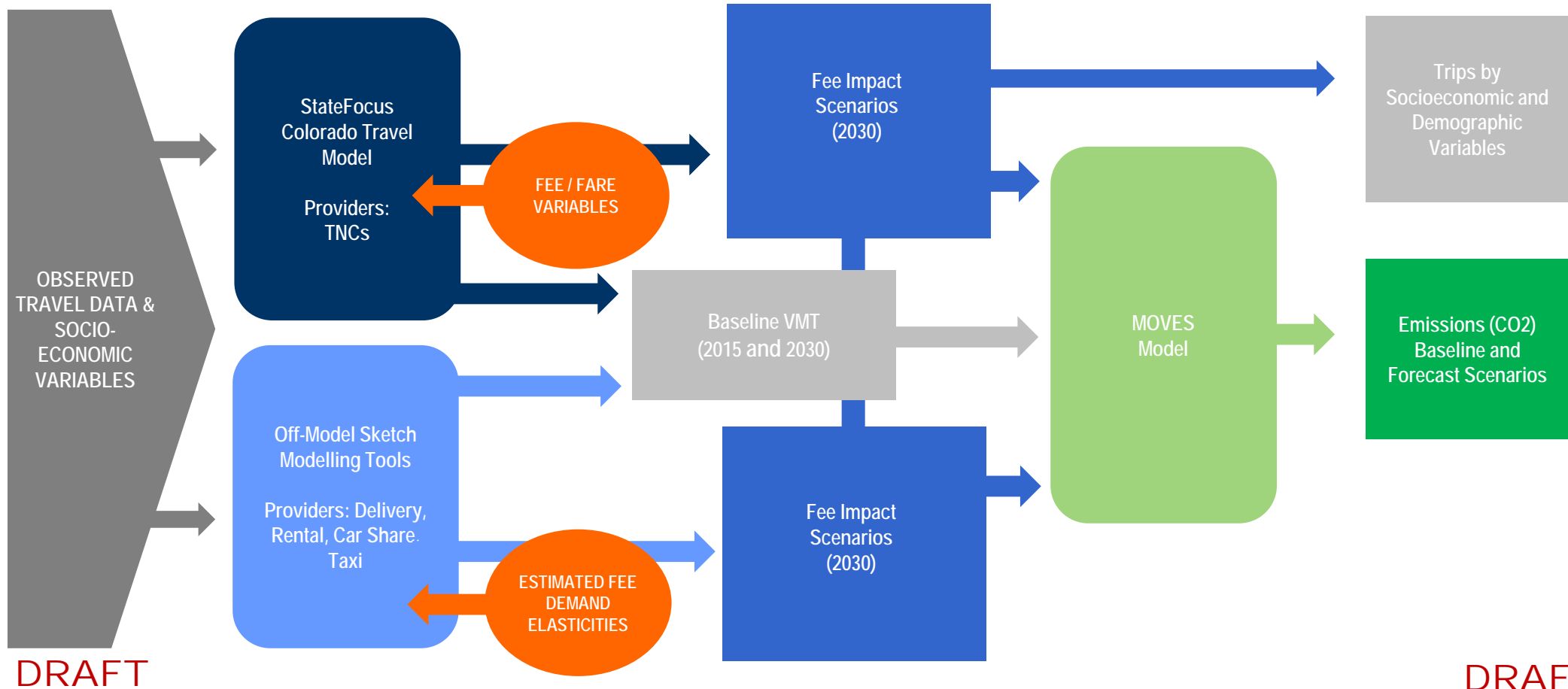
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## EMIS Modeling

- This modeling is conducted for the purposes of being able to understand potential impacts of six emerging mobility providers on congestion and emissions in present day and horizon year 2030.
- The modeling is also conducted to be able to assess the impacts of potential fee structures on travel behavior and emissions contributed by the emerging mobility providers.
- The model provides estimates of the value of reduced carbon emissions from potential fee structures.
- Lastly, this model provides estimated forecasts for potential revenue generation by 3 fee structures.
- At this time, it is unknown if these specific fee structures, or variations thereof, will be implemented by the state legislature.
- The analysis is provided for research and estimation purposes for the Working Group, CDOT and CEO.

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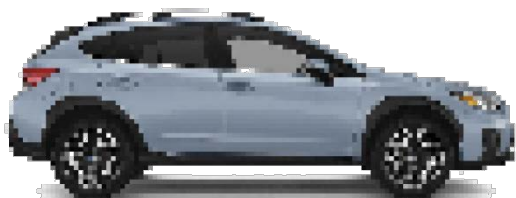
# EMIS Modeling Approach



## Modeling Limitations



- **Observed Data** – Provides a clear point-in-time picture. Actual counts or real-world data. Useful for calibrating models or estimates or applying national data to Colorado context.



- **Modeling and Forecasting** – Provides big picture approximation of conditions. Based on observed data using established statistical techniques. Supports range of forecasts and information for Colorado.

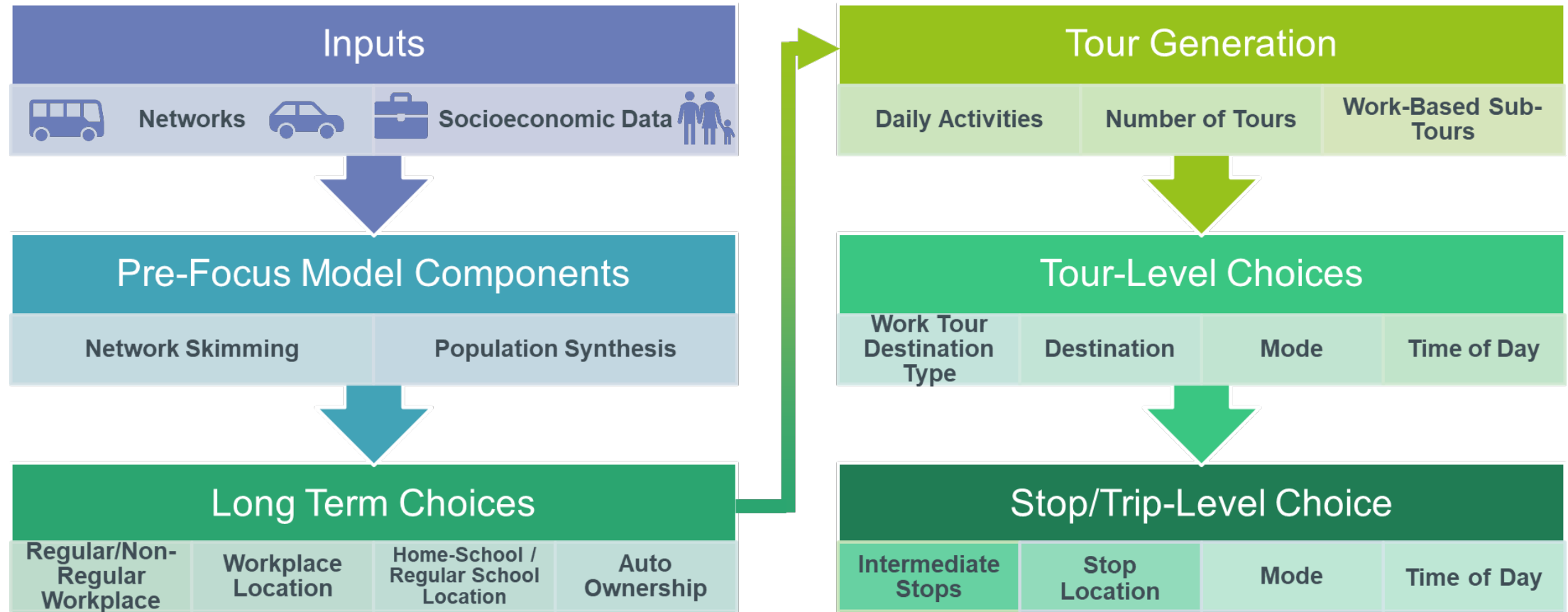


- **Estimation Techniques** – Help fill in basic details and provide rough estimates. Sketch planning tools or analytical assumptions. Based on observed or modeled data but may be less sensitive or unique to Colorado.



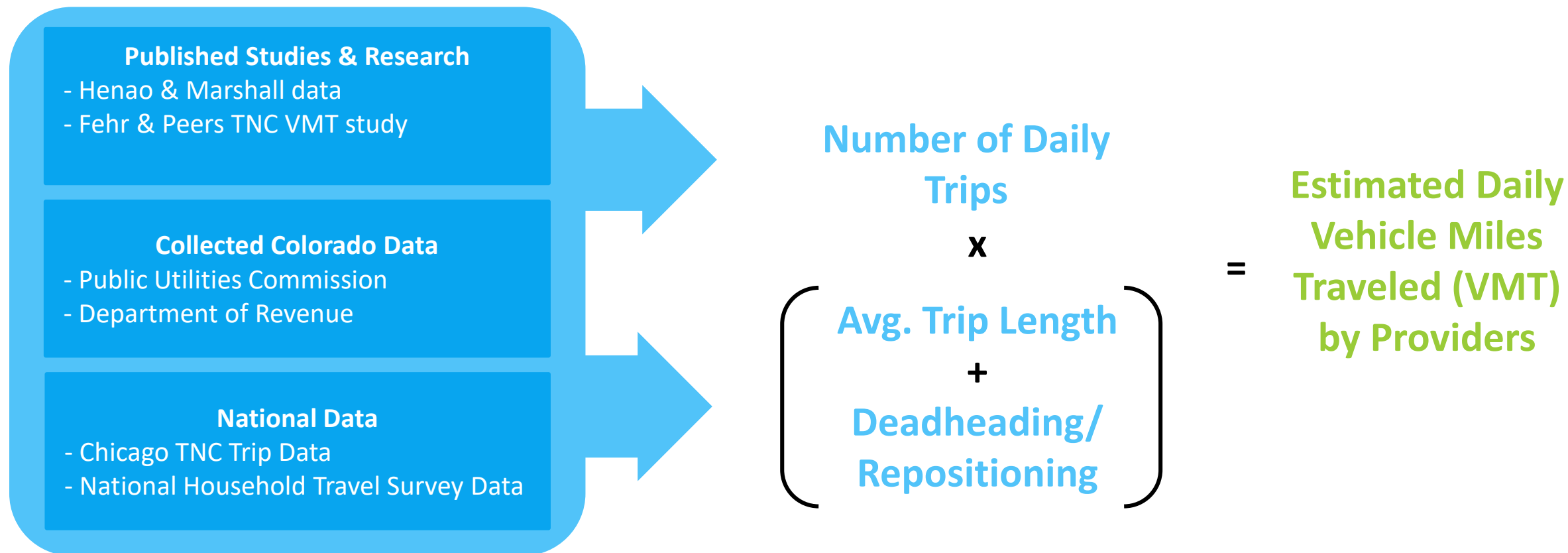
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## Statewide Travel Demand Model: *StateFocus*



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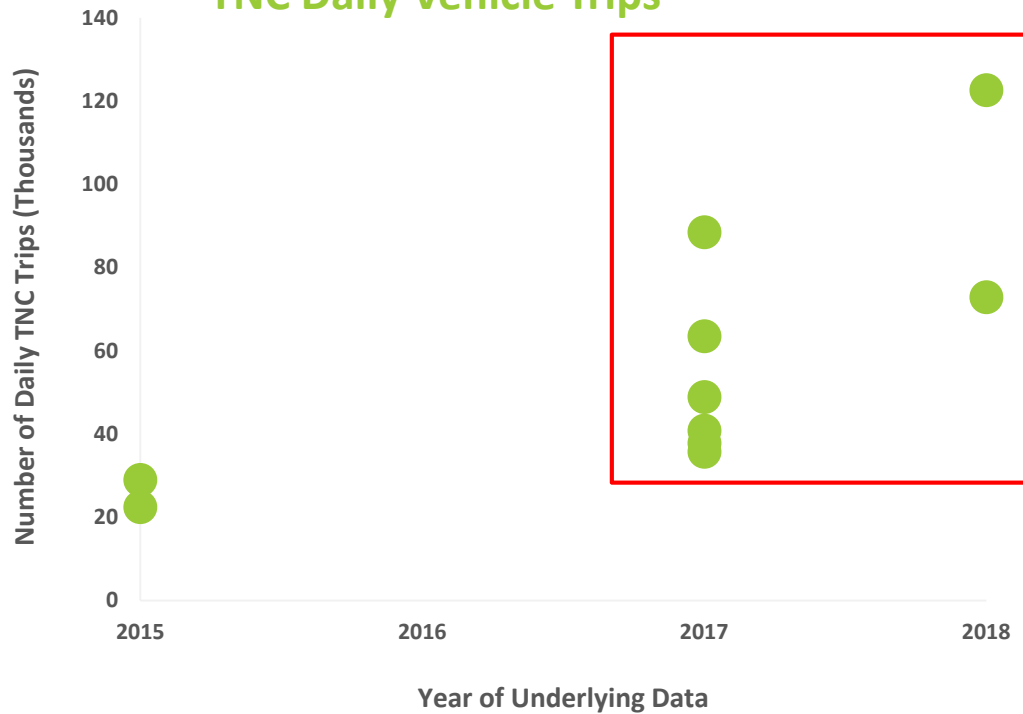
## State Focus Model: VMT Forecasting Methodology



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# Transportation Network Companies (TNC) – Trip Methodology

## Estimates of Colorado TNC Daily Vehicle Trips



## 2018 TNC Trip Estimate Methodology

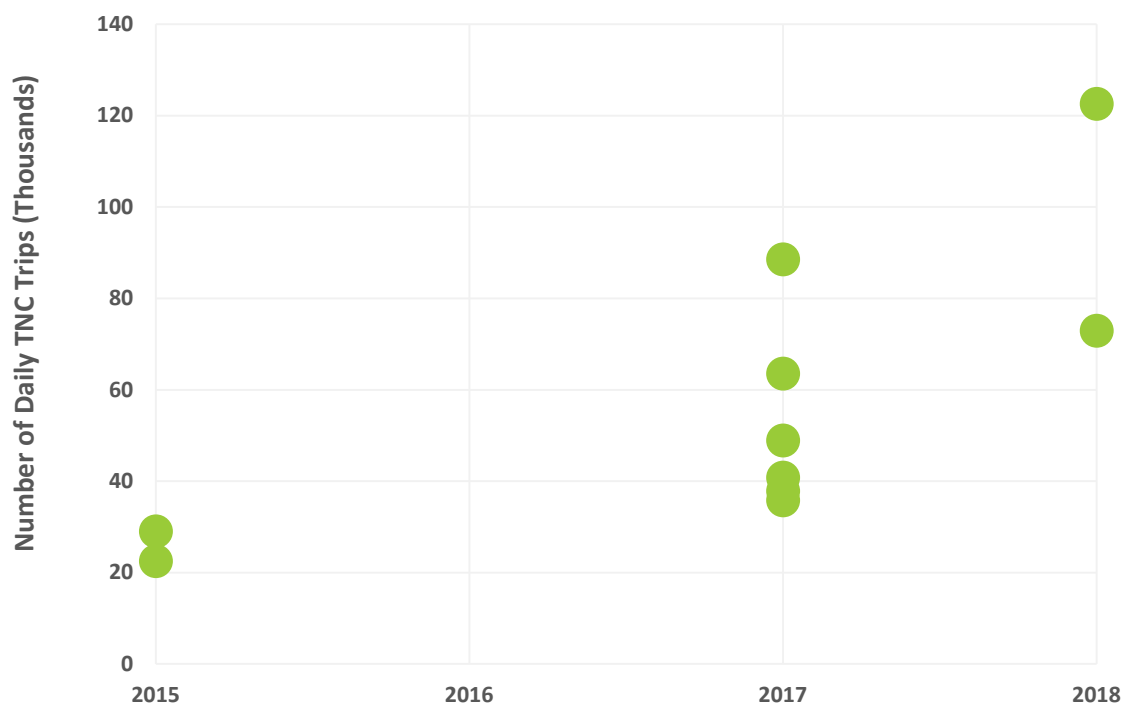
Key Metric	National Observed Data Range	Colorado Estimates		
		Best Estimate	Low	High
Number of Daily Trips		63k	38k	120k
Avg. Passenger Trip Length	3-8 miles	7 miles	n/a	n/a
Deadheading (% of total VMT)	20-50%	41%	n/a	n/a
Total Daily VMT		743k	448k	1.4m

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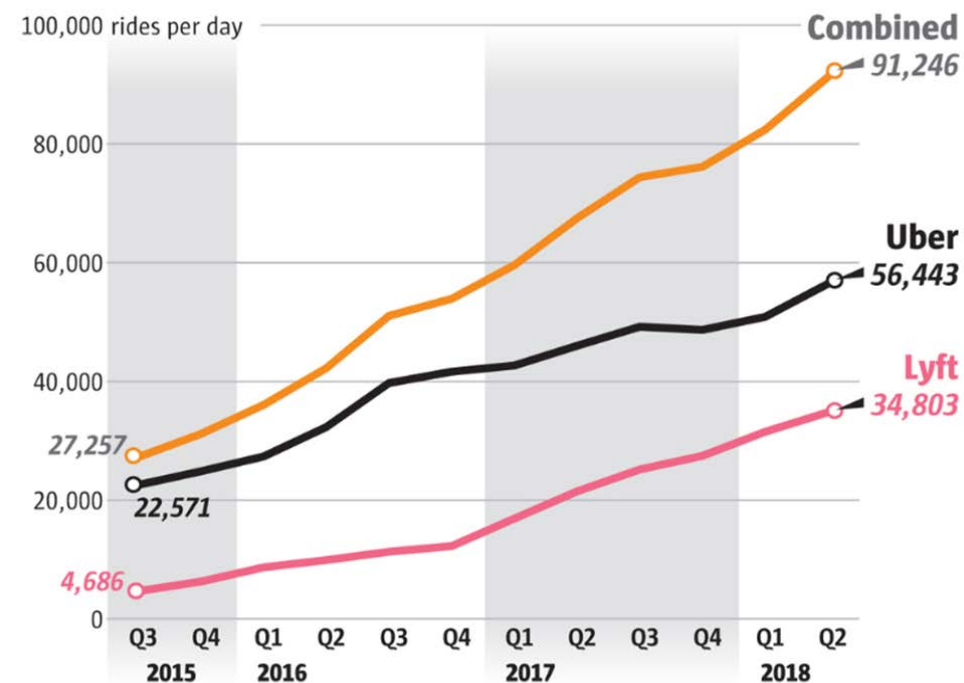


## TNC Trip Trends Comparison

### Estimates of Colorado TNC Vehicle Trips



### 2015-2018 Seattle TNC Trip Trends



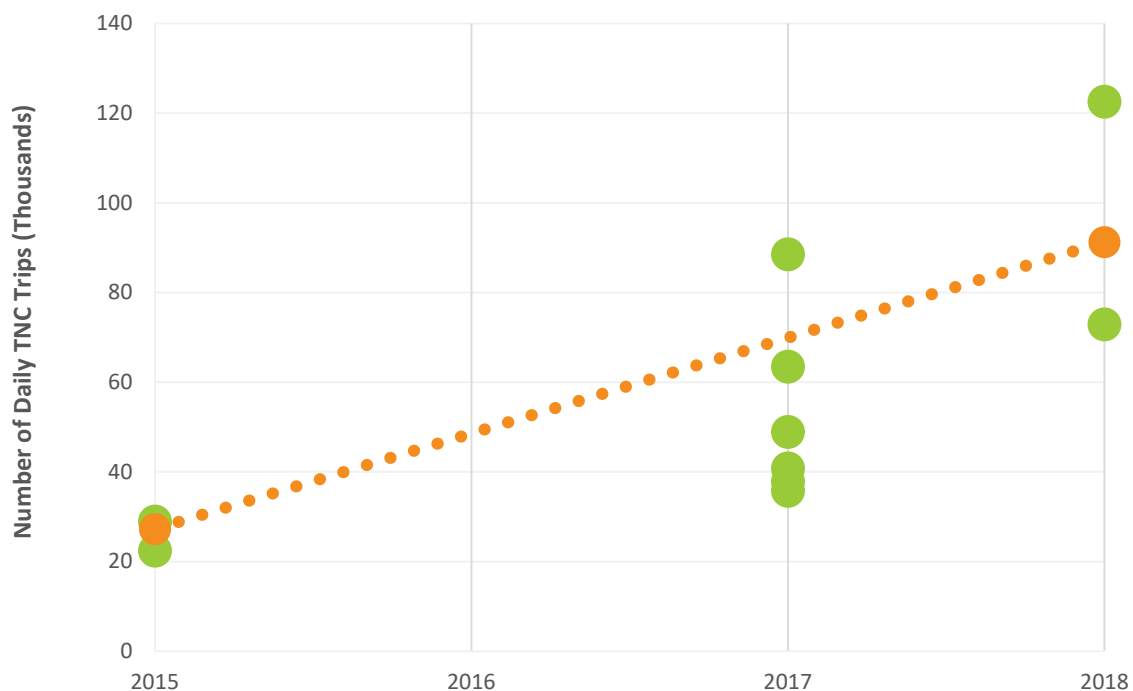
Source: Uber and Lyft quarterly reports to the city of Seattle

