CLEAN TRANSIT ENTERPRISE BOARD MEETING - OCTOBER 4, 2022

SCHEDULE & AGENDA

I.	**Welcome, Roll Call, Agenda Review (5 minutes)** *Matt Frommer, Chair*	**10:30 - 10:35 a.m.**
II.	**Action Agenda (5 min)** *Matt Frommer, Chair* **A. Approval of Minutes - July 13, 2022 CTE Board Meeting**	**10:35 - 10:40 a.m.**
III.	**Enterprise Controller Budget Update (5 min)** *Kay Hruska, (CDOT)*	**10:40 - 10:45 a.m.**
IV.	**Program Administrator Report Out (5 min)** *Kay Kelly, Chief, Innovative Mobility (CDOT)*	**10:45 - 10:50 a.m.**
V.	**EV Planning Requirements (10 min)** *Michael King, Asst Director, Electrification & Energy (CDOT)*	**10:50 - 11:00 a.m**
VI.	**Match approach (15 min)** *Michael King, Asst Director, Electrification & Energy (CDOT)*	**11:00 - 11:15 a.m.**
VII.	**GHG Rule Emissions Calculations for Transit Projects (20 min)** *Theresa Takushi and Libba Rollins, (CDOT)*	**11:15 - 11:35 a.m.**
VIII.	**Transportation Electrification Equity Approach (20 min)** *Kelly Blynn and Zahra Al-Saloom (CEO)*	**11:35 - 11:55 a.m.**
IX.	**Wrap Up and Next Steps (5 min)** *Kay Kelly, Chief, Innovative Mobility (CDOT)*	**11:55 - 12:00 p.m.**

Clean Transit Enterprise

July 13, 2022

Regular Board Meeting – Wednesday, July 13, 2002. 12:00 – 2:00pm, Virtual via Zoom Meeting
Video Recording: https://youtu.be/Jy0V7lVTqj0

1. Call to Order, Roll Call - Time 12:01

Board Members present: Chair Matt Frommer, Director Bonnie Trowbridge, Director Mark Garcia, Director Cris Jones, Director Kelly Blynn, and Director Richard Coffin. Director Dawn Block joined at 12:30 pm. Not present: Vice-ChairDavid Averill, Director Theresa Takushi (excused).

2. Action Agenda - Time 12:05

- A motion by Chair Frommer to approve the meeting minutes from the May 25, 2022 CTE Board Meeting. Seconded by Director Jones. Motion passes unanimously.
- A motion by Chair Frommer to approve the CTE Program Administrator Kay Kelly and Secretary Deseri Scott. Seconded by Director Trowbridge. Motion passes unanimously.

3. Program Administrator Report Out (Kay Kelly) – Time 12:07

- 2 CCR 607-1 Clean Transit Enterprise Processes and Fees rule that was adopted by the board April 12th went into effect on June 14th, allowing for the Department of Revenue (DOR) to begin collection of the Clean Transit delivery fee of $.03 on July 1st. A copy of the final rule is available in the "Resources" section of the CTE website, https://www.codot.gov/programs/innovativemobility/cte.
- The final, formatted, version of the CTE 10 Year Plan is available and posted to the Resources section of the CTE website.

4. Presentation from RTD (Fred Worthen, RTD Assistant Manager for Bus Operations) – Time 12:11

- Overview of low/no emission technology, environmental impacts, fleet performance, and operational challenges of RTD's experience implementing Battery Electric Buses (BEBs). A well-to-wheel comparison of RTDs Mall Ride (battery electric) fleet vehicle, also referred to as Mall Fleet, and 40' Clean Diesel vehicle show little emission reduction since Xcel's energy generation profile is primarily fossil fuel. RTD believes that the real opportunity to reduce the environmental impact of vehicle emission is to keep people out of single-occupancy vehicles and on public transit.
- High-level lessons learned: The Mall Fleet is more efficient on a mile per gallon diesel equivalent, however, the fuel cost per mile is 30% higher than the current Clean Diesel fleet. The Mall Fleet has a higher rate of miles between chargeable road calls. Auxiliary systems are the leading cause of road calls, there have also been multiple planetary drive failures with less than 30,000 miles on the Mall Fleet resulting in a manufacturer recall and replacement of the planetary drives. A significant portion of the Mall Fleet experienced battery degradation beyond 20%, requiring a complete replacement of Mall Fleet battery packs. Range degradation significantly impacted operations. Maintenance cost per mile is also higher for the Mall Fleet, at $1.80, compared to the Clean Diesel fleet, at $.54. The range of the Mall Fleet is significantly impacted by seasonal operating conditions.
- Infrastructure impacts: $450,000 to connect the Xcel transformer to the Platte St. operating base. Additional infrastructure modifications included specialized lifts and a fall restraint system to lift battery packs to the top of the bus. Charging equipment and electric infrastructure footprints took up parking space in the facility.
- Workforce development and training: A shift in technical knowledge, driving habits (to maximize operational range with regenerative braking), and operational awareness are necessary to implement the electric fleet.
- Procurement: Manufacturer supply chain issues are not compatible with RTD's first article build approach where RTD must test and approve one complete bus before allowing the manufacturer to build the remaining buses on order.

Director Jones: Given RTDs preference for clean diesel vehicles would you prefer for this board to make RTD ineligible for these funds moving forward?
Fred Worthen: My objective is to show the operational side of BEBs and the electrification challenges moving forward with current technology. Technologies that may not be available right now, such as hydrogen, might be a better fit for RTD. I would like to share RTD's current experience and dispel misnomers that electricity is clean, and that diesel is dirty.
Director Jones: Have you shared this presentation with King County Metro, which is moving toward a 100% electric fleet?

King County went from an electric catenary transit system directly to BEBs.
Fred Worthen: I have presented on a national level, participated in panels, and am working with the Center for Transportation and the Environment. King County has significantly different operating characteristics (service area, geography, topography, climate) that impact transit service.
Director Jones: What can the CTE do to help accelerate RTD's transition to electric vehicles?
Fred Worthen: RTD is not pro or con electric, or clean diesel, we are trying to transition our fleet in a way that works for RTD's service footprint. Our operating bases are 40-50 years old; they are not suited for large-scale electrification without significant modifications that could cost $100 million per base. We are trying to figure out the most financially responsible way to transition; that could be a mix of clean diesel transitioning to electricity as technology improves. We do have a goal of improving our environmental footprint, but currently, the technology is not ready for large-scale electrification. RTD's Transition Plan should be available in late 2022 or early 2023.
Director Trowbridge: Does RTD have any contractors that operate electric buses or shuttles? Does RTD have any plans to require contractors to use clean fuels and technologies? How can CTE programs be inclusive of these fleets?
Fred Worthen: RTDs fixed route contractors operate on three-year contracts, with two one-year options. Our contractors own two of the four facilities. The two contractor owned facilities were not designed as bus barns and are not conducive to electrification. RTD needs to control these operating bases in order to become more competitive and flexible. Most funding opportunities are geared towards capital, there are no grants to cover increased operational costs, such as a higher than 1:1 replacement ratio or electricity costs, associated with electric vehicle transition.
Director Coffin: Does RTDs greenhouse gas reduction goals include the replacement of old buses? What happens to these old internal combustion engine (ICE) buses? Is there any accounting for the increased emissions from these old buses?
Fred Worthen: The Volkswagen (VW) funds we received require RTD to basically put a hole in the engine block of decommissioned buses. Disposal of goods is dictated by board policy. The remaining old buses are auctioned off (for $3,00-$4,000). RTD does require vendors to dispose of batteries in a way that impacts the environment as little as possible.
Director Coffin: Would RTD be interested in a funding opportunity that provided an extra $2,000-$3,000, and if so, would RTD be open to scrapping the bus rather than selling it?
Fred Worthen: Disposal of goods is dictated by RTDs board policy. We have looked at the cost of disposal methods other than auctioning the vehicles.
Chair Frommer: I am skeptical of the emissions analysis since it is comparing the electric Mall Ride buses that drive slow speeds, with 40' clean diesel buses that operate at higher speeds. The whole point of the CTE board is to electrify transit because of the climate and air quality benefits. How are you thinking about the emissions analysis moving forward? Have you done anything to compare buses on the same route? Have you considered sharing data points from other transit agencies' emissions analyses with the RTD board? It sounds like the take-aways from your presentation is: there are no emission benefits from electric buses and they are twice as expensive – let's not bother with them.
Fred Worthen: The regenerative braking system improves your miles per gallon diesel equivalency. Since the Mall Ride stops every block the regenerative braking system does not work as well as we would expect with the new fleet in a normal operating environment. The accuracy of modeling is dependent on operation conditions (route, climate, driving style, topography). We will be using the pilot to verify our modeling, and then refine long-term impacts and projections. I understand the zero-emission component, but electricity is not made clean - 62% of Colorado's electricity is made from fossil fuels. RTDs used the Argonne National Laboratory's calculator to calculate emissions.