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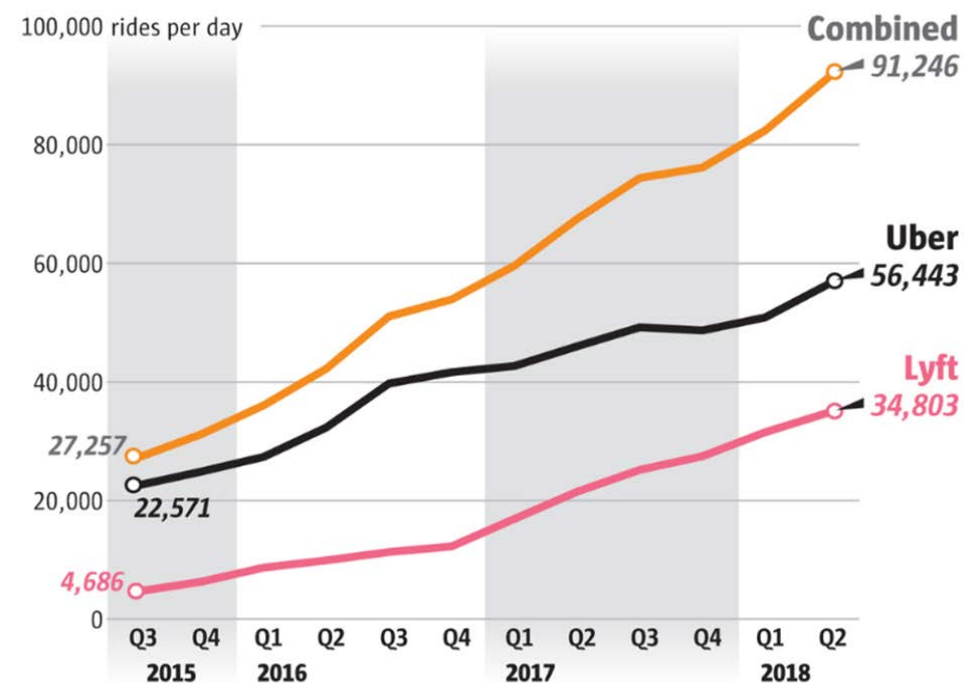
# TNC Trip Trends Comparison

## Estimates of Colorado TNC Vehicle Trips



● Estimates of Colorado TNCs ● Seattle TNCs ● ● ● Linear (Seattle TNCs)

## 2015-2018 Seattle TNC Trip Trends



Source: Uber and Lyft quarterly reports to the city of Seattle

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## Transportation Network Companies (TNC) – Trip Estimates

### Assumptions

### 2030 Forecasted Daily Trip Estimates

2030 TNC market in Colorado is roughly the same mode share with similar travel characteristics as today

80k - LOW

**2030 TNC market in Colorado is similar to mode shares observed in Chicago region today**

**315k - BEST**















2030 TNC market in Colorado is similar to mode shares observed in San Francisco today

850k - HIGH

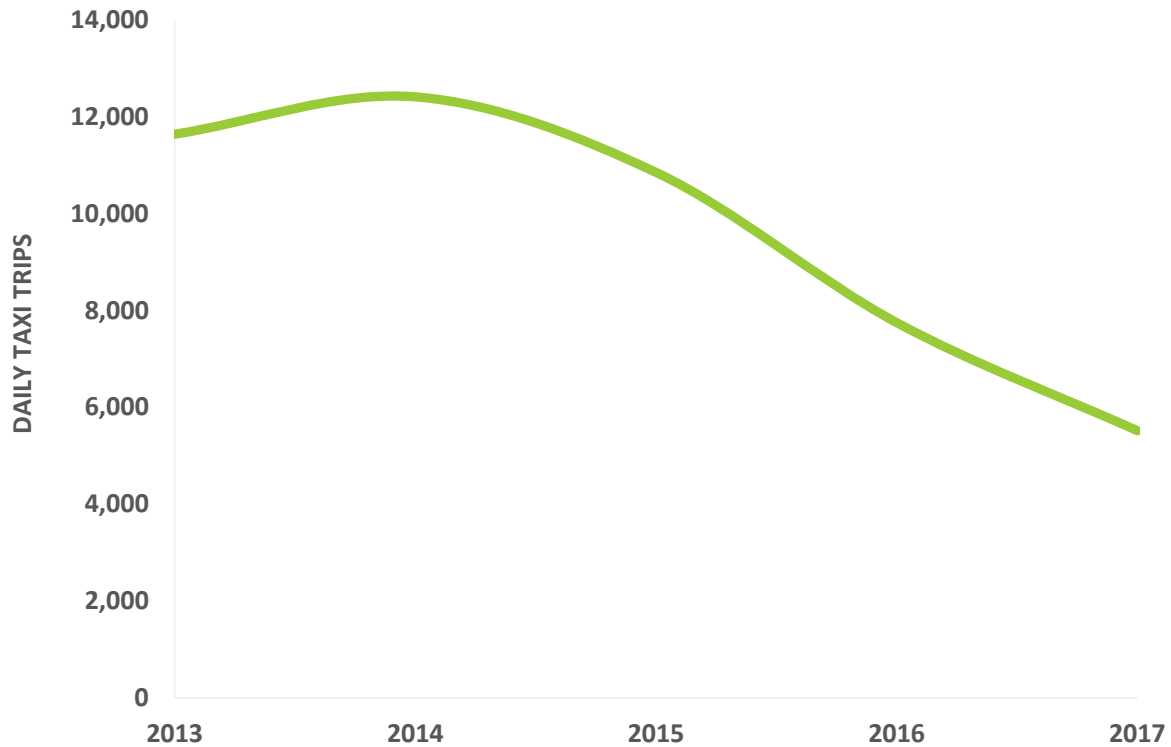
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## Car Share – Trip Estimates

Key Metric	Best Estimates 2018				High Estimate of Total Carshare	Best Estimates 2030				High Estimate of Total Carshare
	Non-peer Carshare		Peer Carshare	Non-peer Carshare		Peer Carshare				
	car2go	Zipcar		car2go			Zipcar			
Number of Daily Trips	1,700 	50 	100 		10k	2,200 	100 	200 		55k
Avg. Passenger Trip Length	7 miles 	15 miles 	15 miles 		50 miles	7 	15 	15 		50
Repositioning	3%	0%	0%		0%	3%	0%	0%		0%
Total Daily VMT	12k	1k	2k		500k	15k	1k	3k		2.8m

## Taxi - Trip Estimates

Observed taxi trip data from Colorado PUC, 2013-2017

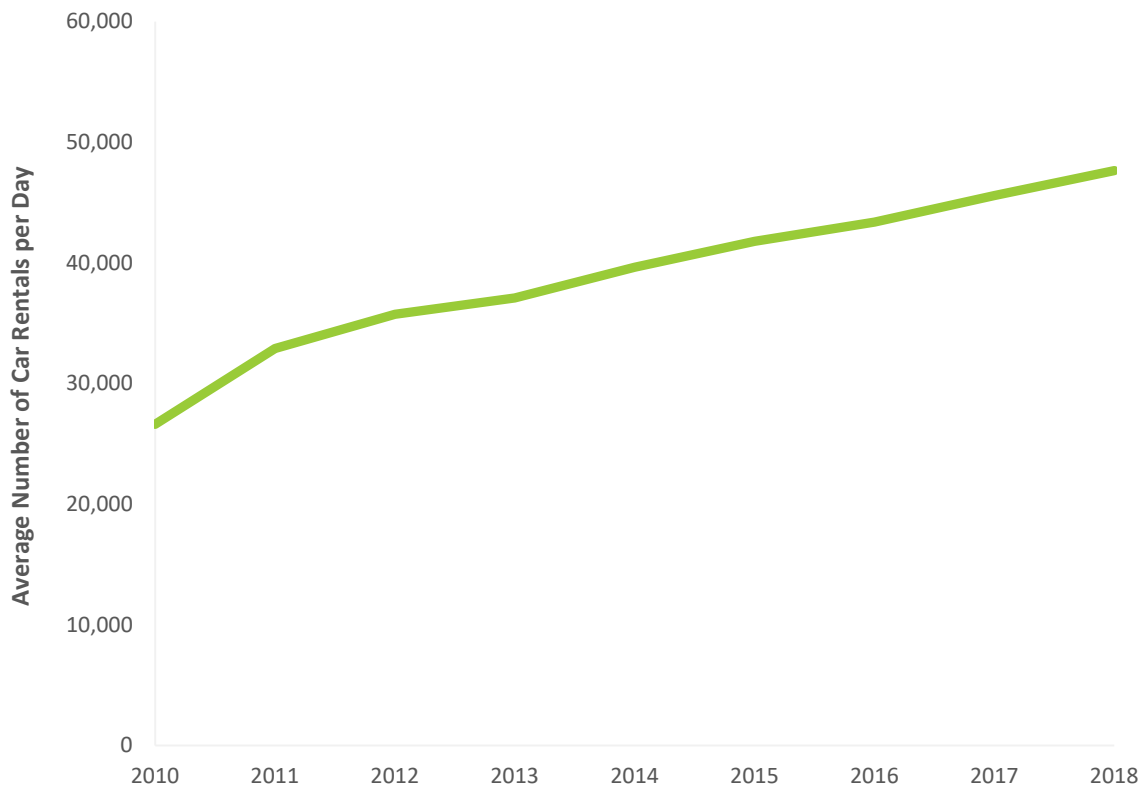






Key Metric	2018		2030		
	Best Estimate	High	Best Estimate	Low	High
Number of Daily Trips	5k	7k	7k	0	8k
Avg. Passenger Trip Length	5 miles				
Deadheading (% of total VMT)	50%				
Total Daily VMT	50k	70k	70k	0	80k

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## Car Rental – Trip Estimates

Observed Rental Car Trip Data from  
Dept of Revenue, 2010-2018



Key Metric	2018		2030		
	Best Estimate	Range	Best Estimate	Low	High
Number of Daily Trips	48k		75k	60k	80k
Avg. Passenger Trip Length	65 miles 	25-150 miles	65 	25 	150 
Deadheading (% of total VMT)	0%				
Total Daily VMT	3M	1m-7m	5m	1.5m	12m

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## Residential Delivery - Assumptions

### ■ Residential Delivery Data Sources

- Placeholder estimates until data are available
- NHTS 2017
- Rodrigue 2017
- CO population
- Anecdotal information

### ■ Residential Delivery Trip Types

- 3<sup>rd</sup> party restaurant delivery
  - DoorDash, UberEats,
- Online grocery delivery
  - Instacart, Shipt, King Soopers
- E-commerce delivery
  - USPS, UPS, FedEx, Amazon

### ■ Residential Delivery Assumptions

- 3<sup>rd</sup> party restaurant delivery: 4,190 restaurants; 8 orders per day; 5 miles per delivery.
  - 34,000 daily deliveries in 2018 and 301,000 daily deliveries in 2030
- Online grocery delivery: 1.5 grocery trips/HH/week; 3% online orders in 2018 and 9% in 2030; 4 miles per delivery
- E-commerce delivery: 0.095 deliveries/person/day; 0.23 to 0.58 miles per package

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## Residential Delivery – VMT Estimates

### ■ Data Source





- Anecdotal information
- NHTS 2017
- Rodrigue 2017

### ■ Residential Delivery Type

- Third-party restaurant delivery (33.7K daily)
- Online grocery delivery (14.7K daily)
- E-commerce parcel delivery (517.7K daily)

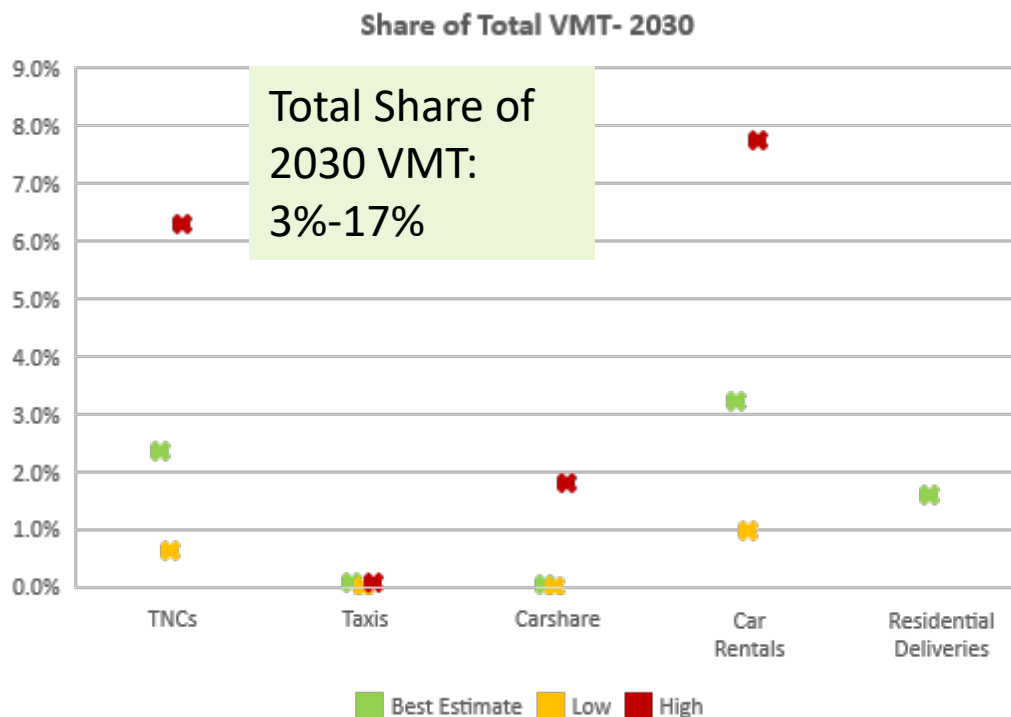
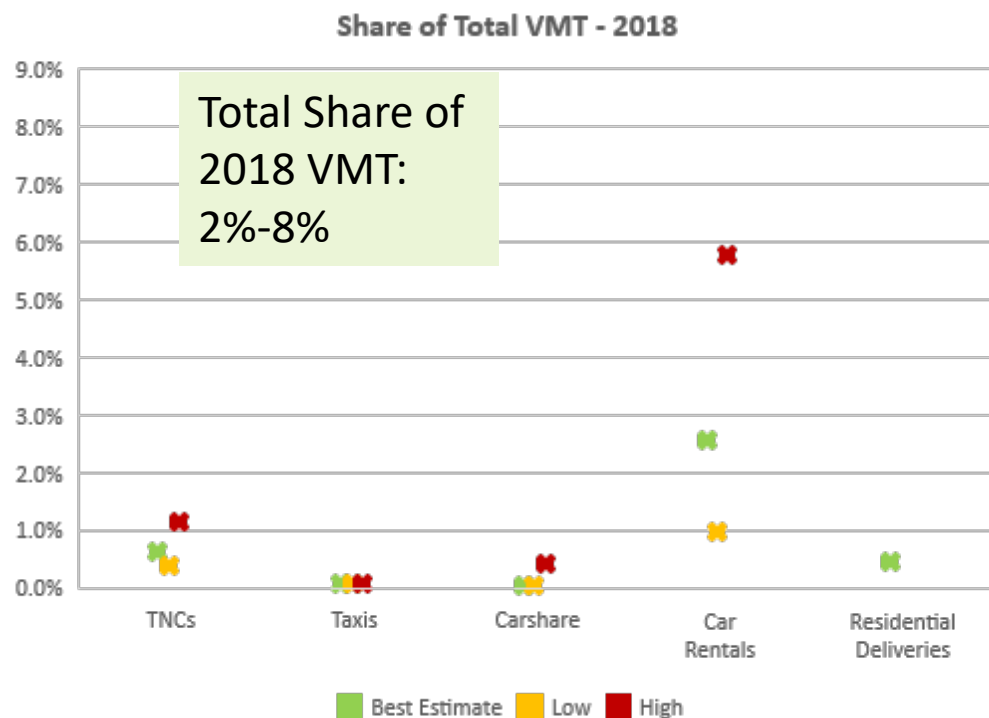
### ■ Placeholder

- Educated guess
- Need more, better data

Metric	2018	2030
	Best Estimate	Best Estimate
Number of Daily Deliveries	566,000 	1,407,000 
Average Trip Length	1 mile 	2 miles 
Deadheading (% of total VMT)		
Total Daily VMT	565,000	2,523,000

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# Emerging Mobility Providers Share of Total Statewide VMT



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## Emerging Mobility Providers Statewide and MPO Share of Daily VMT

Mode	2018			2030		
	VMT	Share of Statewide VMT	Share of MPO VMT	VMT	Share of Statewide VMT	Share of MPO VMT
TNC	748,000	0.6%	0.7%	3,700,000	2.3%	2.9%
Taxi	53,000	0.0%	0.1%	66,700	0.0%	0.1%
Non-peer Carshare	13,000	0.0%	0.0%	15,000	0.0%	0.0%
Peer Carshare	2,000	0.0%	0.1%	4,000	0.0%	0.0%
Car Rental	3,153,000	2.5%	3.0%	5,060,700	3.2%	4.0%
Residential Delivery	565,000	0.5%	0.5%	2,523,200	1.6%	2.0%
<b>Subtotal</b>	<b>4,530,000</b>	<b>3.6%</b>	<b>4.3%</b>	<b>11,370,200</b>	<b>7.2%</b>	<b>8.9%</b>
Statewide Total*	124,200,000			158,267,000		
MPO Total*	104,896,000			127,580,000		

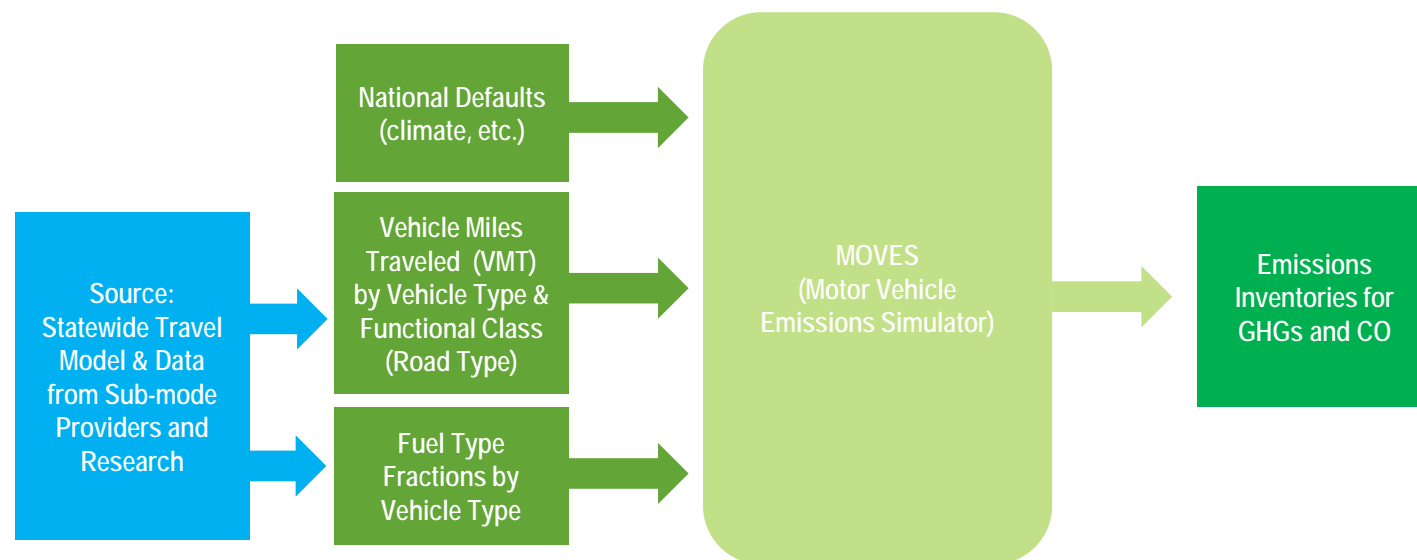
\* Does not include trucks

The MPO area is comprised of the total of the five MPO areas

## Emissions Forecasting Tool: MOVES

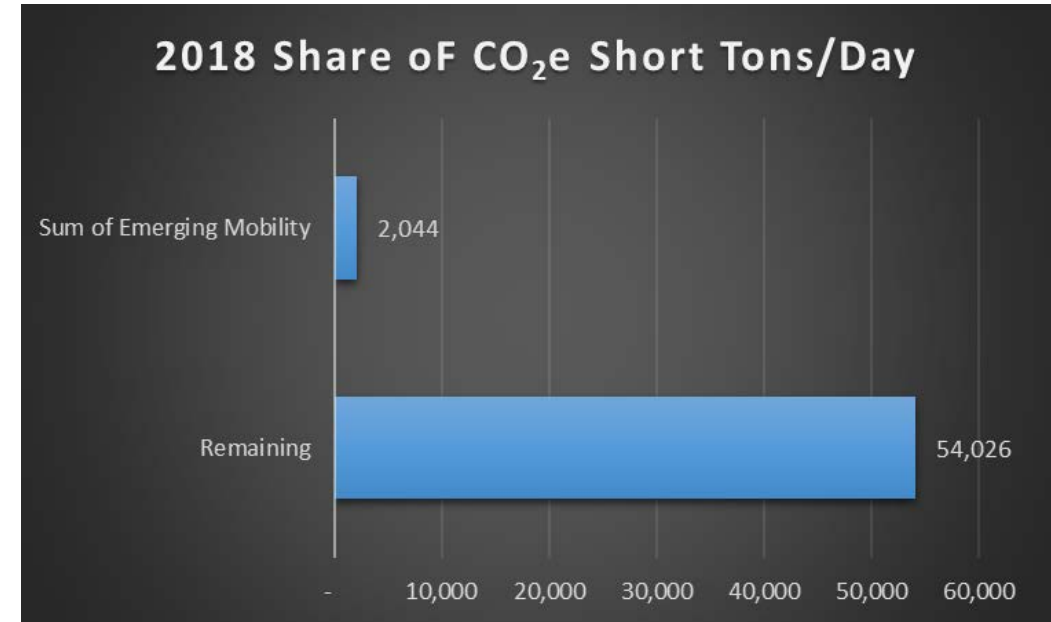
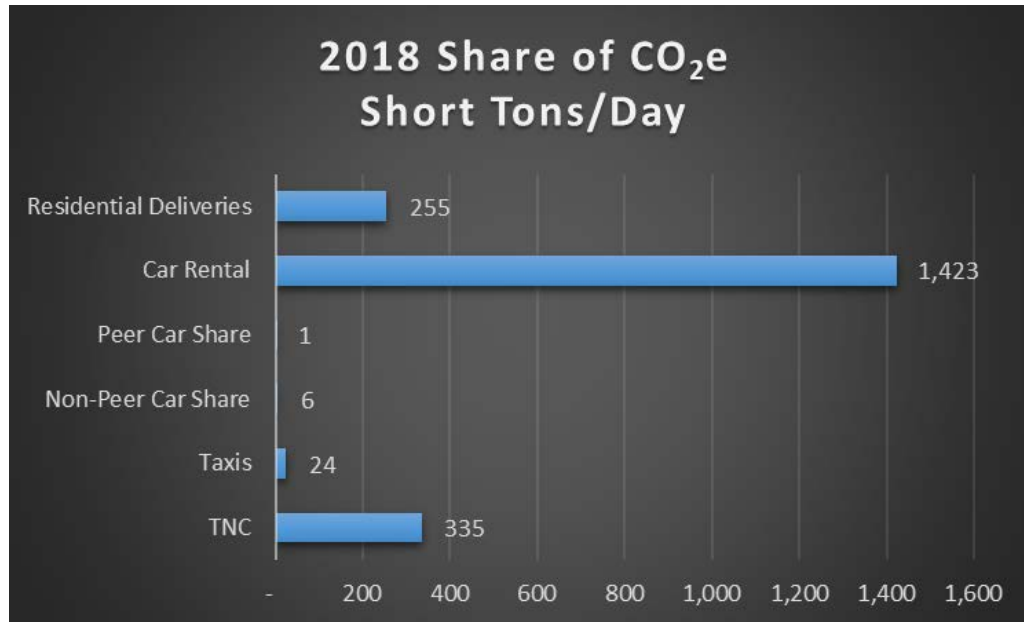
- EPA MOVES Model

- Model for estimating mobile source emissions and green house gases
- Ran MOVES at national scale
  - Default settings
  - Weekdays in January and July; results averaged
- For 2030, ran MOVES at national scale
  - But MOVES VMT reconciled against StateFocus Model VMT estimates

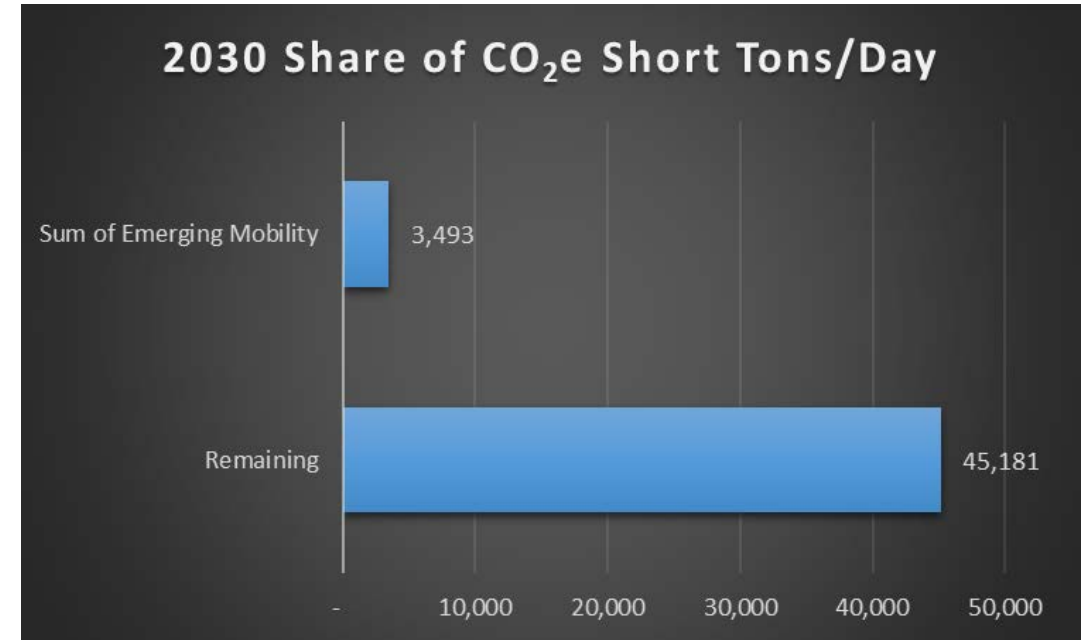
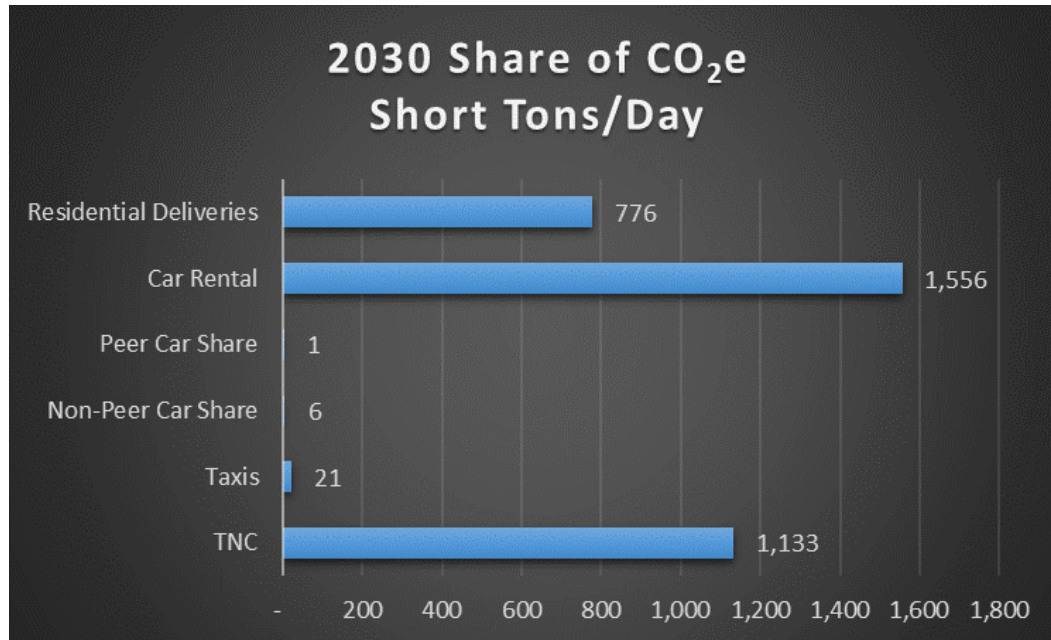


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## Carbon Emissions Modeling (2018)



## Carbon Emissions Modeling (2030)



## Baseline Emissions Summary

- Sum of the emerging mobility emissions increase from 2,044 to 3,493 short tons per day (assuming no fees)
  - TNCs carbon emissions increase from 335 to 1,133 short tons per day (more than triple)
  - Residential delivery carbon emissions increase from 225 to 776 short tons per day (more than triple)
- Overall carbon emissions statewide is forecast to decrease from 56,070 tons to 48,674 short tons per day because of CAFE standards

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## Fee Structure Analysis

- Mileage Based
- Flat
- Percentage of Transaction

Vehicle type	Mileage-Based Fee (\$ per vehicle mile)		Flat Fee (\$ per trip or day)		Percent-Based Fee (percent of transaction)	
	Low	High	Low	High	Low	High
ICE, single occupancy	\$0.01	\$0.015	\$1.00	\$2.50	3%	5%
Pooled ride or ZEV	\$0.005	\$0.01	\$0.50	\$1.40	1%	2%
Pooled ride and ZEV	\$0	\$0.005	\$0.00	\$0.10	0%	1%

Note: Pooled ride fee structures were only estimated for TNCs

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## Behavior Change Estimation: Elasticity Methodology

- Elasticity of demand for estimating impact of fee structures
  - Percent change in trips for every percent change in fares
  - Estimate revenue based on trips or VMT with fees
- Literature review of emerging modes travel behavior and responsiveness to price changes
  - Wide range of elasticities
  - Price responsiveness may be linked to trip purpose
  - Differences in price responsiveness by emerging mode is unclear
  - No evidence of difference in responsiveness for urban vs. rural areas, or for low emission vehicles
- Year of analysis is 2030
- Dollar values are in undiscounted, today's (2019) dollars

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## Elasticity Assumptions

- A constant elasticity for all price changes and all modes
- Customers must perceive the price change in their travel cost
- No shifts in demand between modes with fee structure
- Trip lengths do not change with fee structure
  
- Not enough evidence in literature to assume:
  - Different elasticities for emerging modes
  - Different elasticities for discretionary trips vs. necessary trips
  - Different elasticities for ICE and low emission vehicles
  - Different elasticities for urban and rural markets

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## Fee Scenario Results for 2030

- Two demand response scenarios:
  - Demand is more responsive to changes in price, assuming a relatively more elastic demand for emerging modes (-1.0)
  - Demand is less responsive to changes in price, assuming a relatively less elastic demand for emerging modes (-0.3)
- VMT, Emission, and Revenue Impacts for 2030 by:
  - Emerging mobility type
  - Fee structure type

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## TNC – Single Rides in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily)</b>	273,143	267,815	271,385	270,317	223,561	260,157
<b>2030 VMT (daily)</b>	3,197,519	3,135,145	3,176,936	3,164,439	2,617,091	3,045,499
<b>Percent Change from 2030 Baseline</b>	-0.3%	-2.2%	-0.9%	-1.3%	-18.4%	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	983	964	977	973	805	937
<b>Value of daily reduced emissions (2019\$, undiscounted)</b>	\$2.4	\$20.5	\$8.4	\$12.0	\$171.2	\$46.6
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$11,670,943	\$97,752,436	\$40,455,962	\$17,325,305	\$203,999,374	\$64,637,006

Flat fee structure generates the largest decrease in VMT (the flat fee represents a 7 to 18 percent increase in the single ride base fare).

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## TNC – Pooled Rides in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily)</b>	40,775	40,207	40,728	40,349	34,849	40,033
<b>2030 VMT (daily)</b>	477,330	470,684	476,777	472,337	407,958	468,647
<b>Percent Change from 2030 Baseline</b>	-0.2%	-1.6%	-0.3%	-1.2%	-14.7%	-2.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	147	145	147	145	125	144
<b>Value of daily reduced emissions (2019\$, undiscounted)</b>	\$0.3	\$2.2	\$0.4	\$1.7	\$20.4	\$2.8
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$871,128	\$7,337,866	\$1,416,661	\$1,724,031	\$17,807,938	\$2,785,011

Uses the “pooled ride” tier of the fee structure. Flat fee structure generates the largest decrease in VMT (the flat fee represents a 5 to 15 percent increase in the pooled ride base fare).

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## Peer to Peer Car Share in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily reservations)</b>	199	196	198	197	168	190
<b>2030 VMT (daily)</b>	3,587	3,530	3,568	3,537	3,021	3,420
<b>Percent Change from 2030 Baseline</b>	-0.3%	-1.9%	-0.9%	-1.7%	-16.1%	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	1	1	1	1	1	1
<b>Value of daily reduced emissions (2019\$, undiscounted)*</b>	\$0.0	\$0.0	\$0.0	\$0.0	\$0.2	\$0.1
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$13,094	\$71,590	\$33,717	\$19,367	\$153,132	\$53,870

\*Note: percentage and dollar values listed as zero are not exactly zero, but are less than 0.01 percent and one cent, respectively.

Flat fee structure generates the largest decrease in VMT (the flat fee represents a 6 to 16 percent increase in the daily reservation cost).

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## Non Peer to Peer Car Share in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily reservations)</b>	2,194	2,126	2,180	2,169	1,587	2,090
<b>2030 VMT (daily)</b>	18,349	17,784	18,234	18,143	13,269	17,480
<b>Percent Change from 2030 Baseline</b>	-0.3%	-3.3%	-0.9%	-1.4%	-27.9%	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	6	5	6	6	4	5
<b>Value of daily reduced emissions (2019\$, undiscounted)*</b>	\$0.0	\$0.2	\$0.0	\$0.1	\$1.5	\$0.3
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$66,972	\$776,130	\$214,029	\$99,330	\$1,447,700	\$341,957

Flat fee structure generates the largest decrease in VMT (the flat fee represents an 11 to 28 percent increase in the daily reservation cost).

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## Taxi in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily)</b>	6,890	6,796	6,838	6,850	6,031	6,555
<b>2030 VMT (daily)</b>	66,603	65,692	66,100	66,213	58,299	63,365
<b>Percent Change from 2030 Baseline</b>	-0.1%	-1.5%	-0.9%	-0.7%	-12.6%	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	20	20	20	20	18	19
<b>Value of daily reduced emissions (2019\$, undiscounted)</b>	\$0.0	\$0.3	\$0.2	\$0.1	\$2.4	\$1.0
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$243,099	\$2,480,437	\$1,486,269	\$362,515	\$5,503,271	\$2,374,631

Flat fee structure generates the largest decrease in VMT (the flat fee represents a 5 to 13 percent increase in the base fare).

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## Car Rental in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percent-Based Fee	Mileage-Based Fee	Flat Fee	Percent-Based Fee
<b>2030 Trips (daily reservations)</b>	76,150	76,023	75,712	75,152	73,261	72,580
<b>2030 VMT (daily)</b>	5,044,173	5,035,749	5,015,154	4,978,064	4,852,778	4,807,665
<b>Percent Change from 2030 Baseline</b>	-0.3%	-0.5%	-0.9%	-1.6%	-4.1%	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	1,551	1,549	1,542	1,531	1,492	1,479
<b>Value of daily reduced emissions (2019\$, undiscounted)</b>	\$4.8	\$7.3	\$13.2	\$24.0	\$60.5	\$73.6
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	\$18,411,231	\$27,748,514	\$50,446,457	\$27,254,900	\$66,850,712	\$80,598,947

Percentage-based fee structure generates the largest decrease in VMT (the flat fee only represents a 2 to 4 percent increase in the daily reservation cost).

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## Residential Delivery in 2030

	Low End Impact Low Fees & Less Responsive Demand			High End Impact High Fees & More Responsive Demand		
	Mileage-Based Fee	Flat Fee	Percentage-Based Fee	Mileage-Based Fee	Flat Fee	Percentage-Based Fee
<b>2030 Trips (daily)</b>	n/a	n/a	1,393,531	n/a	n/a	1,335,878
<b>2030 VMT (daily)</b>	n/a	n/a	2,500,518	n/a	n/a	2,397,066
<b>Percent Change from 2030 Baseline</b>	n/a	n/a	-0.9%	n/a	n/a	-5.0%
<b>2030 CO<sub>2</sub>e Emissions (tons, daily)</b>	n/a	n/a	769	n/a	n/a	737
<b>Value of daily reduced emissions (2019\$, undiscounted)</b>	n/a	n/a	\$6.6	n/a	n/a	\$36.7
<b>Annual Revenue for 2030 (2019\$, undiscounted)</b>	n/a	n/a	n/a	n/a	n/a	n/a

Impacts from mileage-based and flat fee structures cannot be estimated without an assumption of representative base costs for residential delivery.