5. MMOF match level presentation (Michael Snow) – Time 12:58

- The Multimodal Transportation and Mitigation Options Fund (MMOF) match structure was developed by an advisory committee and, based on a mathematical formula, can automatically reduce, or even eliminate, the required local match rate for eligible towns, counties, and agencies. The MMOF formula is based on four indicators that reflect the potential for local governments to generate and sustain their revenue: Median Household Income, Median Home Value, Poverty, and Population Aged 65+. The formula grants a reduced rate to 10% of the population and eliminates the match requirement for another 10% of the population.

Director Garcia: What is your overall feel for how this program is working statewide?
Michael Snow: My sense from anecdotal feedback is everyone was pleased, and enabled, by this match reduction. The previous match reduction formula was not well thought out and there were some clear losers. There are still some individual project sponsors looking for additional match reductions (4-6 statewide), but this might be the right balance.

Director Jones: Have there been requests for "boutique" approaches, adding additional factors such as transit usage as a percent of mode share criteria for the formula? We have more work to do to make this unique to the types of funding we seek to provide.
Michael Snow: Most awards are sponsored by towns and counties, and a small share are non-government agencies. If the majority of the CTE awards go to transit agencies, the CTE might need to use Division of Transit and Rail (DTR's) service area data (such as population served) that support a logical formula.
Michael King: How often do you get requests for a variation from the formula? The CTE Board has a secondary exemption process to address cases where the match does not line up with the needs of the applicant.
Michael Snow: We have $212 million being awarded to new projects, I anticipate over 200 new projects identified in the next month. Out of all that we are only dealing with 4-6 requests for additional match reduction. Most funds are allocated to TPRs and MPOs, as the awarding agency they are the ones that review sponsors and advocate for additional match reduction. The MMOF is a mathematical formula intended to show the general financial health of a region, and sponsors asking for the additional match reduction would need to provide justification for additional match reduction. MMOF intentionally does not attempt to measure an entity's current revenues / financial assets. The rationale of most match relief requests has been that "we have a lot of projects or infrastructure problems and just do not have the money". As the originating agency, the CTE can determine the caliber of explanations for the exemption process.
Chair Frommer: Does the MMOF consider using the Enviro Screen tool that the Colorado Department of Health and Environment (CDPHE), or other equity, pollution, and health mapping tools as criteria?
Michael Snow: The MMOF and distribution formula are often confused. The distribution formula uses eight different criteria, many are disproportionately Impacted (DI) indicators, to direct funding. So the level of funding is directed by the area's degree of low-income, minority, and disadvantaged populations.

6. Transit Emissions Dashboard presentation – Time 12:24

- A study for Front Range Passenger Rail (FRPR) indicated that the emissions from electric buses, 0.080 lbs CO2 per passenger vehicle mile traveled (including electricity generation), are less than from an ICE bus, 0.091, and internal combustion engine (ICE) passenger vehicle, 0.293 lbs CO2 per passenger Vehicle Miles Traveled (VMT). The Transit Emissions Dashboard is intended to track the emissions reduction goals and performance measures from HB 19-1261. The dashboard compares emissions from different travel modes, vehicle types in transit fleets, passenger car miles avoided, and emissions by travel mode.

Director Jones: Is there a way to use this tool to compare clean diesel, including noise pollution, to electric buses?
Chair Frommer: Could we use this tool to compare battery electric buses against CNG? Or, grams of CO2 emissions for different fuel types.
Director Block: How can small rural agencies' data be incorporated into the Transit emissions dashboard?
Lisa Streisfield: We can add another informational page with different engine types.
Director Coffin: Could data be presented on a monthly or seasonally basis?
Lisa Streisfield: Daily, or monthly, tracking may be challenging since transit agencies trade out their buses on a daily or weekly basis to manage wear and tear on vehicles. The information from the Federal Transit Administration (FTA) National Transit Database is provided on a yearly cadence. Quarterly might be the next smaller denomination we could examine.
Chair Frommer: Can we track the increase in ridership due to increased gas prices?
Lisa Streisfield: In addition to the price of gas, cost of living and inflation, and electricity costs could also add public value to this dashboard. Information on transportation modes is difficult to get, the national household transportation survey is extracted from census data
Director Frommer: I look at electrification in two ways: fuel switching and mode switching. You could look at VMT or VMT per capita mapped against total transit ridership. Mode split for Single Occupancy Vehicle (SOV) trips, and bicycle and pedestrian trips could also be looked at.
Lisa Streisfield: Our state Transportation Demand Management (TDM) Plan relied on data from the National Household Transportation Survey gathered from census information; it is difficult to find bike, pedestrian, and SOV data. CDOTs Information Management Branch will be doing a statewide travel survey in the near future we might be able to use.

7. Adjournment of public meeting – Time 1:47

8. Executive Session – Time 1:48

- **Under CRS 24-6-402(3)(a)(II) to receive legal advice and an update from counsel on a lawsuit filed against CTE and to discuss with counsel and receive advice on legislation passed by the Colorado Legislature.**
- Motion to convene the Board of Directors in executive session by Director Jones, seconded by Director Garcia. The motion passes by at least 2/3rd vote of the board.

DATE: August 9, 2022

TO: Kay L. Kelly, Chief, Innovative Mobility, CDOT

FROM: Boulder Transportation Advocacy Coordination Team (BTACT) and Members of a Regional Partnership

RE: Regional Innovative Partnership Solutions to Mobility, Beneficial Electrification

Dear Kay,

We are writing as members of the Boulder Transportation Advocacy Coordination Team (BTACT), to express our support of your work to implement the Clean Transit Enterprise Board's ten-year plan that will guide the distribution of SB21-260 funds.

BTACT is facilitated by the Boulder Chamber/Boulder Transportation Connections, consists of transportation leaders from Boulder County, City of Boulder, CU Boulder, and Boulder Transportation Connections, and its mission is to secure funding for and advance sustainable transportation projects and to champion sustainable transportation legislation that impact Boulder County communities. BTACT members are interested in electrifying our transportation sector and are actively exploring a variety of innovative possibilities toward that end.

We envision that our region could become a model for how recipients of state grant funds can increase efficiencies through resource sharing among public and private entities. As you prepare to move into the grant phase of your work, we ask that you keep our work in mind for funding eligibility.