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## Effect of Incentives on TNC Adoption of ZEVs

- Colorado Energy Office EV Growth Analysis
- EV Adoption Rates: “Business as Usual” compared to ZEV+ Scenario\*

2030 TNC Emissions	Daily CO <sub>2</sub> e (short tons)
2030 Baseline	1,133
2030 “Business as Usual”	1,026
2030 “ZEV+ Scenario”	1,007

Assumes TNC fleet ZEV adoption rate same level as overall population

\*Navigant Report, June 2019

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## Questions and Answers

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## Definitions of Providers

Provider	Definition	Examples
Transportation Network Company	A company that relies upon a mobile application to pair drivers with riders, as defined in Section 40-10.1-602 (3).	Uber, Lyft, Hop Skip Drive
Peer Car Share	A car sharing company that enables individuals to rent personal vehicles to others	Turo, Drift, Getaround, Maven
Car Clubs: Non-Peer Car Share	A car sharing company that operates a fleet of vehicles for use by individuals	Streetcar, ZipCar, Share Now, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz
Taxi	A company that provides taxicab service, as defined in Section 40-10.1-101 (19)	Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative
Car Rental	A company that rents vehicles to individuals	Enterprise, Avis, Hertz, Budget
Residential Delivery Services	A company that delivers goods to residential addresses with a vehicle having a gross vehicle weight rating under 14,000 lbs.	Uber Eats, Door Dash, UPS, Fed Ex, King Soopers residential, Amazon Delivery Service Partner, AmazonFlex

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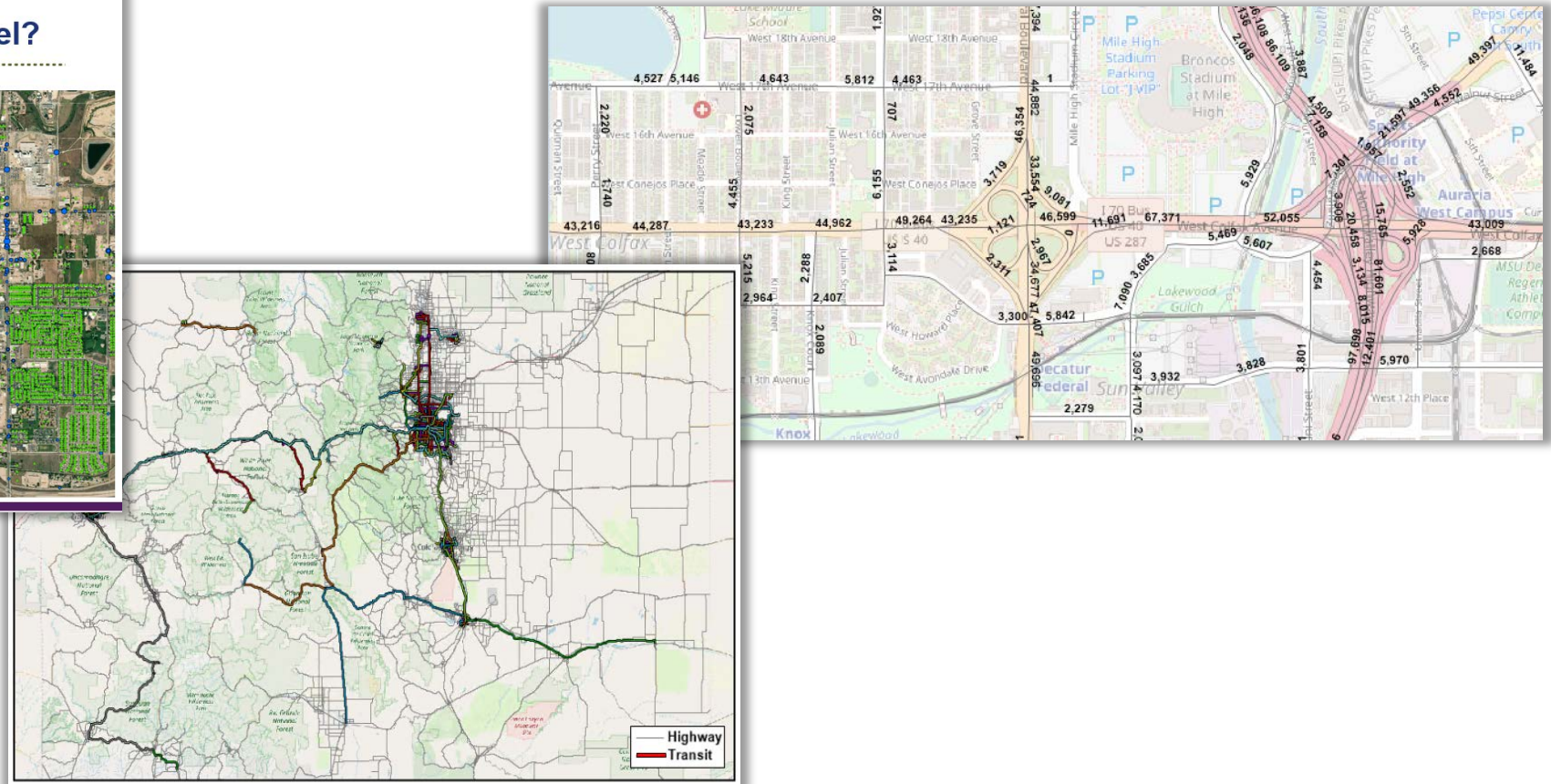
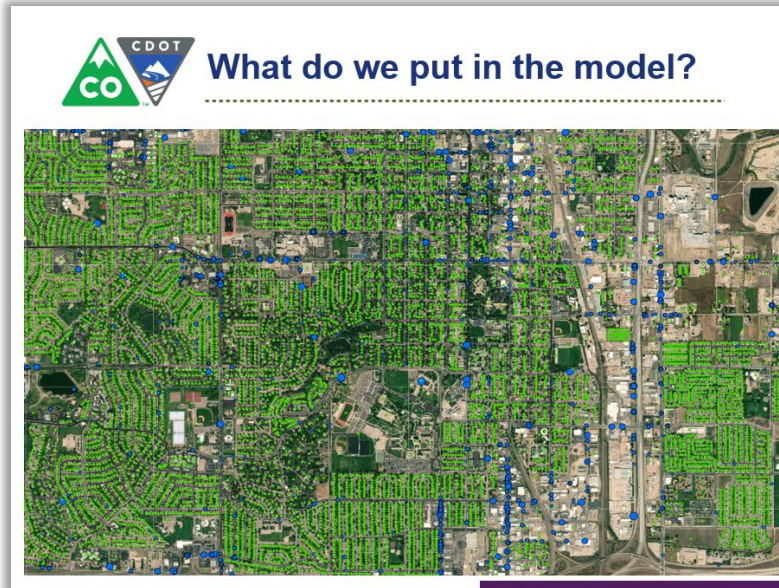


## Definition of CO<sub>2</sub>e

Carbon dioxide equivalent or CO<sub>2</sub>e means the number of metric tons of CO<sub>2</sub> emissions with the same global warming potential as one metric ton of another greenhouse gas, and is calculated using Equation A-1 in 40 CFR Part 98.

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# StateFocus Model: Inputs and Outputs



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APPENDIX B

WORKING GROUP MEMBERSHIP AND MATERIALS

**SWG Meeting 4 Notes  
and Presentation  
October 24, 2019**



## **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

**Meeting # 1 June 28, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

### **Stakeholder Working Group Member Attendance:**

Alejandro Henao - NREL	Jonathan Bartsch - CDR and Associates
Amanda Brimmer - RAQC	Kristin Sullivan - Adams County
Andrew Sand - CEO	Lily Lizarraga - CDOT
Ashley Nysten - CDOT	Lisa Streisfeld - CDOT
Bruce Abel - RTD	Lou Davenport - Iron Stride Solutions
Carla Perez-HDR	Manolo Morales - Drift
Cassandra Sulmeisters - E-70	Maria Eisemann - CEO
Celeste Stagand - Ford	Mary Marchun - The Capstone Group LLC.
Chaz Tedesco - Commissioner, Adams County	Matthew Frommer - SWEEP
Chris Hansen - House District 6 Representative	Michael King - CDOT
Christian Williss - CEO	Michelle Bina - Cambridge Systematics
Christopher Primus - HDR	Nick Farber - HPTE
Daniel Hutton - Denver South Economic Development Partnership	Piper Overstreet-White - Uber
David Spector - KPMG	RJ Harrington - National Car Charging
Diego Lopez - Northern Colorado Clean Cities	Robert William - Orrick Law Firm, Getaround Inc.
Doug Rex - DRCOG	Scott McCarey - Boulder County
Elise Jones - Boulder County	Shoshana Lew - CDOT
Ethan Wilson - Turo	Simon Logan - HPTE
Greg Fulton - FRAC	Sophie Shulman - CDOT
Jake Swanton - Lyft	Stan Young - NREL
Jeff Cleland - Amazon	Sydney Lund - CDOT
Jenny Adler - DOR/DMV	Totsy Rees - CDOT
Johanna Jamison - SHARENOW	Travis Madsen - SWEEP
John Featherstone - CDOT	Walter Rosenkranz - SHARENOW
John Hennelly - Teamsters Local 445	Will Toor - CEO

## **1- Introduction and Updated**

### **Welcome and Introductions**

Jonathan Bartsch - Welcome to the fourth stakeholder meeting for the Emerging Mobility Impact Study. We will go around the room and have all of the stakeholders please state their name and their company affiliation.

All of the stakeholders introduced themselves.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting #4 October 24, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

Jonathan Bartsch - Today is the opportunity where we put together the recommendations and try to make sense of the work that has been completed within subcommittees and within the previous three stakeholder working groups. This meeting is intended to be the culmination of a lot of hard work. Just from where I have participated, the amount of work, discussion, passion, and detail that has been shared has been really remarkable.

Jonathan Bartsch - Today we would like to get your perspective on those recommendations presented from each of the subcommittees and talk about the report. Today is the opportunity to pull together the recommendations, the great work coming out of subcommittees, and to get perspective to be included within the final report.

### **Adoption of Meeting Notes from September 26, 2019**

Jonathan Bartsch - The meeting notes from the Stakeholder Working Group Meeting number three, which took place on September 26th, have been uploaded to the shared Google Drive Folder. These meeting notes will be a part of the record. We would like to adopt these meeting notes today. Are there any comments on the notes or anything that needs to be changed?

Greg Fulton - I have a few changes to some of my remarks. I will send these remarks to the group via email to be updated within the meeting notes.

Jonathan Bartsch - The meeting notes and recorded webinar are all available within the shared Google Drive Folder. The document on incentives for shared ridership and barriers to trip sharing is also available for your review. In the shared Google Drive folder you can find the modeling webinar presentation and notes, the project schedule, the updated technical memo for the gap analysis, and the new technical memos. The new technical memos include Incentives to Shared Ridership and Congestion Management. Before we go into the draft report, is there anything that folks want to raise about today or the documents provided within the shared Google Drive folder?

No comments were made by the Stakeholder Working Group members.

## **2 - Draft Report**

### **Review Content of the Different Chapters**

Lisa Streisfeld - Good afternoon. Tomorrow the report will be ready for all of you and it will be added to the shared Google Drive Folder. We wanted to incorporate the comments from the meeting today into Chapter 7 of the report. Here is an overview of the report:

1. First, there is an executive summary, followed by chapter one where we have a background on the study, which discusses SB 19-239.
2. Chapter Two discusses Emerging Business Models and Providers. Here we talk about the different types of emerging mobility business models and providers and also take a look at our current regulatory environment. Here we also included the economic impacts, environmental impacts, and the transportation impacts of these emerging mobility technologies.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting #4 October 24, 2019**

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3. Chapter Three is titled Data Collection and Research, which goes into our data collection and sources. This is also where the supporting documentation for the literature review from Colorado State University can be found.
4. Chapter Four discusses the Transportation Impact Analysis. This is the modeling of the existing vehicle miles traveled of the six different providers. It's the forecasted vehicle miles traveled through the six different providers to year 2030. Then we also looked at forecasts of emissions. This chapter also goes into the different types of service providers. It is divided up into our approach, what's going on within TNCs, car shares, taxis, car rental, and residential commercial delivery.
5. Chapter Five is titled Analysis, which goes through the analysis of the different fee structures. We're going to be presenting new and updated information on a revised fee structure today based on feedback we received from the modeling webinar and the Fee Subcommittee.
6. Chapter Six will be a summary of all the Subcommittee findings. The actual memoranda for each of those providers will be in the report and we have summarized this within the report.
7. Chapter Seven is a wrap up of all of the information and feedback we received from the stakeholders. This section talks about the policy recommendations, areas where we might need to do some research, and then next steps. So this is a prelude of the report for tomorrow, but I wanted everyone to have an understanding of what you're going to receive.

Jake Swanton - Will the document sent out tomorrow be the final copy or will have time to review this?

Lisa Streisfeld - The document sent out tomorrow will be in draft format. You can provide us with comments or other information by November 1st. You will have a whole week to submit your comments. This way, we can incorporate any of the data or comments provided into the final changes for the report.

David Spector - Where in the outline are we going to have a section that identifies things that are outside of the scope, such as gaps in data or things outside of the scope of the project that were discussed. Is there a section of the report that identifies this so that people know the impact and what is missing from the report?

Lisa Streisfeld - Yes, those are included under chapter 7.2.3, which includes items for additional research. Also in the policy recommendation there is a section where we call out the other items that we have discussed.

Jonathan Bartsch - In that section, the piece that you are talking about is how the revenue can be used and there is a lot of talk about that. Where does this go into the outline shown?

Lisa Streisfeld - Yes, one of the charges from the legislature was to focus on the fee structure. The part about recommendations for spending the revenue will be put into section 7.2.3.

Greg Fulton - Being that I represent that Freight Advisory Council, I don't see how the recommendations that we made or the letter was factored in. This doesn't seem to be a part of this report.

Jonathan Bartsch - That can be found in Chapter 7.1.



# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

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Greg Fulton - I am looking at the policy recommendation.

Sophie Shulman - These are included within the recommendation section and next steps section includes the specific letter from the Freight Advisory Council. In addition, when you look at the residential delivery section, there are certainly complementary elements in there. If you don't see enough included, I think that would be something you can mention in your emailed comments as well.

Greg Fulton - Ok, so these have been factored into the recommendations and suggestions of the report?

Lisa Streisfeld - Yes, in three places within the report. The first would be on the residential delivery, which includes the concerns that have been brought up in regards to how difficult it is to just quantify all that data and how delivery for groceries and pharmaceuticals is a little more sensitive. Secondly, in chapter seven, we have information and recommendations. The letter from the Freight Advisory Council is in Appendix J. The letter has also been uploaded to the shared Google Drive, so all of the stakeholders have access to this.

Greg Fulton - Thank you.

Jonathan Bartsch - A part of this meeting will discuss the recommendations that the stakeholder working group would like to include within the report to the legislature.

Jake Swanton - When the draft report to the legislature is uploaded tomorrow, will there be anything in that draft that we have not talked about within the stakeholder working group or within the subcommittees?

Lisa Streisfeld - I would say that most of the information has already been seen and is based on modeling. The one section that would include newer information is a research paper on shared ridership. We tasked HDR on how to get more people to do shared rides. This document provides more information and examples. The literature review has also been reformatted.

Chris Primus - I wanted to add that chapter 4 and 5 have a lot of information about the assumptions and the methods that we used to estimate travel, emissions, and revenues. There are a lot of details that have been written up in those sections that have not been able to be discussed in detail in our meetings.

Jake Swanton - Would we expect to see anything that we have not talked about? For example, would we expect to see anything that we have not talked about regarding the health certification that had not been either discussed within the subcommittees or within the stakeholder working group?

Lisa Streisfeld - This is all public information. We have included the information about Kentucky and Honolulu regarding this requirement (health certificate). There are no recommendations, just an inventory of the information for the facts and information related to both sides of the argument. Chapter 7 will have the summarization of the data and conversations. We talked a lot about the health certificate at the stakeholder working group number three. The recommendations from the working group will be in chapter seven.

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

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David Spector - Tomorrow we will get the report and the draft, but there will be no other stakeholder working group meeting after this information has been pulled together?

Lisa Streisfeld - Yes, that is correct.

Jonathan Bartsch - What I am getting is there are recommendations and other things to submit once the document is made available tomorrow. What I hear Lisa saying is that this document is a documentation of all of the input that has been discussed thus far.

Lisa Streisfeld - Yes, let me clarify, this report is a summary of the recommendations from the working group. This report is not containing CDOT's or the Office of Energy's own information or recommendations. It is a summary of the information and recommendations that have been discussed within the stakeholder working group and within the subcommittees.

Chaz Tedesco - Since this is the last meeting and the comments are due on November 1st, how will the comments be shared and addressed? How will the comments be added or not added to the final report?

Lisa Streisfeld - We will pull the comments that we receive by email and address the comments within the report. We will use a matrix which will state the comment and whether it has been added or not added. If a comment is not added, we will write an explanation for why it was not added.

Chaz Tedesco - Who is making the decision of which comments will and will not be added? Who decides what gets in and what does not get into the final report?

Lisa Streisfeld - Typically, we get a lot of comments and we collect them onto a documented matrix. As a project team, we will review the comments and have a comment resolution meeting. The document would also go through executive management review before being finalized.

Sophie Shulman - We do have a November 1st deadline within the legislature. We are doing the best we can to incorporate those comments in by the deadline provided.

Jonathan Bartsch - I think it is useful for us to talk about the substance of the recommendations and further discussion on where we are going from here.

### **Request comments on matrix by November 1, 2019**

Comments on the matrix and the draft report being sent to the legislature are requested to be received back to CDOT staff by November 1st.

## **3 - Colorado Fees and Taxes on Emerging Mobility**

### **Matrix on Inventory of Federal, State, and Local Examples of Fees and Taxes on Emerging Mobility**

# Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes

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Jonathan Bartsch - One of the things that we heard in multiple groups was regarding fees and understanding the whole landscape of state, federal, and local fees.

Lisa Streisfeld -(Going back to the report outline...Section 7.2 of this report is empty. We are waiting to write and finish that section to include the input from today's meeting. In the Google Drive and printed out in the room, we have a document which discussed the federal, state, and local fees on emerging mobility providers. A few things to note is that we tried to do a robust inventory on the taxation and fees. It's sorted by six different providers. It's also sorted by the federal, state, and local level.

The white boxes represent that the company is impacted by the fee or tax, the yellow/orange boxes represent that the fee impacts the customer, and the blue means that the fee or tax impacts the contracted driver. This gives you a good idea of the different types of fees that are out there. I am open to receiving comments.

Sophie Shulman - If you see anything that is not correct for your company, please let us know.

Bruce Abel - Is this the place to make any edits or comments?

Jonathan Bartsch - This is the time and place to highlight what might be wrong and then make sure to follow up in writing after the meeting.

Bruce Abel - Related to the concept within the RTD Sales District, the information related to the RTD sales tax is not correct. It says 1.1% for RTD here but that includes the 0.1% for the Scientific and Cultural Facilities District. That's already listed above, so the RTD should just be 1%.

Jonathan Bartsch - That is the type of feedback that we needed. We want your eyes on any of the corrections. Please submit the comments by the first of November. We did a shortened version of the modeling webinar within the fees subcommittee. We will also have a short presentation now regarding the modeling webinar.

## 4 - Highlights of the Modeling Webinar

### Modeling approach for VMT, Emissions, Elasticities

Chris Primus - Thank you to those who attended the modeling webinar. I will briefly go over what we did there. The modeling was an exploratory experience for this study. We investigated a variety of scenarios for planning purposes. This is not a recommendation, just information for the report. We went through the detailed process within the webinar. We used the statewide travel demand model (called the state focus model) to set a baseline of travel in the state for 2018 and 2030.

### 2030 Forecast for VMT, Emissions, and Revenue Generation

Chris Primus - We focused on the six providers that are the new mobility emerging providers outlined within the Senate Bill. We did not have a lot of information from the trips that those providers are conducting. We got the information that we could from literature reviews. We estimated the amount of

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

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emissions using the EPA MOVES model. Then we did an analysis of the different fee structures and fee rates.

We will look at that in more detail today. That is how our revenues projections are provided. When we started this process we needed to start with something. We looked at the results of the fee. The amount of money varies by the fee structures. As many of you commented, the amount of revenue generated by the different fee structures varied widely. So there was a call to normalize those results amongst fee structures. What you're looking at here is a new set of numbers that we are using for planning purposes. These numbers are much lower for the most part than was assumed in the first round.

Here is the new set of numbers that we have identified for planning purposes. A single ride is a ride that is purchased in the same transaction, even if two people are in the car. This is opposed to pool rides where the TMC picks up a stranger on the way. If you look at the bottom row there, you can see that for the moment, the low revenues for each the fee structures is around \$10 million and under the high end results around \$30 million. So that's the result of numbers being normalized to. Why did we end up with \$30 million? This is an arbitrary number. In Colorado today, the fees imposed on rental cars generate about \$34 million annually. This was a general reference we used for the high end. The low end seemed reasonable for the \$10 million range.

The three different fees structures identified were, mileage-based, flat fee base, and percentage of fare based fee. The estimate was used to see which ridership will go down when the fee is imposed. We are just doing the low and high estimates for each fee structure. As the fee is imposed, the VMT is impacted. We modeled this for each of the six providers.

Representative Chris Hansen - I have a quick question. I am trying to put the VMT in line with the whole market. Can you help us understand how the model is related to the whole picture of VMT?

Chris Primus - As I recall, in 2030 this represents 2.3% of all VMT, excluding heavy trucks.

Bruce Abel - I have a data question. Does this translate into an average of 11.7 miles per TNC trips?

Chris Primus - I will refer to my colleague Michelle Bina, from Cambridge Systematics.

Michele Bina - Yes, that is correct.

Greg Fulton - I think you need to work into the model that a rise in VMT for one sector might lead to a decrease in VMT in another sector. This can be seen within the home delivery sector, where one car is dropping off five packages at a home, instead of a person driving to different stores to pick up all those items.

Chris Primus - We mentioned this offset factor in the report, but I will make sure it is well emphasized.

Travis Madsen - Where does this fit into the overall picture of statewide emissions?

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Chris Primus - This is also in the report, we have looked at some of the information and it is included within prior presentations.

Jake Swanton - In looking at 2030, how do you take into account TNCs innovation and TNCs being more efficient in decreasing deadheading, etc.?

Chris Primus - I've tried to emphasize that we have very limited data. We've done the best estimates as we can. There are potential trends that are possibly going to affect the amount of travel of VMT and amount of emissions such as those that you mentioned. But we don't have enough information to be able to project those. But it's good to be aware that trends such as these could affect the amount of travel activity in 2030.

Jake Swanton - You kept that contained and did not include that data in any of the models?

Chris Primus - Yes, that is correct.

Lou Davenport - Would it be possible to add the data into the chart?

Chris Primus - Sure, we can do that.

Greg Fulton - Did you factor in removing old vehicles with the newer technology and vehicles? The newer vehicles are clean and more efficient. When you change out vehicles into something that is more efficient. Or did you take the framework from today and span it out until 2030?

Chris Primus - Yes, this model does take into account that change in the fleet to reduce emissions. This is also explained in the report. Another thing to mention is that we did a couple of things since you have seen these numbers. One is a taking into account of EVs assumed adoption rate for 2030. This will also affect the emissions number that you see.

Doug Rex - What is that adoption rate?

Chris Primus - The results from a recent CEO forecast looked at three different scenarios. One of the scenarios was a kind of a trend scenario. As I recall the number for EVs was about 9.2% in 2030. Then we assumed a slightly higher rate than one of the scenarios, which was known as the CD plus scenario, which factors in another 2%.

Doug Rex - Thank you. I wanted to understand what the takeaways from this table, especially on the revenue side. Does the table represent the sensitivity in the modeling between the two options?

Chris Primus - There is no sensitivity between the different fee factors; they are run independently and one does not influence the other.

Travis Madsen - Based on the modeling could you say that one fee has X amount of effect in getting one incentive over another?

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Chris Primus - We did not find any information regarding this at this point.

Travis Madsen - Does that mean you are assuming no impact on the fleet of EVs for share rides?

Chris Primus - Yes, we are assuming this does to change the assumptions, but this changes the amount of revenue estimates.

Travis Madsen - Can you go over the scenarios for the high and low fee and how will this change the composition of the fee?

Chris Primus - No information was obtained about how this would impact people's behaviors.

Sophie Shulman - That is one of the things that we would like to get better data on.

Chris Primus - Looking at the next provider, we used TNC single rides to set the terms and the fees that generate fees for TNCs single rides. We used these numbers and applied the fees for TNC pooled rides. This generated a certain number of fees within the peer to peer car share. From our information, there is not a lot of evidence of fees that occur today or in the future. As a result, when we use those fees that we generated, reduce for the TNC single rides, the revenue that results is relatively minimal on an annual basis. Similarly, for the non peer- to-peer car share category. We did have a pretty good amount of information about taxis and how many occurred a day. For car rentals, we estimate a higher amount of revenue compared to the other categories that we looked at. The mileage-based fees generates the lowest and the flat fees are highest. Residential delivery is a little difficult to assess, since we have very little data available. Since we don't know the costs of the trips today, we can not really estimate the cost of the trips or the fees for the future.

Greg Fulton - Can you identify the administrative cost that is impacted from getting these fees?

Jonathan Bartsch - We did engage the fees committee on the steps that would be in place from the fees. Checking in with people on the phone regarding questions to the modeling presentation.

No comments were made from the people on the phone

Chris Primus - The actual percent of EVs from the Colorado Office of Energy report shows that currently there are 0.8% of EVs in the overall fleet. By 2030, that number is assumed to be 11.9%.

Johanna Jamison - In the modeling webinar there was a line at the bottom of the table that identified the percentages by which the cost will increase. I found it helpful that the line contained the percentage that a cost would be increased. Can this be added back?

Chris Primus - We simplified the table, but we can add that information again.

Will Toor - In the case of TNCs and the revenue generation, is this the same under the three scenarios? For all of the low about 0.8% and the high about 2.4%, since these are normalized?

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Chris Primus - Yes.

Alejandro Henao - Assuming in the future, that the average ride will be at 11 miles, or is the TNC going to keep the cost per passenger the same for the year 2030? If the cost per ride increases between now and 2030, then the cost of transactions would increase. Or if people take longer trips in the future.

Chris Primus - That is correct. We do not make those assumptions within this report.

Travis Madsen - You add that there is no increase in the inflation rate from now until 2030?

Lou Davenport - Should there be an account for inflation?

Chris Primus - This is all in 2019 dollars.

Jonathan Bartsch - Anything else here for Chris? This was a quick time frame and a shortage of information. Acknowledging the work that Chris put into this.

## **5 - Sub-Committee Compiled Final Recommendations**

Jonathan Bartsch - Moving into the next part, we are talking about the final recommendations of the six sub committees. One of the things that we heard at the last stakeholder meeting, was how does this all come together? We want to do an exercise today which allows us to prioritize all of the recommendations that were made within the stakeholder working groups. We will hear the report out on the recommendations, followed by a priorities assessment. We will be able to look at all the recommendations, prioritize these, and then discuss this afterwards.

### **Incentivizing Zero-Emission Vehicles**

Mike King - The purpose of this subcommittee was: To explore policies and incentives that could help motivate the replacement of internal combustion engine vehicles (ICEVs) with zero emission vehicles (ZEVs) in the emerging mobility sector.

The top recommendation here is the idea that any proposed fee structure for commercial vehicles should be waived for trips completed in a ZEV. Two sub recommendations involving this was that we should consider an appropriate cap and then reevaluate this to make sure it is accomplishing the goals we want to accomplish. Secondly, we stated that the Transportation Providers should provide clear cost estimates that show customers the price difference between a trip in a ZEV versus in an ICEV. There are existing programs like this, but just a general statement that there should be transparency.

Another topic of discussion was: How can fees be utilized to support infrastructure for electrification and incentives Transportation Providers to convert from ICE vehicles to ZEVs? There were questions regarding supply constraints for normal and future information demands of a growing population. Discussion on the market supports that would need to be included. Rated the idea of free or discounted charging stations. We were asked to look at policies that would incentivize electrification of transit and group ridership.



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Another idea that was mentioned was helping first responders understand how to manage EV crashes. Additionally, we think that automated vehicles will likely be electric vehicles.

Lastly, we identified some barriers and challenges that include: high capital cost of EV, limited EV models, and vehicles range. We also identified some need for more research for how hybrid electric vehicles would be treated under a fee structure. The second question is about the special considerations for residential delivery vehicles, in addition to the unique barriers for the ZEVs adoption.

Greg Fulton - One thing we mentioned was that from a delivery standpoint, we want to have the charging infrastructure on the property. Also some other areas that we located out in rural areas, is the electric grid being enhanced enough to support the electrification of these vehicles?

Jonathan Bartsch - Any other comments from the subcommittee?

No other comments were made.

### **Natural Environment Impact and Emissions Analysis**

Travis Madsen - The purpose of this subcommittee was: To identify the current and future emissions impacts of the emerging mobility sector, and to discuss principles and policies that promote the state's emission goals while mitigating negative impacts.

We looked at the state's most recent emissions inventory. The transportation sector has the largest source of climate changing pollution in the state. HB 19-261 contains targets of reducing the pollution within the transportation sector. We found that new mobility services could make pollution worse or better, depending on how the services develop over time. In general, the best outcome results are when the vehicles are zero emissions and when the rides are shared rides. A study from the University of California Davis showed that if cars were shared, electric, and autonomous, it would cut down emissions by 80%. That would be good for the government because the more you go electric and have shared ridership, the cheaper the cost of maintaining the transportation system would be.

We included several recommendations seen on the slide, and also included some complementary policies outside of the scope of the policy. Our recommendation includes expanding on electrification and working to achieve higher amounts of sharing rides. This is generally what we talked about. We mostly wanted to know how our recommendations conflict with any of the subcommittee's recommendations and if anything was missed.

Jonathan Bartsch - Anything on the subcommittee that was missed?

No comments were made.

### **Congestion Management: Incentivize Shared Ridership and New Mobility**

Doug Rex - Thanks to Lisa and Lily for the help within this subcommittee. The purpose of the subcommittee was to: Incentivize multiple passenger ride sharing for motor vehicles used for

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commercial purposes, and the use of such vehicles as a first and a last mile solution for public transit users.

In regards to our recommendation, number one and eight are related. Recommendation number one is to: Develop a user fee structure to TNCs which has a graduated fee to be higher for non-shared rides and to be a reduced fee for shared rides. Recommendation number eight is: A dynamic fee structure by the time of day pricing was brought up as a tactic to relieve congestion. Higher fees during rush hours would discourage travel. This strategy could be considered to decrease congestion and emissions.

We believe in a graduated fee future to create more shared rides. Number eight has to do with the dynamic fee structure related to the time of day.

David Spector - Is this suggestion for the time of day pricing related to when we feel that congestion is happening the most? In terms of demand and the variability, does it depend on the typical time where there is the most congestion or is this based on other factors that would cause congestion and emissions such as larger scale events?

Doug Rex - I think this is related to events and the fee structure would be more dynamic. We also talked about mobility hubs. We will need to define this, what they mean, and how these respond to the first and last mile idea to be integrated into the transportation system. We could also provide an incentive for commuter carpools that would happen going to and from these mobility hubs. There are recommendations related to employer commuter program, which would be education provided to employers stating that there are carpools available for their employees.

The fourth recommendation is to explore the mandatory employer based TDM programs for employers over 100 staff members. We also talked about a tiered approach for employers in urban vs. rural areas because rural business may have less than 100 employees.

Five, six and seven are related to carpool and vanpool recommendations, even though these are not specially related to the task of the legislature. Even though we were not asked to come up with recommendations for how the money will be spent, we did come up with fifteen different options for where the revenue would go for the fee structure. You can see this on the PowerPoint slides. Any questions? Thank you.

Jon - Thank you. Let's keep going with the next presentation.

### **Social Impact and Equity Analysis**

Jonathan Bartsch - Kate Williams is not able to inform us today since she is not here, so Lisa will be giving the presentation.

Lisa Streisfeld - Aaron Willis was unable to attend as well. The purpose of this subcommittee is that: The Subcommittee was tasked with developing a series of recommendations for the Working Group on how to develop regulations and fees that would be most equitable, and reduce the impact on low income, underserved, and disadvantaged populations.

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We wanted to make sure that our recommendations were not hampering any development of improving mobility within rural places. Second is that the fee should be reduced or eliminated when transit is not available during some hours of the day, such as when people are coming home from the third shift. The third thing that came up is to look at the equity of the fee on the vehicle operators, passengers, and the E-Commerce Package receivers.

Recommendation number one is to limit the fees impact of development of innovative (transportation) solutions for rural areas. Recommendation number two was that the fee should be eliminated or reduced when mobility options are limited. Recommendation number three was that the fee should consider the equity of the fee on companies, or underserved populations. Recommendation number four focused on eliminating or minimizing the fee in trips originating from low-income communities according to the HUD definitions. The fifth focused on eliminating or minimizing fees for commercial deliveries of groceries or essential goods to neighborhoods that are in “food deserts.” The six fee focused on incentivizing more affordable and accessible mobility options to help discourage zero and single-occupancy trips. Recommendation number seven focused on incentivizing the first and last mile rides. Recommendation number eight is that the fee would be applied to all Colorado municipalities.

Greg Fulton - One thing, we mentioned is that we end up having packages from Amazon, groceries, and medical packages mixed with everything else. The company at the delivery suite does not know what is inside. This creates a challenge. How do we identify a low income area? I think this is an element that is very difficult. Residential delivery has been a boon for those disabled folks out there.

### Safety

Lou Davenport - The purpose of the safety subcommittee was to: Identify and evaluate the potential impacts to safety brought forth by emerging transportation technologies and business models.

First slide includes a recap of the considerations and questions to keep in mind. For the question “How has emerging technology positively and negatively impacted the public safety,” we wanted to consider both the positive and negative impact, since these fees change cause both a positive and negative impact. The big question that our group comes back to is: What data do we need to adequately assess the impact of emerging transportation technologies in regards to public safety? We divided our recommendations within three different groupings, including data, policy, and education.

One thing to highlight is the crash data for EVs by first responders, since this only gets updated every few years. We also need to pull critical data on safety. For policy, the highlights included reviewing hours of operations, not necessarily for one mode but across the board what the reasons were that these hours of operation are in place and if this is even impacting safety.

Evaluating hotspots came up heavily. Right now the hot spots are for TNCs and delivery vehicles having curbspace to safely deliver packages. Are there natural reactions to this? We want to look at this in more detail to come up with standards to what other DOTs and cities are coming up with. Would Colorado be good for a test bed for encouraging the industry to test new things?

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We also looked at education, and focused on educating Colorado drivers about advanced driver assistance systems. This is all focused on an individual driving a car. This is focused on the safety and emerging tech that different companies would need to focus on. Right now it is EVs but what will the next emerging mobility that will impact first responders? Many of these recommendations will take many years before getting implemented.

David Spector - Each subcommittee has done a great job making the recommendations. Has someone gone through to say that some of the recommendations are either consistent or not consistent with each other? How will these be dealt with within the draft report?

Jonathan Bartsch - This will lead into the activity that we will do today. You will pick the top six recommendations for either yourself or your company. We can then look for short, mid term, and long term impacts.

### Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies

Nick Farber - The fees structure subcommittee could not reach a consensus on the fee structure. However, we are recommending one or a combination of the three fee structures sites, included are mileage based, flat, and percentage based fee. The percentage based fee is very challenging to administer while the mileage-based fee requires data collection and concerns about privacy. This does address the goals within the legislation. The percentage based fees is representative of the length of the trip, but hard to deliver for residential delivery and does not represent the goal of the administration. I would like to hear from the members and the diverse options of the subcommittees.

Alejandro Henao - One big thing mentioned earlier is that the percentage based fee takes into account inflation, where others might not.

Representative Chris Hansen- Any of the recommendations that we will implement will also account for inflation.

Travis Madsen - California's baseline emissions analysis might be an interesting thing for us to look into.

Greg Fulton - We (Freight Advisory Council) are the only ones here that are not local or regional. We have a lot of fees within the freight system that are embedded into the delivery fees and there are thousands of businesses that you would have to reach out to regarding this fee. I think the challenge is implementing this fee on the package delivery companies.

### Break

Jonathan Bartsch - We will take a working break. Everyone should have a copy of a document titled "Fee Structure and Use of Fee Recommendations" and "Policy Recommendations." During the break, we are going to have you prioritize these questions. We will give you a 15 to 20 minute break to review these and talk to your stakeholder working group members about these. Then, we want you to choose the top six priorities. What are the things that have the highest impact or are the easiest to implement? There are 44 recommendations and we will have a conversation about why these are the most important. You can use your smartphone or a computer to participate within these polls. For those on the phone, we

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are going to ask you to engage within this as well. When we come back from the break we will have you do a poll and this will be associated with the different recommendations.

### 6 - Exercise

#### Prioritizing Recommendations from the Sub-committees to Integrate to Chapter 7 of Report

Jonathan Bartsch - People are starting to respond to the poll that is available online. It is easier to respond via a computer but you can also respond on a cell phone.

Attendees were given 10 minutes to prioritize the top six priorities for both the policy approach and the fee structure that would be implemented. Participants were given 10 minutes and six votes.

#### (First informal poll) Determine Top Priorities - Policy Recommendations

Jonathan Bartsch - The top priorities that were voted on were:

- A - Incentivizes first/last mile rides by providing a reduced or waived fee structure for rides originating or ending at Mobility Hubs in Colorado.
- F - Incentivizes more affordable and accessible mobility options that help discourage zero and single occupancy trips.
- S - Promote fleet electrification, and vehicle pooling and sharing.

Jonathan Bartsch - If you added these as your priorities, give us some feedback. What was informing this decision?

Daniel Hutton - A and F were both up there because they involve incentives, such as carrots, and also sticks. It has been harder to get the incentives, because we have less and less access to these, so we would like to see more of these.

Jeff Cleland - I also like the incentives of fleet vehicles. Could help support the electrification of fleet vehicles.

Travis Madsen - I also think that Recommendation S is the top thing we need to do, which is electrify vehicles. The more that we can do with delivery vehicles and the more we can do with the TNCs being shared, this has the least impact on the fee structure. What size should the fee differential be? I think that the state might have to experiment with that to charge the fee to see what happens.

Elise Jones - I would also add a first and final mile. We have over a \$5 billion dollar investment into public transit. If we do this right and create incentives, then this is good for the transit system and the new mobility options. Not putting these two against each other but having them work together.

Jake Swanton - We are viewing our service as a complement to transit. We are seeing this happen within the shared rides and those that would make the connection between shared rides. Making fees zero or low for EVs and first and last mile would be ideal.

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Representative Chris Hansen - The point that there are many mobility options that don't exist this year but will exist in the future. It is not just taking regular EV and turning them into fleet vehicles. There are also the options of unique vehicles for fleets. This is similar to the Black Cabs in London, where there are higher upfront costs but lower per mile cost. As we think about fee structure, we need to remember that what is on the customer market might be different for the fleet vehicles.

Johanna Jamison - A lot of first and last mile trips are shorter trips, which would be harder for the flat fee approach.

Jake Swanton - One thing I would say to that is as we are seeing people of lower income move farther outside the city, so this is a double-edged sword with how we deal with fee structures.

Greg Fulton - One of the things that happens is that a number of our companies are investing into these natural gas vehicles, which has a longer life span. I will say that another challenge that happened on this investment, is the ROI on these and secondary markets that happen. These are looking at the secondary market and how that sells into that. We are looking at a situation of our fleet turning into alternative options.

Jonathan Bartsch - Another one that got a lot of votes was R, which was: Encourage the growth of new mobility business models that will contribute to a more stable climate, cleaner air, and healthier people.

Travis Madsen - This was a principle that is so big and overarching that it might be hard to implement. I didn't pick this one because it was a principle.

### **(Second informal poll) Determine Top Priorities - Fee Structure and Use of Fee Recommendations**

Travis Madsen- I think it would be useful to switch it from A-F, and the other ones on about the fee and the structure.

Jonathan Bartsch - Recommendation G got the most responses, which was: Invest in ways to help mobility companies replace less-efficient private vehicle trips and reduce system-wide pollution. Does anyone want to weigh in on this?

Travis Madsen- I put that one up there because in the emissions committee it became clear we were interested in energy efficiency not just to focus on the EVs. If we are pushing the transportation sector into this section, we could get more congestion savings.

David Spector - Funding new infrastructure programs, it is easy to think about what you would spend your money on tomorrow. I like that one because it implies that we may not know what we want to spend our money on because these programs or products might not exist yet. Dedicating the funds that gets locked into for a period of time might not be the best use for how we spend the money.

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Will Toor - As I look at E-G, I would hope that the legislation would not be so specific about the investment of ZEV infrastructure and program. I hope that there would be some general ability and criteria that would allow these to be flexible.

Jonathan Bartsch- I think that this is in terms of the legislature being flexible.

Will Toor - I would recommend putting investments in a range of programs, rather than specifying and giving the legislature the flexibility to address fees over time.

Greg Fulton - If we would have been sitting here and start talking about infrastructure in terms of charging, 6-7 years ago we would have been looking into different avenues. I think it needs to be a little more defined than just general. We caution that we are not focused on the specific.

Jonathan Bartsch - It is a recommendation around zero emission infrastructure and their range of elements, should technologies change.

Travis Madsen - When Greg mentioned earlier on delivery vehicles being more efficient than personal vehicles, that is interesting. It is possible that using this to expand on the public deliveries could have a good impact.

Jonathan Bartsch - Any of the A-G low hanging fruit and not being too specific? Others that are more of a short term implementation than others?

No comments were made.

Jonathan Bartsch- Let's take a look at H-Q. The top priorities there were:

- Recommendation I - Have the lowest or waived fees for trips in pooled/shared rides.
- Recommendation J - Has the lowest or waived fees for trips in combination of ZEVs and shared rides.
- Recommendation K - Has reduced or waived fees for trips which start or end in mobility hubs.
- Recommendation L - Varies by time of day to address congestion.

Jonathan Bartsch - Folks want to weigh in on what you're thinking about that?

Representative Chris Hansen - The first one I circled was L. This is very exciting because we will have tools that we have never had before because of the technology. I think that is exciting and allows us to fine tune this over time. We need a flexible structure to allow us to look at these fees in an open way. We are not going to get it right out of the gate. Lots of great things about this list, but there is also an elephant in the room because we also need to pay for the road maintenance and construction. So I hope the room is not totally focused on A-G recommendation because there are other things that we still need to figure out, such as other funding mechanisms. Just to reiterate something I said, I think in the first meeting, which is I see this effort in the context of a larger transportation funding discussion, that this doesn't sit in isolation. That is instead of a piece of that larger puzzle.



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Commissioner Chaz Tedesco - When we are incentivizing EVs and doing all these discounts, I think we have all of the best intentions in the world, but at the end of the day we have infrastructure that we want to maintain and are looking at the infrastructure for the future.