Shared Electric Fleet Charging, Maintenance, Repair and Workforce Development

We want to bring to your attention one project that is well underway. Under a cooperative agreement between the City of Boulder, Via Mobility Services, (Via), Xcel Energy, University of Colorado Boulder (CU Boulder), and the Boulder Valley School District (BVSD), the project involves a plan to fund and build a shared electric bus charging, maintenance, repair and workforce development facility on a 4.5-acre parcel in Boulder adjacent to Via's operational headquarters and maintenance facility that will accommodate the collective and growing transit, university and school bus electric fleets expected over the next decade in Boulder. The land was recently purchased by Via, and next steps involve assessing each agency's electric bus fleet program needs and developing a related conceptual facility site plan to best maintain and charge with renewable energy the Via, City of Boulder, CU Boulder, and BVSD electric bus fleets planned in the coming years. The resulting site plan concept and related program plan will inform order of magnitude costs for facility construction, potential funding requests, and subsequent preliminary and final design and engineering efforts to advance facility construction and program implementation.

The shared electric bus charging facility project includes a critical workforce development component. As electrification of the transportation sector advances, the need for worker training and retraining is high as the mechanics of today move from familiarity of working with internal combustion engines to electric vehicles. The transition is an opportunity to address our region's workforce development and diversity, equity, and inclusion goals through strategic outreach to targeted communities about becoming trained and starting careers in the electric vehicle sector.

In a supportive effort, Via and the City of Boulder are also seeking to fund a solar microgrid and battery storage system at Via's operations and maintenance center that can power electric charging infrastructure for Via and City electric buses

and transit fleet vehicles, as well as Via's 37,000 square foot headquarters building and 10,000 square foot maintenance facility (Figure 1). Funding and implementing Via's microgrid project will maximize the charging capacity at Via's existing operations and maintenance center and complement and expand the charging capabilities of the adjacent planned shared electric bus charging facility.

Figure 1: Via Mobility Services Solar Microgrid Project, Phase 1 conceptual rendering

The City of Boulder and Via are actively seeking initial funding for phased microgrid development. Earlier this year, the City of Boulder sought initial funding for the first phase of the microgrid project by working with Senator Hickenlooper's office to submit a congressionally directed spending request with local match committed by Via and the City for the purchase and installation of solar panels, electrical equipment, and a 500kW solar microgrid battery with the capability to charge eight electric HOP buses at Via's operational headquarters and maintenance facility.

It is estimated that this project will directly eliminate approximately 500 metric tons of diesel-based emissions and approximately 500 metric tons of electricity-based emissions on an annual basis. As Boulder is in a non-attainment zone, this emissions reduction is a welcome benefit to residents. Although this initial congressionally directed spending request was advanced for final consideration along with several other projects, it was subsequently not selected to receive this federal funding. The City of Boulder and Via continue to pursue additional funding pathways to begin the phased development approach.

Sequential microgrid phases will incrementally add more solar panels, battery storage, and charging equipment to charge additional city HOP bus, Via paratransit, and Via support vehicle fleets as they transition from diesel to electric and to power Via's operational headquarters and maintenance facility. This catalyst microgrid project at Via is envisioned as the first phase to sustainably power transit fleets in Boulder, and the microgrid may have the potential to be expanded or replicated to sustainably power the shared electric bus charging facility and additional electric transit vehicles in Boulder.

Thank you for your important service to the state. **We would welcome an opportunity to present before your Board to describe our proposals in more detail.** Please feel free to reach out to Kirsten Schuchman Kirsten.Schuchman@colorado.edu or Carl Castillo castilloc@bouldercolorado.gov with any questions.

Sincerely,

BTACT Members:

With support from the shared electric bus charging, maintenance, repair and workforce development facility partnership:

COLORADO
Department of Transportation

Clean Transit Enterprise Board

October 4, 2022

AGENDA

Topic	Presenter
Welcome, Roll Call, Agenda Review (5 min)	Matt Frommer, Chair
Action Agenda (5 min) • Approval of Minutes - 7/13/22 CTE Board Meeting	Matt Frommer, Chair
Enterprise Controller Budget Update (5 min)	Kay Hruska, CDOT
Program Administrator Update (5 min)	Kay Kelly, CDOT
EV Planning Requirements (10 min)	Mike King, CDOT
CTE Matching Funds Approach (15 min)	Mike King, CDOT
GHG Rule Emissions Calculations for Transit Projects (20 min)	Theresa Takushi & Libba Rollins, CDOT
Transportation Electrification Equity Approach (20 min)	Kelly Blynn, CEO
Adjournment	Matt Frommer, Chair

Enterprise Controller Update

CTE Accounting Update

Year-To Date Figures

- Retail Delivery Fee totaled $655,067 through August 31, 2022
- For FY22-23, CTE has paid all expenses using Transportation Loan Proceeds
- FY22-23 Expense Detail
  - Staff Salaries $2,769
  - Attorney General Fees $274

Future Expenses

- Going forward, all expenses will be paid from the Retail Delivery Fee and not Transportation Loan Proceeds

CTE Accounting Update

Transportation Commission Loan

- In FY21-22 CTE was issued a Transportation Commission Loan to cover CTE expenses prior to when revenue would begin flowing into the Enterprise
  - $74,350
  - 2% Interest Rate
- CTE has spent $16,600 of the loan proceeds leaving $57,750 remaining
- Total accrued interest is approximately $550.88
- CTE has repaid the Transportation Commission Loan, totaling $74,900.88