Elise Jones - One of the benefits of this whole conversation is that we need to come up with a new way of funding the transportation system. If we start with TNCs, this would be the logical explanation for creating a VMT based fee for everyone. I also wanted to flag since we're on this, that there's going to need to be a conversation at the state legislature about sharing back to local governments. If you want to get complete buy-in from local governments, you're going to have to give them some money to address the impacts on them, particularly in larger cities and urbanized areas. Or allow cities and counties to charge our own fees within our cities and counties to account for safety and road impacts

Greg Fulton - The caution that I have in some cases that I think a lot of ways after the FASTER bill was passed, is that it was not enough to get what needed to be done out there. I would be cautious of how far you need to take this. We need more funding for the transportation system. I don't know how far away we are from this, but one of the outcomes could be a reduction in the transportation infrastructure. We can move in a direction where there's fewer vehicles, and there's more people in them and we need less lane miles to get the same amount of work that we did end up needing less money and have an excellent transportation system.

Travis Madsen - If we can move in the direction of fewer vehicles and we need less lane miles, we would end up needing less money to have an effective transportation system. Freeing up money and land, that is the opportunity here. Think less about transportation.

Will Toor - I would be cautious of thinking of this exercise about coming up with a meaningful amount of money to come up with the whole system and looking at this as a small piece of the pie, and getting into policies that would incentive shared trips. Part of the idea was going to the future that Travis is speaking to. In many ways I viewed this experience as training wheels. When looking at autonomous vehicles, this could possibly lead to an enormous increase in VMT if we do not have the proper fee in place. If we don't, then we might be talking about this one impacting a few amount of trips. If we move to a wide autonomous vehicle sector, this is the model that we could use. How we fund the transportation system is an important but separate issue.

Representative Chris Hansen - This is the first step work we are trying to do here. I am a big proponent of not trying to fight the last war. I think we can all agree that we have a segment of the market that will grow rapidly. To disconnect this from the transportation system is a mistake. We need to create something that can flex and can grow as this shared market grows, and then I think we have a chance for sustainability. We don't want to have to find ourselves in the position that we are in with the gas tax.

### **Which priorities are Near-term, Mid-term and Long-Term? Exercise to integrate into SWG recommendations and report**

Jonathan Bartsch - How about in terms of implementation steps. What do you think in terms of near, mid and long term implementations? Given three priorities, what would be the most important thing?

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Greg Fulton - Let's say you're going to do this via the internet. Take the sales tax ideas, where you let the businesses keep a small percentage of this tax for the cost of implementation. Second and dividend, the implementation is if you're going to do something like that, at least from our end is that there are thousands and thousands of other groups and businesses out there in the delivery world. We're talking about implementation challenges such as modifying software, and then also the audit. Just putting it in perspective that with updating the sales tax within the state of Colorado, it takes anywhere from 18 months to two years to get the business to modify a change like that. If we take this to a national and international level, that could take even longer. Would there be some funding pushed back to the people that are transporting this?

Johanna Jamison - I think some of these items are not recommendations but principles. From my perspective there would underlie any action would be G, M, N and the equity piece from multiple lenses.

Alejandro Henao - I have been involved in some conversations in California, because they are doing a similar exercise. Something that comes to mind from the research perspective is to make it easier for private and public to monitor and check these things. Their TNC policy would be to assume that all of the rides pay the full fee on the front end. After that point, the companies provide additional information about certain EV vehicles or pooled and shared rides. This creates a system that would incentivize the company to report these things so that the company could get a discount or incentive. This could work where in the first month they pay the full fee amount and then the following month their data reporting determines how much of a discount or rebate they receive..

## **7 - Public Comments**

Jonathan Bartsch - Public comment section. Is there anyone who would like to make a public comment?

No public comments were made.

## **8 - Conclusion**

### **Comments from Stakeholder Working Group Due November 1, 2019**

Jonathan Bartsch - You will need to send in all of your comments by the first of November, this is all located within the Google Folder. The document will be sent out to everyone tomorrow. Please put in your final comments, observations about the substance, recommend of the process, and what comes in the future.

### **Final Comments from the Stakeholder Working Group**

Jonathan Bartsch - We will give everyone a moment to say a final thought before we end the meeting.

Doug Rex - Thank you. I am interested to see the final report. It has been an interesting conversation, I wish we had more time. My thoughts are in regards to the fee options, I don't feel that I have a lot of clarity within this.

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Travis Madsen - My main takeaway here is that I am excited and also daunted by the challenge of decarbonizing the transportation system. If we are going to hit the goals outlined in the house bill, then new mobility services have to be a part of that solution. I think that it makes sense for us to steer that growth in a way that is beneficial for everyone within the state.

David Spector - It has been great to get all of the right stakeholders together in the room. Not an absence of someone who should have been here. While I understand the legislature wanted to move forward quickly, I would have liked more time to spend on the modeling.

Jake Swanson - I wanted to thank the CDOT staff and the working group members. From Lyft's perspective, thank you for resisting the temptation of finding a new piggy bank for filling the hole in our transportation funding.

Manolo Morales - As you saw from the modeling, we are small and hoping to grow. Don't forget the unique attributes of the peer to peer car sharing model.

Celeste Stagand - Thank you to everyone, this has been a large effort. Nice to see the public and private sector get together to solve problems.

Johanna Jamison - Appreciate the opportunity to be involved.

Jeff Cleland - Echo the comment in favor of public and private partnerships.

Elise Jones - I want to say thank you for the opportunity and the heavy lifting that people did here. This is important work and a piece of the bigger puzzle. I agree that this is not the way to fund the transportation system. I encourage the legislature to set this up in a way that we are learning and adapting, and it is nimble and not inked into law. If we do this right, we will be trying things out.

Commissioner Chaz Tedesco - I enjoyed my time on this work and talking to everyone, I wish I could believe that this will lead to reduced VMT. In my lifetime I have never seen traffic diminish or decrease. From Adams County, we have the least amount of multimodal options out there. We want to incentivize EVs, but we are creating ease of access at a lower rate, which will increase VMT. EVs have the same impact on infrastructure and congestion. EVs have the same, if not more impact, on our roads. We need to be prepared for the future.

Nick Farber - Thank you to everyone and the HDR team for working with this project. I participated and helped where I could, and it was Lisa and Lily doing a lot of work. I am excited to see what comes out of this. We appreciate everyone's responses. I am looking forward to the final product. Also, thanks to Jonathan for mediating this.

Greg Fulton - Thank you for everyone on the behalf of the Freight Advisory Council, trucking, rail, and air. I also wanted to mention that we really looked at this by representing residential delivery. We have been going on for over 100 years, from the start of Sears and milk delivery. There is not a whole lot of data within the residential delivery sector. I think we tend to look at two or three, but there are hundreds of delivery companies on the delivery side, and you realize how big it is. This is an area where

# **Stakeholder Working Group for 2019 Emerging Mobility Impact Study – Meeting Notes**

## **Meeting #4 October 24, 2019**

**CDOT HQ, 2829 W. Howard Place, Denver, CO 80204, Auditorium**

we need to spend more time to get more information and analysis. I would mention that there is a trade off here too. In many cases, we are reducing emissions, VMT, and in reducing GHG through some of these ends.

Daniel Hutton - We talk about a connected, autonomous, and electric future, but we have not figured out how to increase the human side of this which is shared trips.

Sophie Shulman - Thank you to all of the CDOT and CEO staff and the consultant team. Thank you to everyone at the table for putting in all this time. The feedback is valuable.

## **9 - Acknowledgements - Director Lew and Director Toor**

Shoshana Lew - I would like to thank Sophie for moving to get this done on time and schedule, with the aggressive timeline. Also thank you to the whole CDOT team who put in the time and effort into this process. We appreciate the people coming from out of town to do this work. The investment of being a part of this group is a meaningful process. I hope that the network that we created within this process will help the people working on the project. I think that this is the last meeting but not the last conversation for the people in this room.

Will Toor - Thank you to everyone who has been a part of the process, from the consulting team, staff, and stakeholder working group. This shows a real commitment and a real sense of the importance of this issue. We are really grappling with where is this technology as a business model is taking us. How do we maximize the public benefit that comes from these new business models? There are a lot of options on the table. I am hopeful that we are looking into the future for TNC and delivery models that we see a real move toward electrification and sharing.

Jonathan Bartsch - Thank you again to everyone for participating, and for your time and energy. Please do not forget to leave your comments on the draft report by November 1st.



# 2019 Emerging Mobility Impact Study Stakeholder Working Group Meeting # 4

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October 24th, 2019  
1:00 pm to 4:30 pm  
CDOT Auditorium  
2829 West Howard Place, Denver, CO 80204



# Agenda



ITEM	TOPIC		TIME
1	Introductions and Updates (CDR)	<ul style="list-style-type: none"> <li>Welcome and introductions</li> <li>Adoption of Meeting Notes from September 26, 2019 (See Attachment)</li> <li>Modeling Webinar Presentation and Notes</li> <li>Updated Research Paper for Gap Analysis</li> <li>New Research Paper (Incentivizing Shared Ridership)</li> </ul>	1:00 - 1:20
2	Draft Report (Lisa Streisfeld, CDOT)	<ul style="list-style-type: none"> <li>Review content of different chapters</li> <li>Request comments on matrix by November 1st, 2019</li> </ul>	1:20 – 1:35
3	Colorado Fees and Taxes on Emerging Mobility (Lisa Streisfeld, CDOT)	<ul style="list-style-type: none"> <li>Matrix with an inventory of federal, state, and local examples of fees and taxes on emerging mobility.</li> </ul>	1:35 – 1:45
4	Highlights of Modeling Webinar (Chris Primus, HDR)	<ul style="list-style-type: none"> <li>Modeling approach for VMT, Emissions, Elasticities</li> <li>2030 Forecast for VMT, Emissions, and Revenue Generation               <ul style="list-style-type: none"> <li>Flat Fee</li> <li>Percent of Transaction Fee</li> <li>Mileage Based Fee</li> </ul> </li> <li>Updated Approach after Receiving Feedback from Fee Sub-Committee and Modeling Webinar</li> </ul>	1:45 – 2:15
5	Sub-Committees Compiled Final Recommendations (CDOT)	<ol style="list-style-type: none"> <li>Sustainability: Incentivizing Vehicle Electrification and the Adoption of Other ZEVs</li> <li>Natural Environment Impact and Emissions Analysis</li> <li>Congestion Management: Incentivizing Shared Ridership and New Mobility</li> <li>Social Impact and Equity Analysis</li> <li>Safety</li> <li>Fee Structure for Commercial Transportation Vehicles and Transportation Network Companies</li> </ol>	2:15 – 2:55





# Agenda



ITEM	TOPIC		TIME
	Break		2:55 - 3:05
6	Exercise (Jonathan Bartsch, CDR)	<ul style="list-style-type: none"><li>• Prioritizing Recommendations from the Sub-committees to Integrate to Chapter 7 of Report</li><li>• Determine Top Priorities</li><li>• Which priorities are Near-term, Mid-term and Long-Term. Exercise to integrate the SWG recommendations into the report.</li></ul>	3:05 – 3:50
7	Public Comment		3:50 – 4:05
8	Conclusion (Jonathan Bartsch, CDR)	<ul style="list-style-type: none"><li>• Comments from Stakeholder Working Group Due November 1, 2019</li><li>• Location of File on Google Drive</li></ul>	4:05 – 4:15
9	Acknowledgments (Director Lew and Director Toor)	<ul style="list-style-type: none"><li>• Next Steps for CDOT</li></ul>	4:15 – 4:30

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## Adoption of Meeting Notes from Second Stakeholder Working Group #3 Meeting on September 26, 2019



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## Modeling Webinar and Presentation

<https://drive.google.com/open?id=1CrSXXlCildRBsEC3lUngj-FsAsTyp2zC>



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## Updated Gaps Analysis Research Paper

<https://drive.google.com/open?id=1av3q97Ap7nN7wpBJDWcjrujPUJG21U9g>



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## Incentivizing Shared Ridership Research Paper

<https://drive.google.com/open?id=1av3q97Ap7nN7wpBJDWcjrujPUJG21U9g>



# Review Draft Report Outline

EXECUTIVE SUMMARY .....	
CHAPTER 1. STUDY BACKGROUND .....	
1.1 Introduction .....	
1.1.1. Growth of Emerging Transportation Commercial Providers and Limitations of Colorado Transportation Network .....	
1.1.2. Transitioning to Zero Emission Vehicles.....	
1.1.3. Planning for Emerging Technologies .....	
1.2 The Role of Senate Bill 19-239 .....	
1.2.1. Sponsors.....	
1.2.2. Intent & Purpose.....	
1.2.3. Roles & Responsibilities .....	
1.2.4. Working Group Membership.....	
1.3 Summary of Study Tasks.....	
CHAPTER 2. EMERGING BUSINESS MODELS & PROVIDERS .....	
2.1 Commercial Transportation Providers.....	
2.2 Current Regulatory Environment.....	
2.2.1. Commercial Motor Vehicles .....	
2.2.2. Health Certificate for Drivers.....	
2.3 Current Fee Structures in Place .....	
2.4 Impact of Emerging Providers on the Way Coloradans Travel .....	
2.4.1. Economic Impacts .....	
2.4.2. Environmental Impacts .....	
2.4.3. Transportation Systems.....	
CHAPTER 3. DATA COLLECTION AND RESEARCH .....	
3.1 Literature Review .....	
3.2 Additional Data Collection .....	
3.3 Transportation Provider Travel Activity .....	
CHAPTER 4. TRANSPORTATION IMPACT ANALYSIS .....	
4.1 Overall Approach .....	
4.1.1. Travel Demand Modeling and Forecasting .....	
4.1.2. Emissions Modeling .....	
4.1.3. Statewide Baseline VMT and Emissions (all vehicles) .....	
4.2 Transportation Network Company Modeling .....	
4.2.1. TNC Data Sources.....	
4.2.2. TNC Baseline 2018 and 2030 Trips, VMT, and Emissions.....	
4.3 Car Share .....	
4.3.1. Car Share Data Sources .....	
4.3.2. Peer Car Share .....	
4.3.3. Non-Peer Car Share .....	
4.4 Taxi .....	
4.4.1. Taxi Data Sources.....	
4.4.2. Taxi Baseline 2018 and 2030 Trips, VMT, and Emissions .....	
4.5 Car Rental .....	
4.5.1. Car Rental Data Sources .....	
4.5.2. Car Rental Baseline 2018 and 2030 Trips, VMT, and Emissions.....	
4.6 Residential Delivery .....	
4.6.1. Residential Delivery Data Sources .....	
4.6.2. Residential Delivery Baseline 2018 and 2030 Trips, VMT, and Emissions .....	
4.7 Summary .....	

CHAPTER 5. ANALYSIS OF FEE STRUCTURES.....	
5.1 Fee Structures .....	
5.2 Analysis Approach .....	
5.3 Elasticity Literature Synthesis.....	
5.3.1. Research Summary .....	
5.4 Results .....	
5.4.1. TNC Fee Structures and Revenue Estimation.....	
5.4.2. Peer-to-Peer Car Share Fee Structures and Revenue Estimation .....	
5.4.3. Non Peer Car Share Fee Structures and Revenue Estimation .....	
5.4.4. Taxi Fee Structures and Revenue Estimation .....	
5.4.5. Car Rental Fee Structures and Revenue Estimation.....	
5.4.6. Residential Delivery Fee Structures and Revenue Estimation .....	
5.5 Summary .....	
CHAPTER 6. FINDINGS OF THE SUBCOMMITTEES.....	
6.1 Sustainability: Incentivizing Zero-Emission Vehicles Subcommittee .....	
6.2 Natural Environment Impact and Emissions Analysis Subcommittee .....	
6.3 Congestion Management and Shared Ridership Subcommittee.....	
6.4 Social Impact and Equity Analysis Subcommittee .....	
6.5 Safety Subcommittee .....	
6.6 Fee Structure for Emerging Mobility Providers Subcommittee .....	
CHAPTER 7. RECOMMENDATIONS AND NEXT STEPS .....	
7.1 Information and Recommendations from Freight Advisory Council.....	
7.2 Recommendations from the Working Group.....	
7.2.1. Policy Recommendations .....	
7.2.2. Phased implementation .....	
7.2.3. Items for Additional Research .....	
7.3 Next Steps for CDOT .....	
Appendix A. SB 19-239 Legislation	
Appendix B. Working Group	
Appendix C. Chapter 2 Supporting Documentation	
Appendix D. Research Documentation	
Appendix E. Research Paper: Transportation Provider Service Coverage in Disadvantaged Areas in Colorado	
Appendix F. Research Paper: Barriers to Trip Sharing In Emerging Mobility Technologies	
Appendix G. Chapter 4 Supporting Documentation	
Appendix H. Chapter 5 Supporting Documentation	
Appendix I. Reports of the Subcommittees	
Appendix J. Colorado Freight Advisory Council Letter	

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Please review the report and submit your comments by  
Friday, November 1, 2019

<https://drive.google.com/drive/folders/1PhByDgzHWcBZ1i3HhzyFfevp97Zc9B4O?usp=sharing>





## Colorado Fees and Taxes on Emerging Mobility Providers

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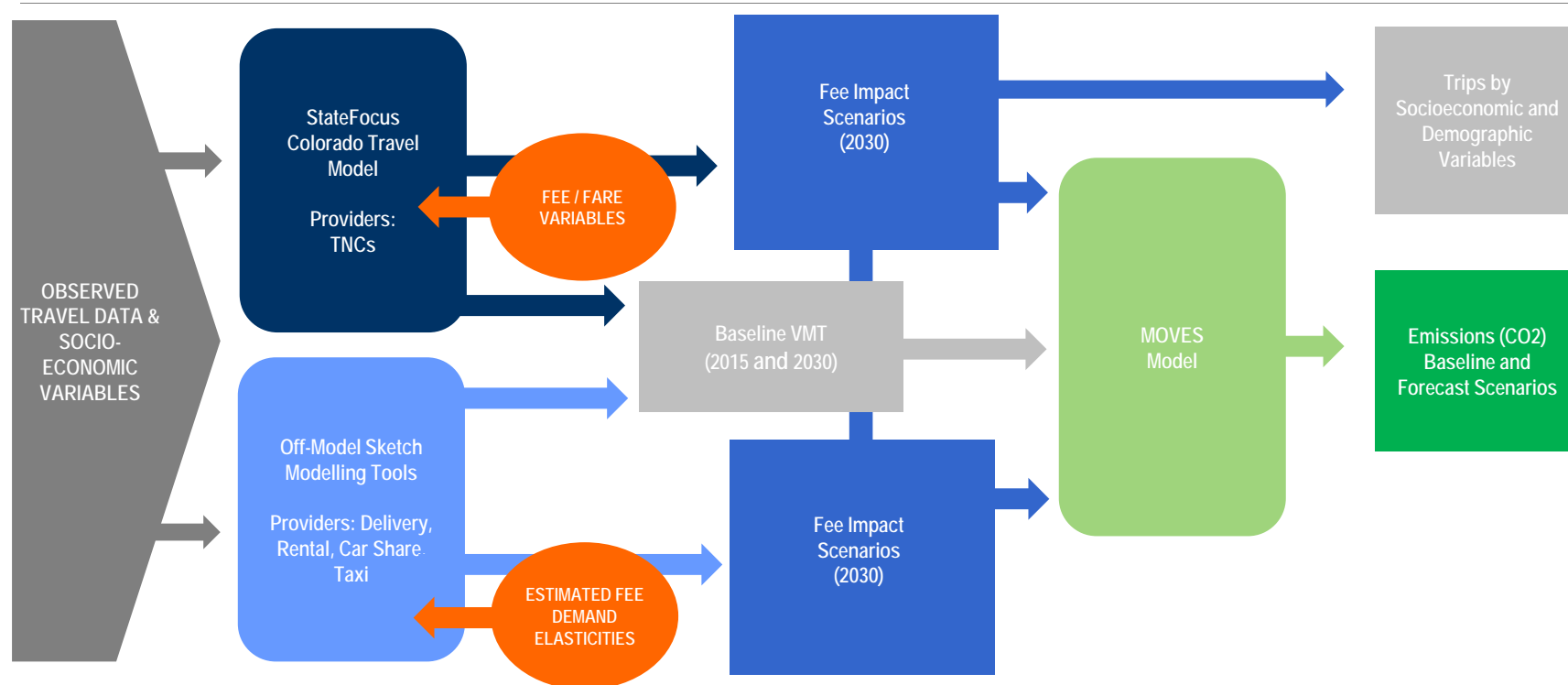
<https://drive.google.com/open?id=1smTYr13o0qJA0hExRw48zr4gMDsT-8Za>

## EMIS Modeling

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- This modeling is conducted for the purposes of being able to understand potential impacts of six emerging mobility providers on congestion and emissions in present day and horizon year 2030.
- The modeling is also conducted to be able to assess the impacts of potential fee structures on travel behavior and emissions contributed by the emerging mobility providers.
- Lastly, this model provides estimated forecasts for potential revenue generation by 3 fee structures.
- At this time, it is unknown if these specific fee structures, or variations thereof, will be implemented by the state legislature.
- The analysis is provided for research and estimation purposes for the Working Group, CDOT and CEO.