CDOT Revenue Forecasting

Inputs

National Economic Data

State Population Data

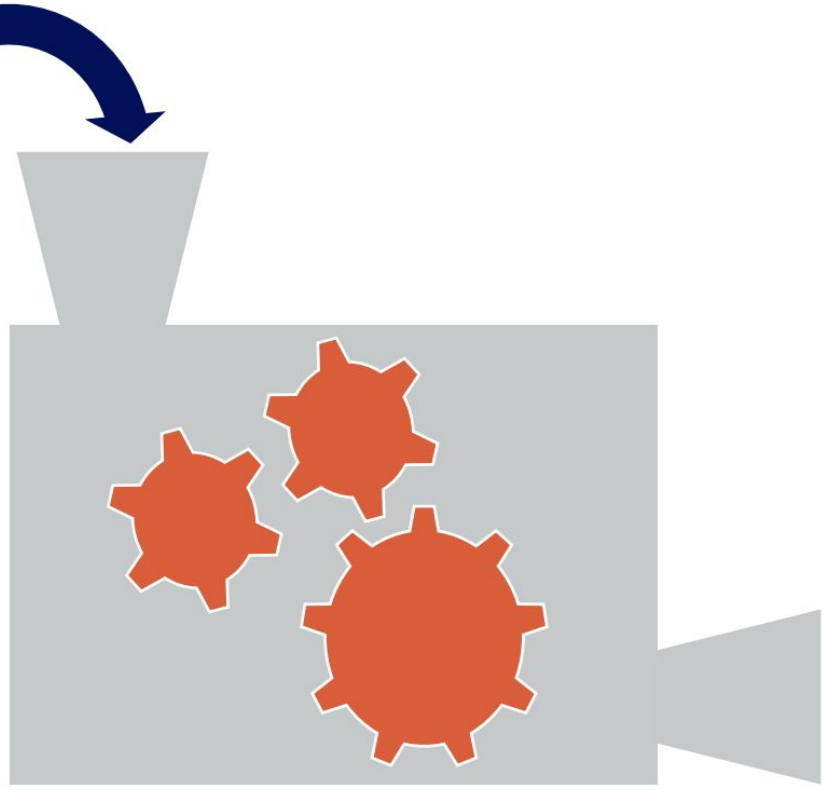
Motor Vehicle Data

DOR Data

Licenses Issued

VMT Data state & national

Motor Fuel Revenue Data



Projections

State Revenues

Federal Revenues

Grant Revenues

Misc. Revenues

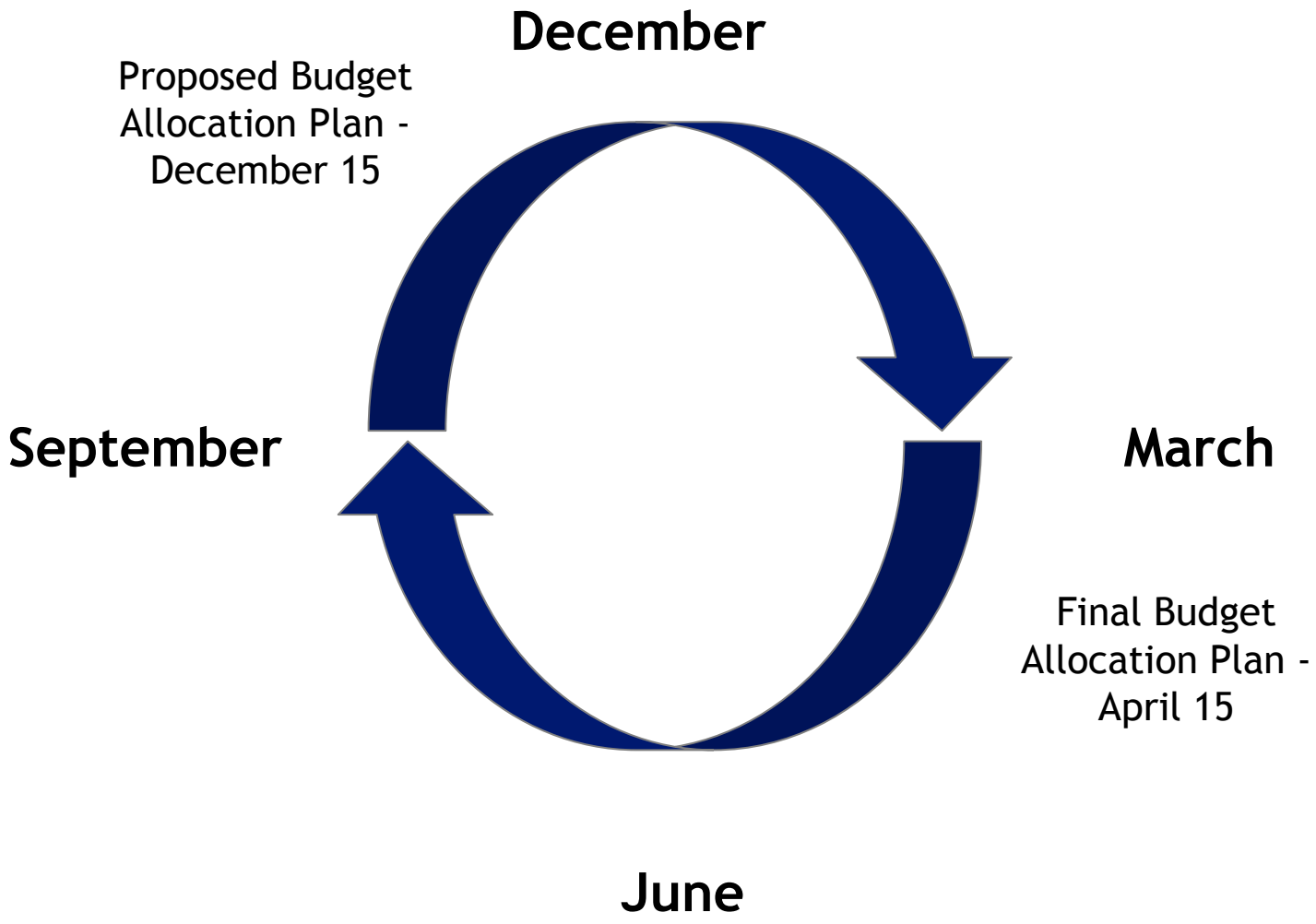
Enterprise Revenues

Quarterly Forecasting Schedule

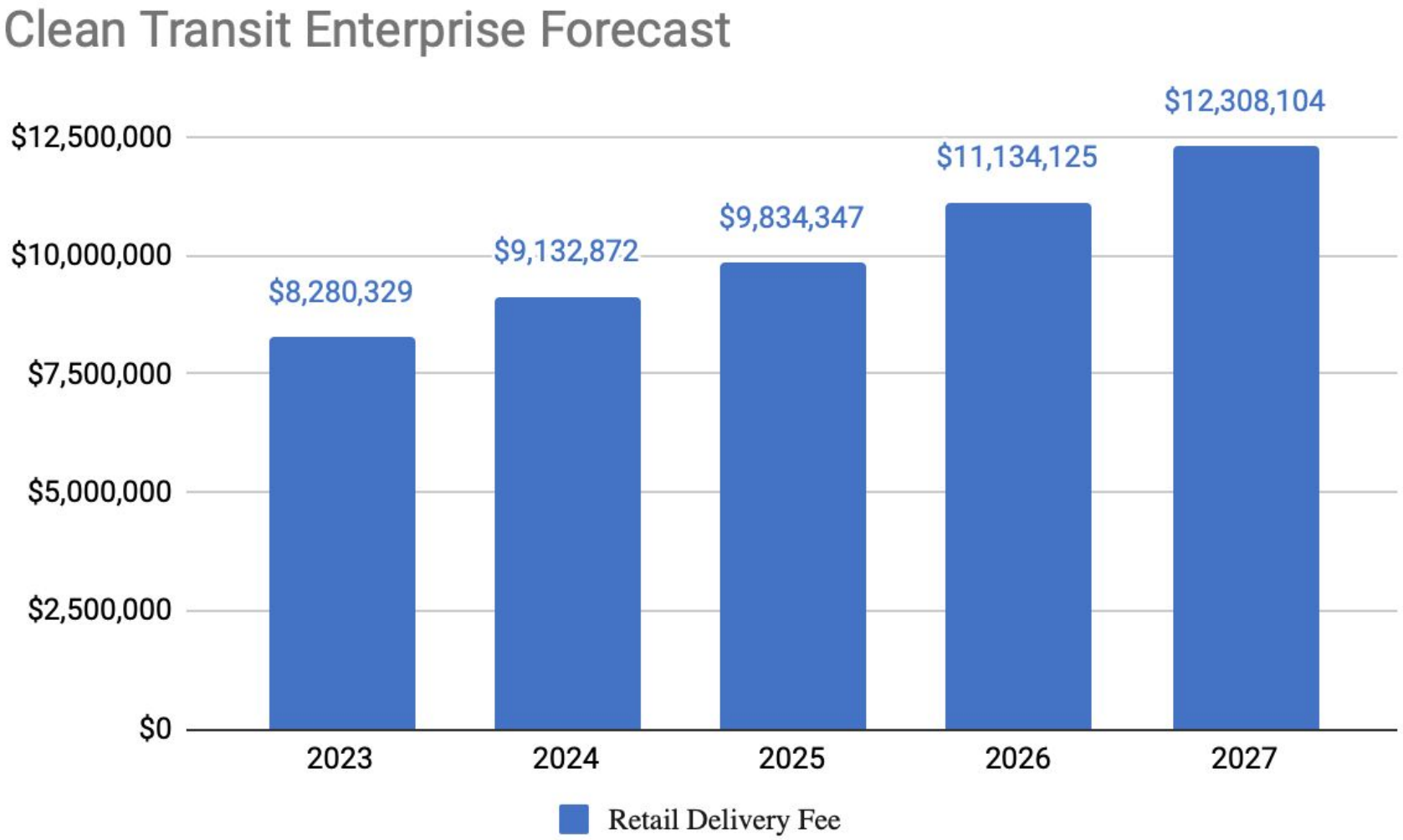
OFMB staff does a quarterly revenue forecast for to track how revenues are performing against budget expectations.

In general, the Proposed Budget Allocation Plan is developed using the September forecast.

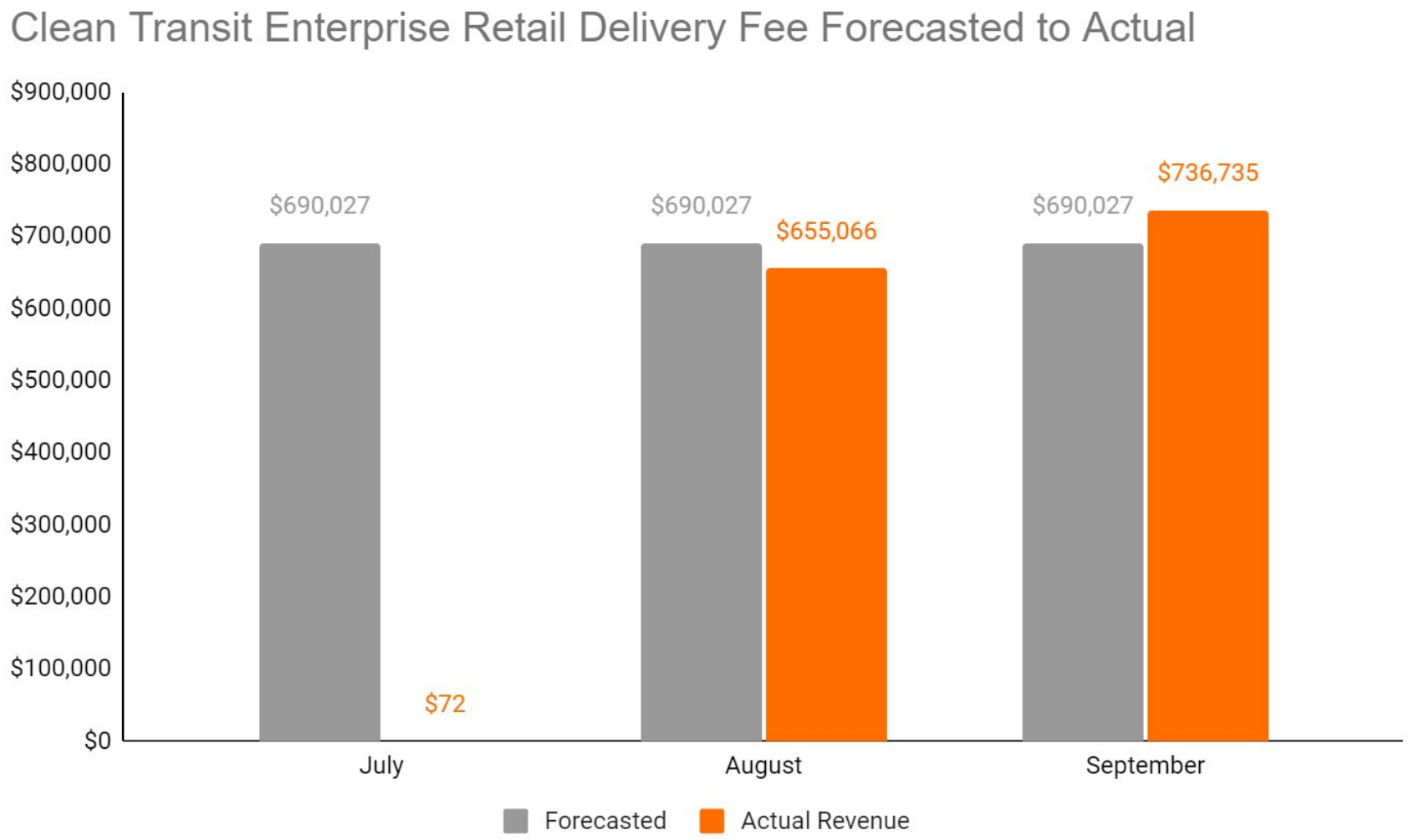
The forecast for the Final Revenue Allocation Plan may be updated if there are major changes in the December forecast.



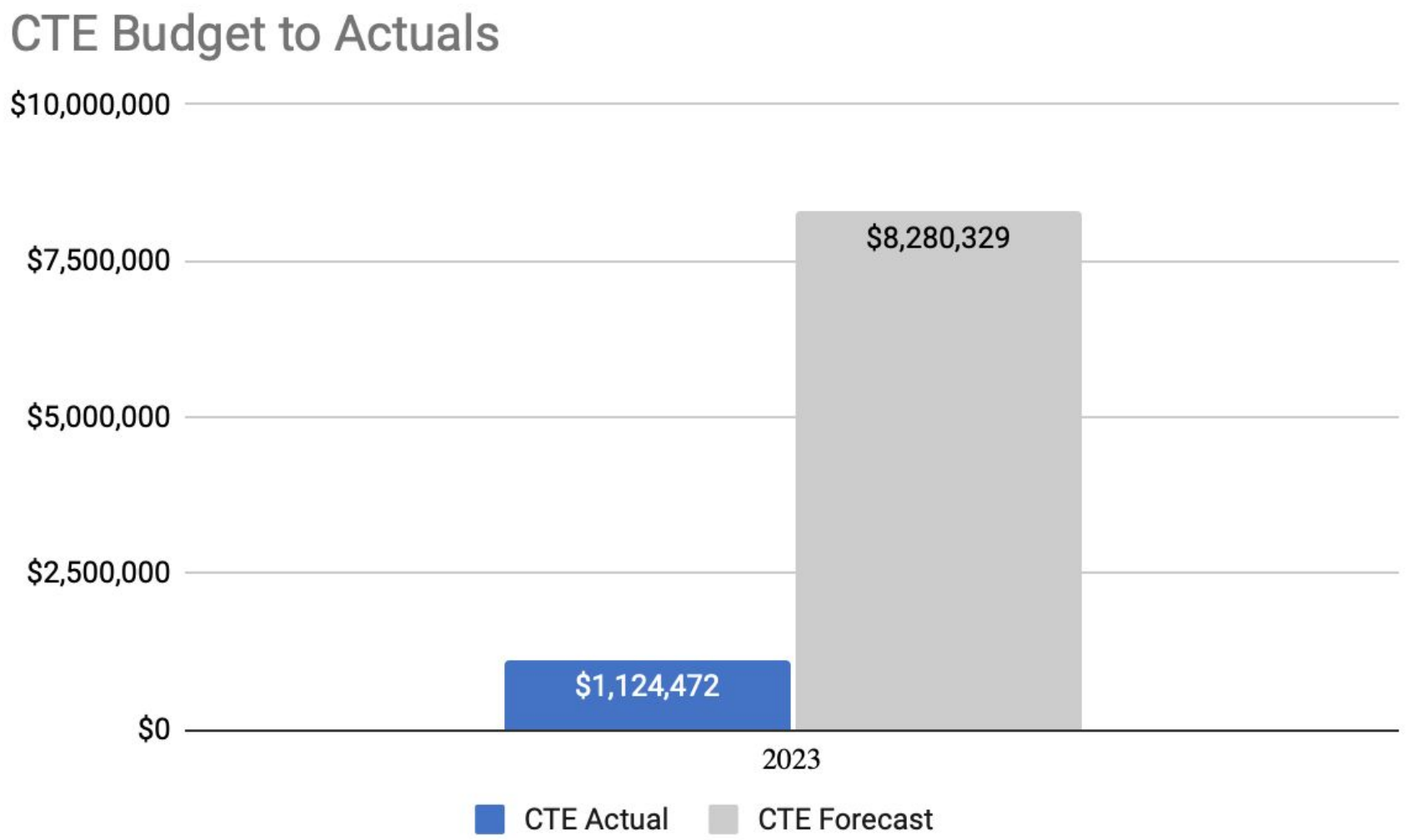
CTE Revenue Forecast



Clean Transit Enterprise - Retail Delivery Fee



CTE Budget to Actuals (as of 9/21/2022)



SB261-260 Fees

Fee Collection

- Most retailers will file the retail delivery fee monthly to coincide with the state sales tax deadline
- Some smaller retailers will file quarterly or annually, so months at the end of the quarter (March, June, September, and December) or calendar year (December) may have higher values
- First returns were filed August 22nd
- Actual number of retailers that make deliveries will be more clear in February