## EMIS Modeling Approach



## Fee Structure Analysis

- Mileage Based
- Flat
- Percentage of Transaction
- Range of Rates

Ride Type	Mileage-Based Fee Low	Mileage-Based Fee High	Flat Low	Flat High	% of Transaction Low	% of Transaction High
ICE, Single Occupancy	\$0.009	\$0.027	\$0.106	\$0.324	0.8%	2.4%
Shared Ride or ZEV	\$0.005	\$0.018	\$0.053	\$0.181	0.3%	1.0%
Shared Ride and ZEV	\$0.000	\$0.009	\$0.000	\$0.013	0.0%	0.5%

## TNC – Single Rides in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	273,185	267,056	273,185	266,973	273,177	267,029
VMT (Daily)	3,198,006	3,126,260	3,198,009	3,125,289	3,197,921	3,125,945
Percentage Change from 2030 Baseline	-0.22%	-2.46%	-0.22%	-2.49%	-0.22%	-2.47%
CO2e Daily Emissions (tons)	874	854	874	853	874	853
Annual Revenue for 2030 (2019\$, undiscounted)	\$9,986,705	\$29,660,506	\$9,982,309	\$30,009,188	\$10,105,739	\$29,756,155

Low-End Impact comprises the Low Fees & Less Responsive Demand  
 High-End Impact comprises the High Fees & More Responsive Demand

## TNC – Pooled Rides in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	40,844	39,971	40,850	40,144	40,878	40,486
VMT (Daily)	478,136	467,919	478,210	469,946	478,537	473,944
Percentage Change from 2030 Baseline	-0.16%	-2.30%	-0.15%	-1.87%	-0.08%	-1.04%
CO2e Daily Emissions (tons)	131	128	131	128	131	129
Annual Revenue for 2030 (2019\$, undiscounted)	\$775,580	\$2,901,718	\$702,401	\$2,374,094	\$379,203	\$1,329,781

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand

## Peer to Peer Car Share in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	199	193	200	196	200	195
VMT (Daily)	3,589	3,481	3,593	3,521	3,592	3,511
Percentage Change from 2030 Baseline	-0.30%	-3.31%	-0.19%	-2.18%	-0.22%	-2.47%
CO2e Daily Emissions (tons)	1	1	1	1	1	1
Annual Revenue for 2030 (2019\$, undiscounted)	\$11,208	\$33,020	\$7,294	\$21,992	\$8,424	\$24,804

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand



## Non Peer-to-Peer Car Share in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	2,195	2,141	2,193	2,117	2,195	2,146
VMT (Daily)	18,356	17,909	18,338	17,704	18,359	17,946
Percentage Change from 2030 Baseline	-0.24%	-2.67%	-0.34%	-3.78%	-0.22%	-2.47%
CO2e Daily Emissions (tons)	5	5	5	5	5	5
Annual Revenue for 2030 (2019\$, undiscounted)	\$57,322	\$169,908	\$80,117	\$237,873	\$53,472	\$157,448

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand

## Taxi in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	6,891	6,804	6,890	6,782	6,885	6,730
VMT (Daily)	66,617	65,771	66,599	65,561	66,551	65,053
Percentage Change from 2030 Baseline	-0.12%	-1.39%	-0.15%	-1.71%	-0.22%	-2.47%
CO2e Daily Emissions (tons)	18	18	18	18	18	18
Annual Revenue for 2030 (2019\$, undiscounted)	\$208,034	\$624,086	\$251,753	\$762,486	\$371,324	\$1,093,356

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand

## Car Rental in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	76,187	74,021	76,362	75,974	76,229	74,514
VMT (Daily)	5,046,559	4,903,135	5,058,202	5,032,511	5,049,397	4,935,748
Percentage Change from 2030 Baseline	-0.28%	-3.11%	-0.05%	-0.56%	-0.22%	-2.47%
CO2e Daily Emissions (tons)	1,380	1,339	1,383	1,376	1,380	1,347
Annual Revenue for 2030 (2019\$, undiscounted)	\$15,759,150	\$46,514,857	\$2,790,446	\$8,543,550	\$12,603,353	\$37,110,334

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand

## Residential Delivery in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	n/a	n/a	n/a	n/a	1,403,046	1,371,467
VMT (Daily)	n/a	n/a	n/a	n/a	2,517,592	2,460,927
Percentage Change from 2030 Baseline	n/a	n/a	n/a	n/a	-0.22%	-2.47%
CO2e Daily Emissions (tons)	n/a	n/a	n/a	n/a	688	672
Annual Revenue for 2030 (2019\$, undiscounted)	n/a	n/a	n/a	n/a	n/a	n/a

Low-End Impact comprises the Low Fees & Less Responsive Demand

High-End Impact comprises the High Fees & More Responsive Demand

## All Emerging Modes in 2030

	Mileage-Based Fee		Flat Fee		Percentage-Based Fee	
	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact	Low-End Impact	High-End Impact
Trips (Daily)	1,805,688	1,796,374	1,805,866	1,798,373	1,802,611	1,762,566
VMT (Daily)	11,334,490	11,107,701	11,346,179	11,237,760	11,331,949	11,083,074
Percentage Change from 2030 Baseline	0	0	0	0	-0.22%	-2.41%
CO2e Daily Emissions (tons)	3,099	3,034	3,102	3,071	3,098	3,025
Annual Revenue for 2030 (2019\$, undiscounted)	\$26,797,999	\$79,904,095	\$13,814,320	\$41,949,183	\$23,521,515	\$69,471,877

These total values include unimpacted residential delivery numbers.

## Subcommittees Compiled Final Recommendations





## Incentivizing ZEVs: Purpose

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*To explore policies and incentives that could help motivate the replacement of internal combustion engine vehicles (ICEVs) with zero emissions vehicles (ZEVs) in the emerging mobility sector.*



## Incentivizing ZEVs Subcommittee: Recommendations

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1. Any proposed fee structure for commercial vehicles should be waived for trips completed in a ZEV.
  - ☐ Assuming this is the case, the policy should include an appropriate cap, sunset date, or periodic reassessment to address the long-term revenue impacts of commercial fleet electrification.
  - ☐ Transportation Providers should provide clear cost estimates that show the price difference between a trip in a ZEV versus and ICEV to allow users to make an informed decision.
2. How can fees collected be utilized to support infrastructure for electrification and incentivize Transportation Providers to convert from ICE vehicles to ZEVs?
  - ☐ Fund existing Alt Fuels Colorado, Charge Ahead Colorado, and other state grant programs.
  - ☐ Fund new infrastructure programs including home-charger installation and community charging hubs.
  - ☐ Fund fast-charging depots in high-traffic locations such as airports, transit hubs, and downtowns.
  - ☐ Support free or discounted fast charging for Transportation Providers.

## Incentivizing ZEVs Subcommittee: Recommendations

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3. How can these policies or incentives address supply constraints and meet current and future infrastructure demand with a growing population?
  - ☐ Supporting the greater adoption of EVs will normalize their use and incentivize OEMs and dealers to scale up production and make more vehicles available to the public
4. What types of market support will be needed for a transition to more ZEVs on the road in terms of OEMs, utilities, and users?
  - ☐ Provision of more ZEV models, features, and ranges by OEMs to dealerships in Colorado
  - ☐ Creation of more favorable EV charging rate and demand charge structures by electrical utilities
  - ☐ Free or discounted fast charging for Transportation Providers by charging station operators

## Incentivizing ZEVs Subcommittee: Recommendations

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5. What type of policy could simultaneously incentivize the electrification of transit/group ridership (shuttles, buses, vanpools, etc.) and recreational vehicles (ATV-All Terrain Vehicles, bikes, scooters)?
- ☐ Investment of fee revenues in electric transit vehicles and/or electric micro-mobility infrastructure
  - ☐ Coupling of pro-ZEV and pro-sharing fee structures to make a shared ZEV the most economical option for riders

## Incentivizing ZEVs Subcommittee: Recommendations

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6. What safety issues with vehicle electrification should be evaluated?
  - ☐ First responders and incident management personnel need ZEV-specific training.
  - ☐ There is currently a lack of EV-trained technicians to service and repair ZEVs in Colorado.
7. How does autonomous vehicles (AV) technology factor into the adoption of ZEVs?
  - ☐ It is often assumed that over the long-term autonomous vehicles at scale will be ZEVs, which will require a convergence of the two technologies and potentially a redesign of charging infrastructure.
  - ☐ Any future fee structure may need to consider the case of a zero-occupancy electric vehicle and how to balance its positive and negative implications.

## Incentivizing ZEVs Subcommittee: Barriers and Challenges

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- High Capital Cost of EVs
- Limited EV Model Availability and Vehicle Range
- Limited Access to EV Charging Stations
- High Cost of Fast Charging
- Lack of EV Education and Awareness

## Incentivizing ZEVs Subcommittee: Questions

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- What should be the place, if any, of Hybrid Electric Vehicles (HEVs) in the fee structure and in Colorado's overall support for ZEV adoption?
- What special considerations should be given to Residential Delivery companies given the additional and unique barriers to ZEV adoption, such as the relative lack of medium-duty ZEVs and need for private charging infrastructure?



**COLORADO**  
Department of Transportation



**COLORADO**  
Energy Office

## Natural Environment Subcommittee: Purpose

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*To identify the current and future emissions impacts of the emerging mobility sector, and to discuss principles and policies that promote the state's emissions goals while mitigating negative impacts.*



## Natural Environment Subcommittee: Principles

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- System-wide transportation policy should be aligned with HB19-1261.
- The state should encourage the growth of new mobility business models that will contribute to a more stable climate, cleaner air, and healthier people.
- The state should promote fleet electrification, and vehicle pooling and sharing.
- The state should develop complementary policies that address pollution from all vehicles.

## Natural Environment Subcommittee: Complementary Policies

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- State:
  - Clean Truck Rule
  - Zero emission VMT standard for fleets
  - Policies addressing other parts of the transportation system (e.g. LCFS)
- Local:
  - Partner with utilities to put charging infrastructure in strategic locations
  - Prioritize shared and electric vehicles wherever possible (egg Airport)
- Utilities:
  - Work with fleets to accelerate electrification

## Natural Environment Subcommittee: Questions

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- How do our findings and recommendations overlap (or conflict) with other subcommittees?
- Is there anything we missed?

## Natural Environment Subcommittee: Barriers and Challenges

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- The State has statewide VMT data, but it is not apportioned by the sources identified by SB 19-239. Many assumptions had to be made to determine VMT of commercial transportation providers. If the State had access to more data, better estimates of VMT and associated emission changes could be calculated.
- What policies or programs are most effective at shifting people towards shared vehicle ownership and pooled trips?



## Congestion Management: Purpose

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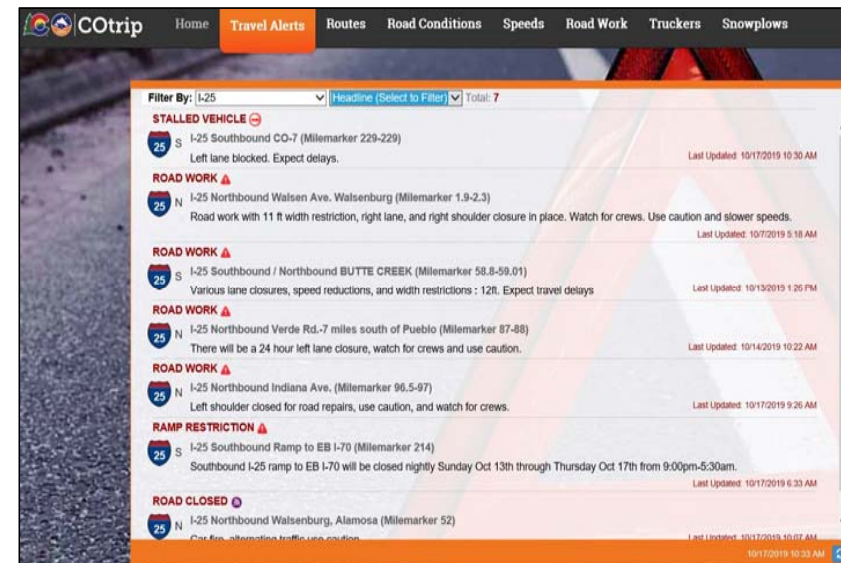
*Incentivize multiple passenger ride sharing for motor vehicles used for commercial purposes, and the use of such vehicles as a first and a last mile solution for public transit users.*





## Congestion Management: Recommendations

1. Develop a user fee structure for TNCs which has a graduated fee to be higher for non-shared rides and to be a reduced fee for shared rides.
2. Provide for a reduced fee structure for rides originating from Mobility Hubs in Colorado.
3. Expand existing voluntary employer transportation demand management (TDM) programs through partnerships with Transportation Management Associations (TMAs) and Transportation Management Organizations (TMOs).
4. Explore mandatory employer based TDM programs for employers over 100 members: Two Tier approach, for urban and rural.





## Congestion Management: Recommendations

5. Examine other incentives to promote carshare, vanpools, carpools, and other forms of shared ridership on a statewide basis.
6. Continue implementing targeted TDM strategies for construction zones and for special events.
7. Develop a statewide carpool matching website/App that builds on existing carpool matching programs within the Front Range.
8. A dynamic fee structure by time of day pricing was brought up as a tactic to relieve congestion. Higher fees during rush hours would discourage travel. This strategy could be considered to decrease congestion and emissions.

Way to Go - Commuter Services



Welcome to **VAN GO**



**Lots of ridesharers**

We'll help you find someone close by your home who shares your workplace destination and hours.



## Congestion Management: Recommendations for Revenue from a Fee Structure

1. Development of a community congestion management plans
2. Application of operational funds for transit service providers
3. Application of operational funds for shuttle service to key destinations
4. Development of parking interceptor lots to minimize congestion in downtown areas
5. Application to Transportation Demand Management Plans
6. Application for both new and existing MPOs, TMAs and TMOs
7. Construct new or enhance existing bike and pedestrian facilities
8. Enhancement of options for different types of mobility, including vanpool funding, carpool, micro transit options such as scooter-share and bike-share
9. Public-private partnerships with emerging mobility providers to provide more mobility choices in underserved communities in Colorado.
10. Application to create a multi-modal transportation network and provide people with more mobility choices.
11. Application to assist employer based TDM programs, such as an employer shuttle service or vanpool program.
12. Application to provide all access transit passes (like an EcoPass) to employees of participating companies.
13. Utilize funding to assist with a tax reduction for commuters
14. Application to construct vehicle charging infrastructure
15. Application to encourage emerging mobility providers to locate in mobility hub areas.

## Social Impact and Equity: Purpose

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*The Subcommittee was tasked with developing a series of recommendations for the Working Group on how to develop regulations and fees that would be most equitable, and reduce the impact on low income, underserved, and disadvantaged populations.*

## Social Impact and Equity: Recommendations

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1. Any recommended fee structure should consider the ability of emerging technology companies to expand and grow in Colorado. The fees implemented should not hamper the development of innovative solutions especially for rural areas.
2. The fees should be reduced or eliminated where and when mobility options are limited, such as when public transit is less available during different times of the day and different days of the week.
3. As a fee structure looks to curb vehicle miles traveled of emerging mobility commercial providers, the Stakeholder Working Group should also consider the equity of the fee structure on companies, on vulnerable and on underserved populations. These populations include the vehicle operators (the drivers), passengers (the riders) and E-commerce package recipients.

## Social Impact and Equity: Recommendations

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4. The fees should be eliminated or minimized in transportation trips originating in low-income communities according to HUD definitions.
  - ❑ The Subcommittee chose to use the HUD definition of low-income communities due to its easier administration and simplicity than other sources. HUD uses special tabulations of Census data to determine areas where at least 51% of households have incomes at or below 80% of the area median income (AMI).
5. The fee structure should be eliminated or minimized for the commercial delivery of groceries/essential goods in areas that are underserved by grocery stores or deemed “food desert” neighborhoods.
6. The fee structure should incentivize more affordable and accessible mobility options (e.g. car sharing, Uber/Lyft pools, mass transit) that help to discourage zero and single-occupant trips (e.g. personal vehicle ownership, single-rider Uber/Lyft)

## Social Impact and Equity: Recommendations

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7. The fee structure should incentivize 1st/Last Mile rides (The "last-mile" or "first and last-mile" connection describes the beginning or end of an individual trip made primarily by public transportation.)
  - ☐ The Subcommittee considers this a viable proposal to administer by designating certain areas reduced fee areas, like mobility hubs. Journeys that begin or end at a mobility hub would see the reduced fee.
8. The proposed fee would be applied to all Colorado municipalities.
  - ☐ Would reduce administrative burden.
    - If a checkerboard of opt-in and opt-out areas developed it would be unclear how a fee should be charged in proportion to where the journey originated or terminated.
  - ☐ Would reduce confusion and app development difficulties.
  - ☐ Allowing certain communities to opt-out may even encourage TNC drivers to drive further in order to operate in a no-fee area, and thus causing more VMT.



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## Safety Subcommittee: Purpose

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*To identify and evaluate the potential impacts to safety brought forth by emerging transportation technologies and business models.*

## Safety Subcommittee: Considerations/Questions we kept in mind:

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- How has emerging technology positively and negatively impacted the public safety?
- What can be done to encourage positive impacts brought forth by emerging transportation technology?
- What can be done to mitigate negative impacts brought forth by emerging transportation technology?
- How do regulations such as the medical certification requirements for TNC drivers fit in?
- What data do we need to adequately assess the impacts of emerging transportation technologies in regard to the public safety?



## Recommendations

### Data

- Gather additional data to improve vehicle miles traveled (VMT) analysis necessary to understand trip generation (e.g., purpose, time of day, replacement vs. new trip)
- Modify the crash form to collect additional data for vehicles driven for commercial purposes (TNCS, car shares, package delivery, and others)
- Gather additional data to better understand the safety impacts of the medical provision and other driver qualifications, certifications, training needs

### Policy

- Review regulations on hours of service among various commercial providers (e.g., TNCS, taxis, car shares, package delivery, and others)
- Evaluate areas to improve hotspot pickup/drop-off locations to promote safety for all road users (e.g., peds, vehicles, freight); develop standard/recommended plan (signing, markings, striping, geometric configuration, etc.) for locations
- Continue to promote research/innovation and provide infrastructure test beds as necessary/helpful, including ADAS and CAV applications

### Education

- Educate Colorado drivers on emerging technologies (e.g., ADAS, TNCS)
- Develop first responder training programs to educate on emerging technology impacts to crash scene management (e.g., EV batteries in a car fire).

## Considerations Regarding the Safety Subcommittee's Recommendations

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- Many of the recommendations may take years for full implementation.
- Continued data and analysis will be critical to fully understand the recommendation's ability to mitigate the negative safety impacts and incentivize the positive impacts.