Program Administrator Update

Program Administrator Update

General:

- Correspondence to CTE Board
  - Letter to the Board from Boulder Transportation Advocacy Coordination Team
- Drafting CTE's first required annual report to the Legislature and Transportation Commission

Remaining Decisions from 10 Year Plan:

- Project Scoring Criteria (required prior to issuing CTE funding opportunities)
  - Applicant Planning Requirements
  - Emissions Calculation Methodology
  - Match Structure/Match Relief Policy
  - Equity Approach
- Data Reporting Requirements (required prior to issuing CTE funding awards)

Applicant Planning Requirements

Applicant Planning Requirements

10 Year Plan Development

- During the development of the CTE 10 Year Plan, board members, stakeholders, and agency staff identified a need for transit agencies to demonstrate some level of advanced planning when applying for vehicle, infrastructure, or facility grants
    - This ensures that awarded agencies have the ability to deliver on their projects without unexpected delays or unforeseen barriers
- At the same time, it is important that planning requirements do not present an additional barrier to entry for agencies attempting to begin their fleet transition

FTA Applicant Planning Requirements

FTA Planning Requirements

- As of the most recent round of FTA 5339 grants, applicants for electric transit vehicles were required to provide answers to six key questions related to their transition planning:
  - long-term fleet management plan and how the current application supports it;
  - availability of current and future resources to meet costs for the transition and implementation;
  - policy and legislation impacting relevant technologies;
  - evaluation of existing and future facilities and their relationship to the technology transition;
  - partnership of the applicant with the utility or alternative fuel provider;
  - impact of the transition on the applicant's current workforce and skills necessary to address existing gaps.

CDOT VW Applicant Planning Requirements

CDOT Planning Requirements for Settlement Program

- In contrast to FTA's six-point planning requirement, CDOT has historically required a more in-depth set of questions (approximately 8 pages) to be addressed by agencies seeking VW Settlement Program grants for vehicles and infrastructure

- Not every applicant has full, comprehensive answers to every question, but the process of addressing them helps to highlight areas of uncertainty and improve implementation overall

- To assist transit agencies in meeting these requirements, CDOT staff have developed and shared additional resources including the ZEV Transit Roadmap Financial Analysis Tool, a ZEV Transition Plan template, and more.

Proposal for CTE Applicant Planning Requirements

Staff Proposal

- Based on past experience and the approach used by similar federal and state programs, staff recommend that the CTE require the six-point planning requirement consistent with FTA as a minimum requirement for grantees with extra weight given to applicants who complete an update and adapted version of the Settlement Program questionnaire.

- Any transit agency with a fully documented fleet transition plan should also provide that as part of their grant application, as it should cover both of the above and then some.

- Discussion today and bring to Board for formal approval in November

CTE Match Approach

CTE Match Approach

10 Year Plan Development

- During the development of the CTE 10 Year Plan, board members, stakeholders, and staff identified the need for a grantee match strategy that accounts for different types of projects (e.g. planning versus capital) and differences in available local resources
    - Without accounting for this element, larger and better resourced agencies would be able to take advantage of CTE funding opportunities, while smaller and more tightly constrained entities might be left behind
- In order to consistently and fairly determine the appropriate match level for a given agency, the formula model employed in CDOT's Multimodal & Mitigation Options Funds (MMOF) Program was suggested as a potential starting point

MMOF Match Approach

- In the last Clean Transit Enterprise board meeting, Michael Snow from CDOT DTD shared the MMOF match formula, which determines match percentages based on four county or municipal level data points:
  - Median Household Income
  - Median Home Value
  - Poverty Level
  - Population Aged 65+

- The MMOF formula also includes a process for applicants to seek full match relief when circumstances merit, which has been used on limited occasions

- This approach has been a success, but transit agency service areas and funding resources don’t neatly align with county or municipal boundaries

Options for CTE Match Approach

Staff Proposal - 2 Options

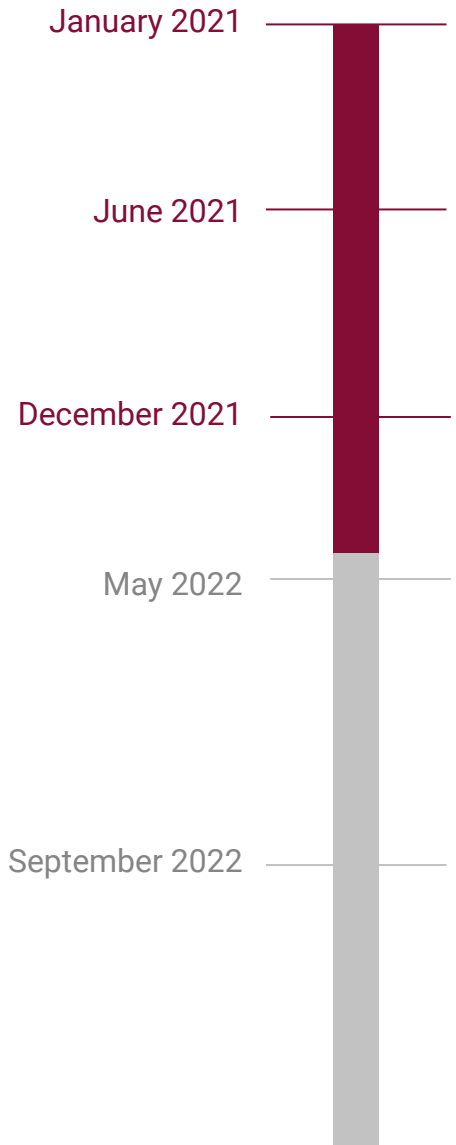
- The CTE could apply a standard match percentage requirement across all agencies (such as 20% or 10%), with a process for seeking match relief when merited
  - Under this approach, required match percentage might still vary by project type (i.e. less match for planning, more match for facilities, etc.) and/or by agency size (e.g. Large Urban, Small Urban, Rural)

- The CTE could develop a formula akin to the one used by MMOF, but drawing from more transit-relevant inputs such as service miles, farebox revenues, etc.
  - Under this approach, the CTE may consider forming a subcommittee to discuss between now and November meeting

GHG Emissions Calculations for Transit Projects

Overview: PD 1610 and GHG Mitigation Measures

Intent: Encourage CDOT and MPOs to develop long range transportation plans that support travel choices that reduce GHG emissions.



January 2021

Colorado GHG Pollution Reduction Roadmap

Identified the transportation sector as the largest source of GHG emissions in Colorado, and a GHG standard for transportation planning was identified as a key strategy.

June 2021

SB 21-260

The state transportation funding bill made the Roadmap recommendation for transportation planning a requirement.

December 2021

Transportation Commission approves GHG Pollution Reduction Planning Standard

May 2022

Transportation Commission adopts Policy Directive 1610

GHG Mitigation Measures are an important, but voluntary, component of the GHG Transportation Planning Standard. Policy Directive 1610 provides an additional compliance mechanism for CDOT and the state's five MPOs to meet the GHG Reduction Levels found in the Planning Standard.

September 2022

Transportation Commission approves the *GHG Transportation Report* of CDOT, DRCOG, and NFRMP

Agencies are in compliance with GHG Planning Standard. PPACG, PACOG, and GVMPO will be subject to the Rule following October 1, 2022.

Overview: GHG Mitigation Measures

What are they?

Projects or strategies whose GHG and travel benefits cannot be accurately or easily quantified in all travel demand models.

What transit-related GHG Mitigation Measures are in PD 1610?

- MD/HD Electrification - electric, hybrid, CNG transit bus; electric school bus; medium and heavy duty electric truck
- New/increased fixed-route electric bus service - local and intercity
- User-input method for new transit service
- Hydrogen refueling infrastructure

*Note - none of the calculation methodologies consider upstream/fuel cycle emissions

Project Type 1: MD/HD Electrification

Project Type	Metric	Project Lifetime (Years)[1]	Points/ Metric[2] Now-2025[3]	Points/ Metric 2026-2030	Points/ Metric 2031-2040	Points/ Metric 2041-2050
MD/HD[20]						
Replace diesel transit buses with battery-electric buses	Number of new vehicles introduced between baseline plan year 1and evaluation year	12	92	85	-	-
Replace diesel transit buses with hybrid diesel-electric buses			15	14	-	-
Replace diesel transit buses with RNG bus			37	34	-	-
Replace diesel school buses with electric buses	Number of new vehicles introduced between baseline plan year 1and evaluation year		12	11	10	10

Project Type 1: MD/HD Electrification Calculation Methodology

$$CO_2\ tons = miles\ per\ year * (g/mi\ [electric] - g/mi\ [diesel])$$

Benefits:
Simple!

Limitations:
Does not consider ridership, estimated displacement

Project Type 2: New/expanded transit service

Transit						
Project Type	**Metric**	**Lifetime (Years)**	**Points/Metric 2025**	**Points/Metric 2030**	**Points/Metric 2040**	**Points/Metric 2050**
New local fixed route - *electric*	Per 1,000 VRH in evaluation year	1	31	25	15	7
New local fixed route - *fleet average*	"	1	10	20	15	7
New intercity fixed route - *electric*	Per 1,000 VRM in evaluation year	1	2	2	1	1
New intercity fixed route - *fleet average*	"	1	3	3	1	1

Works for **NEW** transit lines - DOES NOT assume a replacement of diesel/gasoline vehicle.

Project Type 2: New Transit Service Calculation Methodology

NEW LOCAL LINES

NEW INTERCITY LINES

$$tons\ CO_2 = [-displaced\ auto\ emissions + electric\ bus\ emissions]$$

$$displaced\ auto\ emissions = \frac{1000 * \cancel{\frac{VRM}{VRH}} * \frac{PMT}{VRM} * prior\ mode\ share\ of\ new\ riders * \left(\frac{CO_2 g}{mile}\ auto\right)}{1{,}000{,}000}$$

$$electric\ bus\ emissions = 0$$

Project Type 2: Variables

Parameter	2025	2030	2040	2050	Metric; Source/Calculation
Parameters Common Across Strategies					
Vehicle revenue-miles per revenue-hour					
Fixed-route bus	13.0	13.0	13.0	13.0	NTD (2019), Colorado agencies
Demand-response bus	13.7	13.7	13.7	13.7	NTD (2019), Colorado agencies
Passenger-miles per vehicle-mile					
Fixed-route bus	11.5	11.5	11.5	11.5	NTD (2019), Colorado agencies - Rapid Bus (RB) service
Demand-response bus	3.5	3.5	3.5	3.5	NTD (2019), Colorado agencies
grams CO2 per vehicle-mile					
Fixed-route bus	1,555	399	-	-	CDOT (2021) - high bus electrification (100% electric by 2033)
Demand-response bus	619	159	-	-	2019 based on medium truck MPG from AEO, future years adjusted proportional to fixed-route bus
Auto	341	281	163	77	CDOT (2021) - high EV scenario
Intercity bus	778	200	-	-	2x MPG of urban bus
grams CO2 per vehicle-hour					
Fixed-route bus	3,966	1,018	-	-	CS (2021), scaled by g/mi from CBA analysis for future years
Prior drive mode share of new riders	60%	60%	60%	60%	CS (2021)
Prior drive mode share of new riders (intercity)	80%	80%	80%	80%	
Average trip length (mi) - unlinked					
Fixed-route bus	4.5	4.5	4.5	4.5	FHWA CMAQ Calculator Toolkit
Demand-response bus	4.5	4.5	4.5	4.5	Assumed same as fixed-route
Annualization factor	300	300	300	300	

Project Type 3: User Input Method - RECOMMENDED METHODOLOGY

User-input method for new transit service					
Planned new annual vehicle revenue-miles	130,000	143,000	157,300	173,030	Agency service plan
Anticipated new ridership (annual unlinked trips)	390,000	429,000	471,900	519,090	Agency estimate based on survey, model, or similar service
Anticipated share of new riders who previously drove or used a taxi/TNC	60%				Agency estimate based on rider surveys or local mode shares. Use 60% if no local data available.
Average unlinked trip length of new riders (mi)	4.5				Agency estimate based on rider surveys, models, or data. Use 4.52 if no local data available.
Transit vehicle size	35-40' bus				Agency service plan
Transit vehicle technology	fleet average	fleet average	electric	electric	Agency service plan
Average load factor for new service	13.6	13.6	13.6	13.6	= new riders * trip length / new revenue-miles
Change in annual auto VMT	(1,057,680)	(1,163,448)	(1,279,793)	(1,407,772)	= new riders * trip length * prior drive mode share
Change in annual tons CO2					
Displaced auto	(361)	(327)	(209)	(108)	= change in auto VMT * C3 / 1000000
New bus service	202	57	-	-	= 1000 * C1 * A1 * / 1000000
Net change	(158)	(270)	(209)	(108)	= new bus + displaced auto
Points	158	270	209	108	

- Allows for customization!
- Takes into consideration vehicle mileage, ridership, and estimated displacement of automobile trips
- Easily modifiable to also calculate a replacement of a diesel/gasoline vehicle
- 35-40’ bus and 15-20’ van option
- CNG, diesel, electric, and hybrid electric

Proposal for CTE GHG Emissions Calculations

Staff Proposal

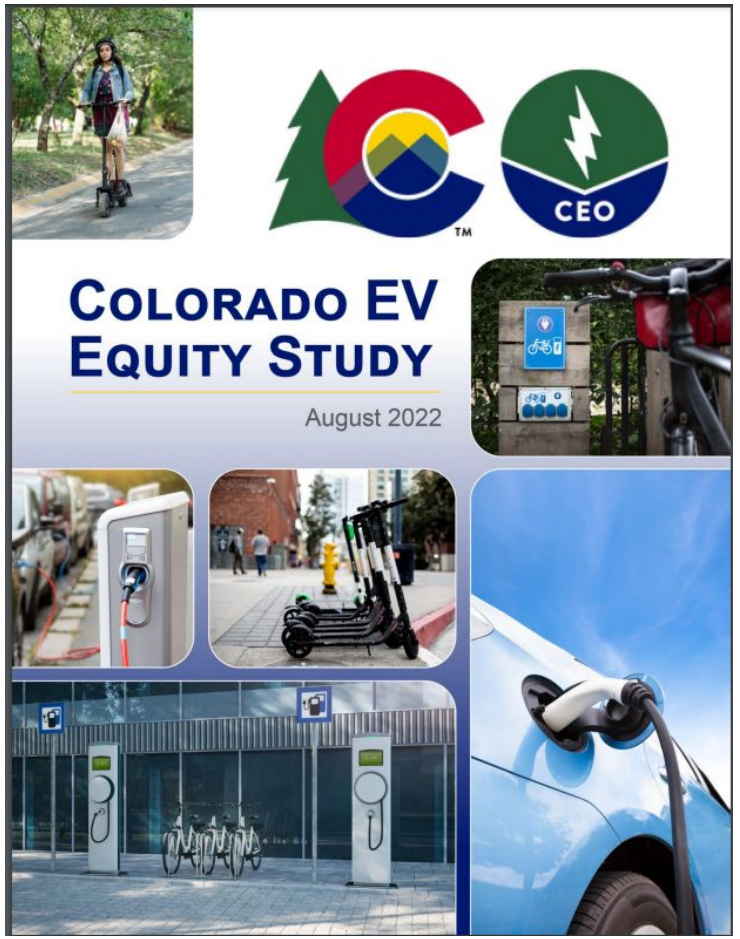
- Align CTE GHG calculation methodology with CDOT Policy Directive 1610 GHG Mitigation Measures Calculation Table (User Input Method)