## Fee Structure Recommendation: Nick Farber, HPTE

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- After four meetings totaling almost ten hours of discussion, the Fee subcommittee could not reach consensus or agreement on a single fee structure. As a result, the Fee Subcommittee recommends:

**The Working Group consider one, or a combination of, the three fee structures modeled: mileage-based, flat, and percent-based**

- The fee structure should take into account the fees already imposed on the commercial vehicles covered by SB 19-239

## Fee Structure Recommendation

### Key Considerations

Fee Type	Pros	Cons
<b>Mileage-Based Fee</b>	<ul style="list-style-type: none"> <li>✓ Best fee structure to meet the goals of SB 19-239</li> <li>✓ Addresses emissions considerations</li> <li>✓ Could capture deadheading</li> </ul>	<ul style="list-style-type: none"> <li>❖ Challenging to administer</li> <li>❖ Highly reliant on the use of technology to track mileage</li> <li>❖ Requires increased data collection</li> <li>❖ Concerns raised around privacy and the type of data collected</li> </ul>
<b>Flat Fee</b>	<ul style="list-style-type: none"> <li>✓ Easiest to administer</li> <li>✓ Requires less data</li> <li>✓ The most common fee to be administered by other cities and states</li> </ul>	<ul style="list-style-type: none"> <li>❖ Doesn't address the goals of SB 19-239 directly. However, funds generated could be used for this purpose</li> <li>❖ Low flat fee modeled was flagged as higher than other cities, outside of New York</li> </ul>
<b>Percent-Based Fee</b>	<ul style="list-style-type: none"> <li>✓ More representative of the length of a trip</li> <li>✓ The most common fee to be administered by other cities and states</li> </ul>	<ul style="list-style-type: none"> <li>❖ Extremely difficult to administer for residential delivery</li> <li>❖ Doesn't address the goals of SB 19-239 as directly as a mileage-based fee. However, funds generated could be used for this purpose</li> </ul>



Break (10 minutes)

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## Stakeholder Recommendation Prioritization Activity



**Q1, Slides 1-5: Which Policy Approach Recommendations are a top priority for your company/organization? (Select 6 Max)**

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P  
Q  
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V

Start the presentation to see live content. Still no live content? Install the app or get help at [PollEv.com/app](https://PollEv.com/app)



## Q2, Slides 6-9: Which Fee Structure + Use of Fee Recommendations are a top priority for your company/organization? (Select 6 Max)

A  
B  
C  
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E  
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H  
I  
J  
K  
L  
M  
N  
O  
P  
Q

Start the presentation to see live content. Still no live content? Install the app or get help at [PollEv.com/app](https://PollEv.com/app)



## Final Stakeholder Working Group Comments

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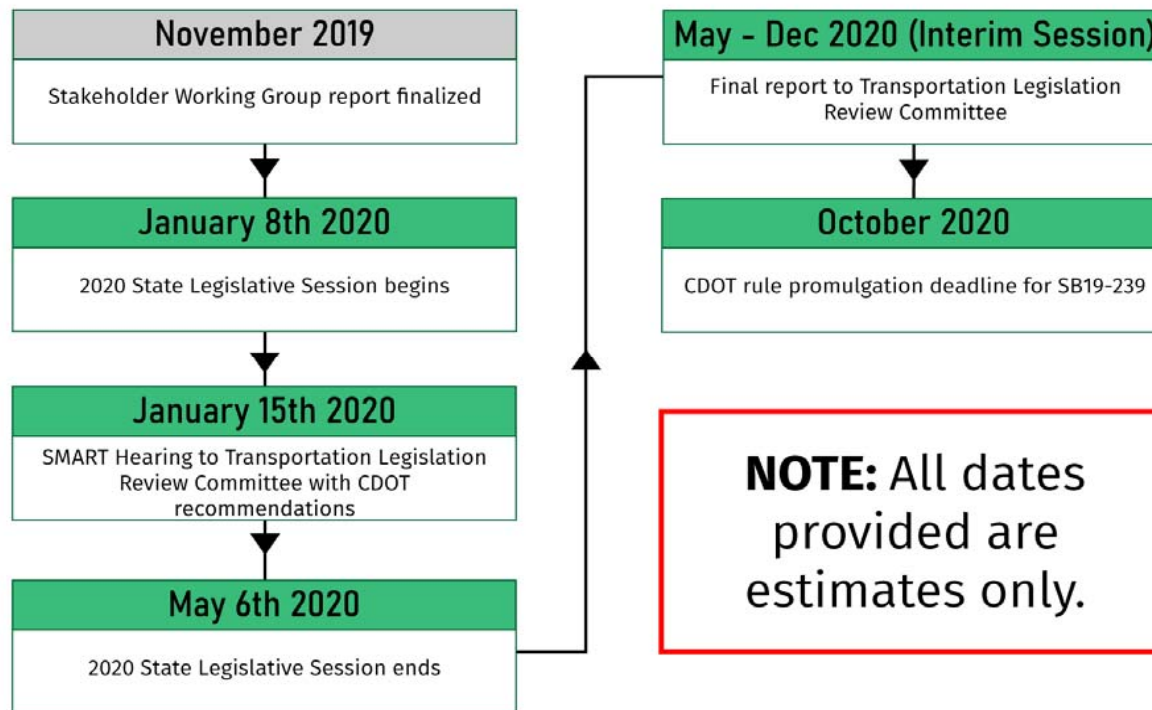
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Reminder: please review the report and submit your comments by November 1<sup>st</sup>

<https://drive.google.com/drive/folders/1PhByDgzHWcBZ1i3HhzyFfevp97Zc9B4O?usp=sharing>



## Moving Forward and Next Steps





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Summary of Fees and Taxes on Emerging Mobility Providers in Colorado												
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Federal	Federal Fuel Tax Gasoline	Federal taxes include excises taxes of 18.3 cents per gallon on gasoline and 24.3 cents per gallon on diesel fuel (eia.gov)	Tax	per fuel purchase	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon	\$0.18 per gallon
Federal	Federal Fuel Tax Diesel	Federal taxes include excises taxes of 18.3 cents per gallon on gasoline and 24.3 cents per gallon on diesel fuel (eia.gov)	Tax	per fuel purchase	\$0.24 per gallon	N/A	N/A	N/A	N/A	\$0.24 per gallon	\$0.24 per gallon	\$0.24 per gallon
Federal	USDOT Fees for Uniform Carrier Registration	Created by the Unified Carrier Registration Act of 2005 (UCR Act - 49 United States Code (USC) section 14504a), it replaces the former system for registering and collecting fees from the operators of vehicles engaged in interstate travel – the Single State Registration System (SSRS). (fmcsa.dot.gov)	Fee	annually	N/A	N/A	N/A	N/A	N/A	Ranges from \$68 for a 2 vehicle fleet to \$66,072 for a 1,000+ vehicle fleet (Evan Kirby)	N/A	N/A
State	FASTER Bridge and Road Safety Surcharge (charged to every vehicle registered)	The FASTER motor vehicle fees are calculated based on multiple vehicle specifications, including class, size, weight, usage, and ownership designations. (CRS 43-4-805(5)(g), CRS 43-4-804(1)(a)(I))	Fee	varies	For vehicles 2,001-5,000 pounds (i.e. most cars, SUVs, light trucks): \$41.00, For vehicles 5,001-10,000 pounds, (i.e. most large trucks and large SUVs): \$51.00. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	For vehicles 2,001-5,000 pounds (i.e. most cars, SUVs, light trucks): \$41.00, For vehicles 5,001-10,000 pounds, (i.e. most large trucks and large SUVs): \$51.00. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	\$2/per day/per rental	For vehicles 5,001-10,000 pounds, (i.e. most large trucks and large SUVs): \$51.00. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	For vehicles 2,001-5,000 pounds (i.e. most cars, SUVs, light trucks): \$41.00, For vehicles 5,001-10,000 pounds, (i.e. most large trucks and large SUVs): \$51.00. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	\$66 for a vehicle (passenger and commercial) 10-16K lbs. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	\$66 for a vehicle (passenger and commercial) 10-16K lbs. Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.	For vehicles 2,001-5,000 pounds (i.e. most cars, SUVs, light trucks): \$41.00, For vehicles 5,001-10,000 pounds, (i.e. most large trucks and large SUVs): \$51.00 Bridge Safety Surcharge ranges from \$13 to \$32, depending on vehicle specifications, Road Safety Surcharge ranges from \$16 to \$39, depending on vehicle specifications.
State	State Fuel Tax Gasoline	Gasoline and gasohol motor fuel taxes are due when acquired from a terminal and removed for distribution. (https://www.colorado.gov/pacific/tax/fuel-taxes-file)	Tax	per fuel purchase	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon	\$0.22 per gallon
State	State Fuel Tax Diesel	Gasoline and gasohol motor fuel taxes are due when acquired from a terminal and removed for distribution. (https://www.colorado.gov/pacific/tax/fuel-taxes-file)	Tax	per fuel purchase	0.205 per gallon	N/A	N/A	N/A	N/A	0.205 per gallon	0.205 per gallon	0.205 per gallon

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State	State EV Registration	In addition to any other fee imposed by this section, each authorized agent shall annually collect a fee of fifty dollars at the time of registration on every plug-in electric motor vehicle. CRS §42-3-304(25)(a)/HB 1110	Fee	annual	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50	Yes Individual \$ 50
State	State Vehicle Registration	Registration required Within sixty days after purchase (42-3-103(1) C.R.S.), Within ninety days after becoming a resident of Colorado. An owner of a foreign vehicle operated within this state (42-3-103(2) C.R.S.), Even a nonresident person who operates a business within this state and owns and operates in such business any motor vehicle trailer, semi-trailer, or trailer coach (42-3-103(3) C.R.S.), Within forty-five days after the owner has returned to the United States (42-3-103(4)(b) C.R.S.) https://www.colorado.gov/pacific/dmv/registration-requirements	Fee	annual	Vehicle registration fees vary by county. CO State Registration Fees are \$6.00 for passenger vehicles up to 2,000 pounds (C.R.S. 42-3-306)	Vehicle registration fees vary by county. CO State Registration Fees are \$6.00 for taxicabs up to 2,000 pounds (C.R.S. 42-3-306)	To register a fleet, a company must apply for a fleet number through the CO DMV. (Laurie from DMV) Vehicle registration fees vary by county. CO State Registration Fees are \$6.00 for passenger vehicles up to 2,000 pounds (C.R.S. 42-3-306)	To register a fleet, a company must apply for a fleet number through the CO DMV. (Laurie from DMV) Vehicle registration fees vary by county. CO State Registration Fees are \$6.00 for passenger vehicles up to 2,000 pounds (C.R.S. 42-3-306)	Vehicle registration fees vary by county. CO State Registration Fees are \$6.00 for passenger vehicles up to 2,000 pounds (C.R.S. 42-3-306)	To register a fleet, a company must apply for a fleet number through the CO DMV. (Laurie from DMV) CO State Registration Fees for trucks and truck tractors registration fees range from \$7.60 for GVW less than 2,000 lbs up to \$203.00 for GVW up to 14,000 lbs (C.R.S. 42-3-306)	To register a fleet, a company must apply for a fleet number through the CO DMV. Then the vehicle registration fees are based on county. (Laurie from DMV) CO State Registration Fees for vehicles weighing more than forty-five hundred pounds, twelve dollars and fifty cents plus sixty cents per one hundred pounds, or fraction thereof, of weight over forty-five hundred pounds (C.R.S. 42-3-306)	Vehicle registration fees are based on county. (Laurie from DMV) CO State Registration Fees for vehicles weighing more than forty-five hundred pounds, twelve dollars and fifty cents plus sixty cents per one hundred pounds, or fraction thereof, of weight over forty-five hundred pounds (C.R.S. 42-3-306)
State	PUC Annual Motor Vehicle Stamp		Fee	annual per vehicle	N/A	\$50	N/A	N/A	N/A	N/A	N/A	N/A
State	PUC annual permit		Fee	annual, per company	\$111,250	N/A	N/A	N/A	N/A	N/A	N/A	N/A
State	State Sales Tax		Tax	varies for vehicle purchase and the value of the product to be delivered (groceries exempt)	2.9% vehicle purchase	2.9% on transaction	N/A	2.9% on transaction	2.9% on vehicle purchase	2.9% to customer on transaction .Vehicles involved in interstate commerce get a refund of sales tax and use tax. The percentage of tax to be refunded will be computed by dividing the non-Colorado miles by the total miles as used in the computation of the specific ownership tax. (Colorado Regulation 39-26-113.5 )	2.9% to customer on transaction and on vehicle purchase	2.9% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
State	Drivers License		Fee	every 5 years	\$ 28.00	\$ 28.00	Usually customer is from out of state, so N/A	\$ 28.00	\$ 28.00	Commercial Driver's License \$15.50	\$ 28.00	\$ 28.00
State	Tolls/Managed Lanes		Fee	per transaction	Individual	passenger	patron	patron	passed on to patron	company	company	contractor
State	Vehicle licensing cost recovery (0.31/day?)						0.83%					
State	Ownership Tax		Tax				2.00%					



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State	Specific Ownership Tax	(State allows rental companies, at their option, to pass a 2% ownership tax to renter)	Tax		An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures) For a Class B truck, less than 16,000 lbs., the taxable value is 75% MSRP. (Evan Kirby)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)	An ownership tax, based on value of the vehicle, is charged by the state and ranges from 2.1 percent of taxable value in the first year to .45 percent after the fifth year (or older). (National Conference on State Legislatures)
State	License plates		fee	one time vehicle purchase	Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Taxicab License Plate was created per House Bill 11-1234 - no special fee (Laurie from DMV)Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Commercial Fleet License Plate - No special fee (Laurie from DMV) Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Commercial Fleet License Plate- No special fee (Laurie from DMV) Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Commercial Fleet License Plate- No special fee (Laurie from DMV) Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Commercial Fleet License Plate- No special fee (Laurie from DMV) Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)	Passenger Car or Truck that do not exceed sixteen thousand pounds empty weight - Fees: One-time fee of \$50.00 for the issuance or replacement of plates. \$25 renewal fee. (https://www.colorado.gov › pacific › dmv › regular-license-plates)
State	Other				Annual application fee for TNC permit	PUC regulates rates: per mile, per minute, baggage, per passenger, zones						
Local and Airport												
Denver	Transaction sales Tax	Often reported as 8.31% which is 4.31% Denver + 2.90% state + 1% RTD + 010% SCFD. Not applicable to services like Uber, Taxis, Grubhub etc.	Tax	per transaction	8.31% on vehicle purchase	8.31% on transaction	N/A	8.31% on transaction	8.31% on vehicle purchase	8.31% to customer on transaction .	8.31% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	8.31% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)

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Denver	Annual Parking (car share)		Fee	per car per dedicated space	N/A	N/A	N/A	Fees are determined by permit type and (if applicable) location, Vehicle Area or Dedicated Space Vehicle Area Permit: Car share vehicles relieved from time limit restriction in excess of (and including) tow hours, Residential Parking Permit restrictions, and meter payment. A. City Wide: \$850/year (this is per car share vehicle)  Dedicated Space: CSO may request to locate vehicles on-street at dedicated spaces, Subject to additional fees but including but not limited to issuance, sign fabrication and installation. A. Meter Displacement: 1/3 (one-third) fully operational meter revenue based on adjacent meter program/rates B. Downtown Area: \$750/year (if meter is not displaced) (this is per car share vehicle) C. Unmetered/City-wide Area:	N/A	N/A	N/A	N/A
Denver	Short Term Car Rental Tax	7.25% Denver+ 2.90% State+1.00% RTD+.10% Cultural Facilities District = 11.25%, 30 days or less	Tax	per transaction	N/A	N/A	11.25%	11.25%	11.25%	N/A	N/A	N/A
Denver	Business License Fee		Fee	annual	\$520	\$520	\$520	\$520	\$520	\$520	\$520	\$520
Aurora	Business License Fee		Fee	annual	\$126	\$126	\$126	\$126	\$126	\$126	\$126	\$126
The district comprises seven counties in the Denver Metropolitan Area: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson	Science and Cultural Facilities District (sometimes displayed as 'Denver County Other')		Tax	per transaction	0.1% on vehicle purchase	Data unavailable	0.1% on transaction	0.1% on transaction	0.1% on vehicle purchase	0.1% to customer on transaction	0.1% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	0.1% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Counties within RTD District	RTD Sales Tax		Tax	vehicle purchase and transaction	1% on vehicle purchase	Data unavailable	0.1% on transaction	1% on transaction	1% on vehicle purchase	1% to customer on transaction	1% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	1% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Denver International Airport	DIA Concession Fee Recovery		Fee	per transaction	N/A	N/A	11.11%	N/A	N/A	N/A	N/A	N/A

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Jurisdiction	Operating Costs	Notes	Tax or Fee	Time Frame	Transportation Network Companies	Taxi	Car Rental	Car Club/Fleets: Non Peer to Peer Car Share	Peer to Peer Car Share	Residential Delivery: Commercial Parcel and Package Delivery (e.g. FedEx, UPS, DHL)	Residential Delivery: Commercial On-Demand Delivery (e.g. 3rd party delivery service partner, establishment based grocery or food delivery)	Residential Delivery: Independent Contractor Package and On-Demand Delivery (e.g. Amazon Flex, Grubhub, Postmates)
Denver International Airport	Customer Facility Charge		Fee	daily per rental			\$2.15	N/A	N/A	N/A	N/A	N/A
Denver International Airport	DIA TNC and Taxi Fee		Fee	per pickup/delivery	\$2.60 both	\$5.03 for pick up	N/A	N/A	N/A	N/A	N/A	N/A
Arapahoe County	Highway Fee		Fee	With Registration	\$12.00, \$10.00, or \$7.00	\$12.00, \$10.00, or \$7.00	\$12.00, \$10.00, or \$7.00	\$12.00, \$10.00, or \$7.01	\$12.00, \$10.00, or \$7.02	\$12.00, \$10.00, or \$7.03	\$12.00, \$10.00, or \$7.04	\$12.00, \$10.00, or \$7.05
Arapahoe County	County General Fund, County Road and Bridge Fund		Fee	With Registration	\$4, \$1.50	\$4, \$1.52	\$4, \$1.52	\$4, \$1.53	\$4, \$1.54	\$4, \$1.55	\$4, \$1.56	\$4, \$1.57
Arapahoe County	Local Sales Tax		Tax	per transaction	3.25% - 8% depending on city on vehicle purchase	3.25% - 8% depending on city on transaction	N/A	3.25% - 8% depending on city on transaction	3.25% - 8% depending on city on vehicle purchase	3.25% - 8% depending on city to customer on transaction	3.25% - 8% depending on city customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	3.25% - 8% depending on city to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Adams County	Local Sales Tax		Tax	per transaction	3.46% -4.5% depending on city on vehicle purchase	3.46% -4.5% depending on city on transaction	N/A	3.46% -4.5% depending on city on transaction	3.46% -4.5% depending on city on vehicle purchase	3.46% -4.5% depending on city to customer on transaction	3.46% -4.5% depending on city customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	3.46% -4.5% depending on city to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Boulder County	Local Sales Tax		Tax	per transaction	Boulder County – 0.985%, City tax rates – 1.0%-4.00% on vehicle purchase	Boulder County – 0.985%, City tax rates – 1.0%-4.00% on transaction	N/A	Boulder County – 0.985%, City tax rates – 1.0%-4.00% on transaction	Boulder County – 0.985%, City tax rates – 1.0%-4.00% on vehicle purchase	Boulder County – 0.985%, City tax rates – 1.0%-4.00% to customer on transaction	Boulder County – 0.985%, City tax rates – 1.0%-4.00% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	Boulder County – 0.985%, City tax rates – 1.0%-4.00% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Roaring Fork Transportation Authority District	Roaring Fork Transportation Authority Transit Tax		Tax	per transaction	0.4% on vehicle purchase	0.4% on transaction	N/A	0.4% on transaction	0.4% on vehicle purchase	0.4% to customer on transaction	0.4% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	0.4% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)
Pikes Peak Regional Transit Authority District	Pikes Peak Regional Transit Authority District Transit Tax		Tax	per transaction	1% on vehicle purchase	1% on transaction	N/A	1% on transaction	1% on vehicle purchase	1% to customer on transaction	1% customer on transaction and on vehicle purchase (note this should also be white because company pays for sales tax when vehicle is purchased)	1% to customer on transaction and on vehicle purchase (note this should also be blue because contractor pays for sales tax when vehicle is purchased)

Summary of Fees and Taxes on Emerging Mobility Providers in Colorado												
Legend: White = Company Tax/Fee, Blue = Contractor Tax/Fee, Yellow = Customer or Individual Tax/Fee												
Jurisdiction	Operating Costs	Notes	Tax or Fee	Time Frame	Transportation Network Companies	Taxi	Car Rental	Car Club/Fleets: Non Peer to Peer Car Share	Peer to Peer Car Share	Residential Delivery: Commercial Parcel and Package Delivery (e.g. FedEx, UPS, DHL)	Residential Delivery: Commercial On-Demand Delivery (e.g. 3rd party delivery service partner, establishment based grocery or food delivery)	Residential Delivery: Independent Contractor Package and On-Demand Delivery (e.g. Amazon Flex, Grubhub, Postmates)
Aspen	Aspen Business License	The City of Aspen requires that any entity doing business within the City limits, either directly or indirectly, obtain a Combined Sales Tax and Business License (PDF). This includes businesses making retail sales and businesses that provide services only.	Fee	annual	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees	\$150- \$750 depending on number of employees