- Discussion today and bring to Board for formal approval in November

EV Equity Approach

EV Equity Study

- **Purpose:** To "help State agencies ensure that the benefits of vehicle electrification is available to all Coloradans"
- Identifies barriers to EV access and identifies opportunities for equity-centered approach to electrification and stakeholder engagement
- Study: https://energyoffice.colorado.gov/about-us/reports
- Tools: https://energyoffice.colorado.gov/zero-emission-vehicles/ev-equity-dashboard



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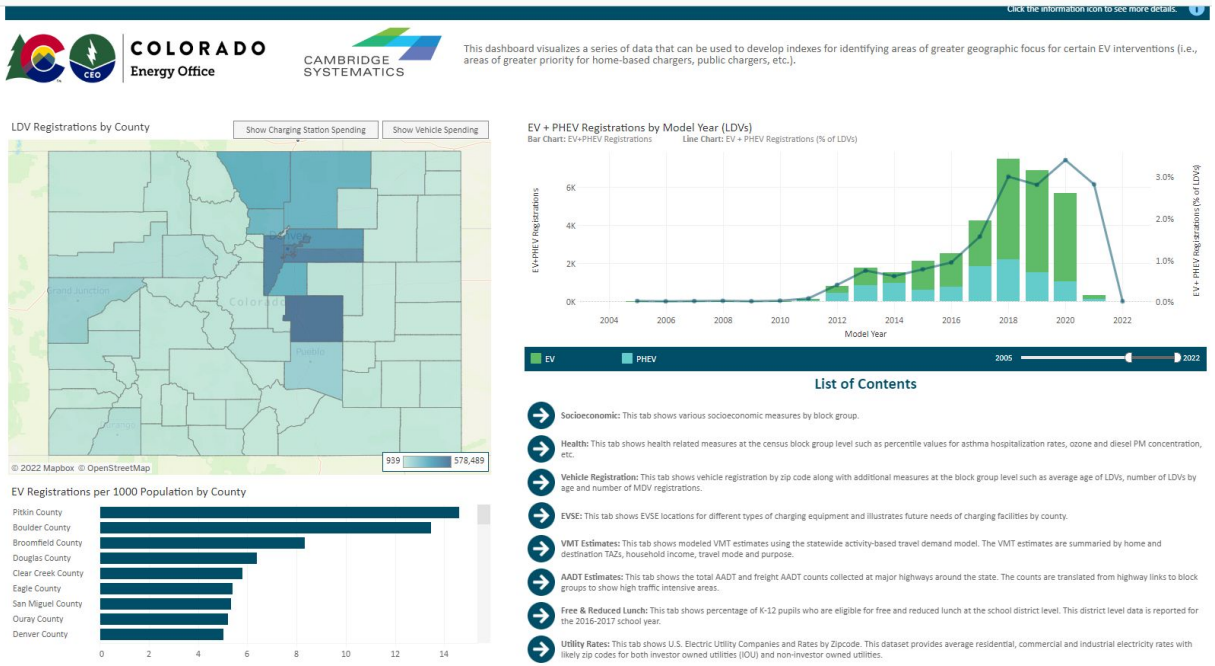
EV Equity Dashboard

- Shows trends on a yearly basis
- Investments made through electrification programs
- Various indexes/layers
  - Socioeconomic
  - Health
  - By County
  - Vehicle Registration
  - EVSE
  - VMT Estimates
  - Utilities



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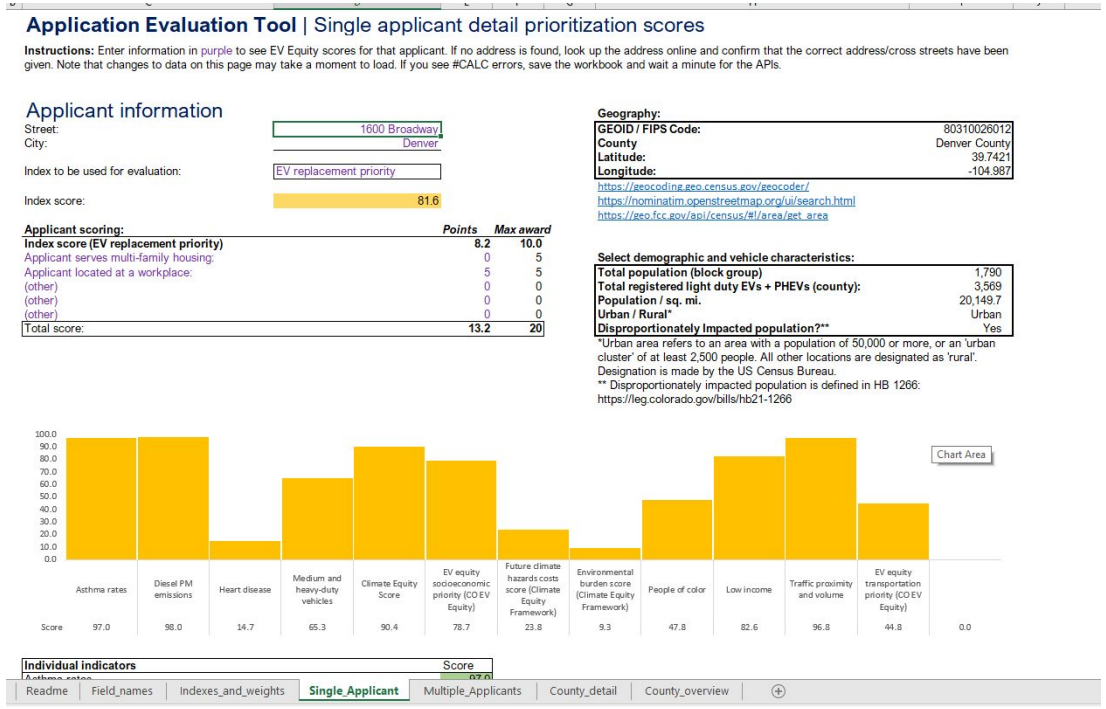
EV Prioritization Tool

- Rapid prototyping tool
- Various indicators can be weighted depending on program needs and targets
- Forecast funding opportunities and priority areas



Application Evaluation Tool | Single applicant detail prioritization scores

Instructions: Enter information in purple to see EV Equity scores for that applicant. If no address is found, look up the address online and confirm that the correct address/cross streets have been given. Note that changes to data on this page may take a moment to load. If you see #CALC errors, save the workbook and wait a minute for the APIs.

Applicant information

Street: 1600 Broadway
City: Denver

Index to be used for evaluation: EV replacement priority

Index score: 81.6

Applicant scoring:	Points	Max award
Index score (EV replacement priority)	8.2	10.0
Applicant serves multi-family housing:	0	5
Applicant located at a workplace:	5	5
(other)	0	0
(other)	0	0
(other)	0	0
Total score:	13.2	20

Geography:

GEOID / FIPS Code:	80310026012
County	Denver County
Latitude:	39.7421
Longitude:	-104.987

https://geocoding.geo.census.gov/geocoder/
https://nominatim.openstreetmap.org/ui/search.html
https://geo.fcc.gov/api/census/#!/area/get_area

Select demographic and vehicle characteristics:

Total population (block group)	1,790
Total registered light duty EVs + PHEVs (county):	3,569
Population / sq. mi.	20,149.7
Urban / Rural*	Urban
Disproportionately Impacted population?**	Yes

*Urban area refers to an area with a population of 50,000 or more, or an 'urban cluster' of at least 2,500 people. All other locations are designated as 'rural'. Designation is made by the US Census Bureau.
** Disproportionately impacted population is defined in HB 1266: https://leg.colorado.gov/bills/hb21-1266

Individual indicators	Score
Asthma rates	97.0

Readme | Field_names | Indexes_and_weights | Single_Applicant | Multiple_Applicants | County_detail | County_overview

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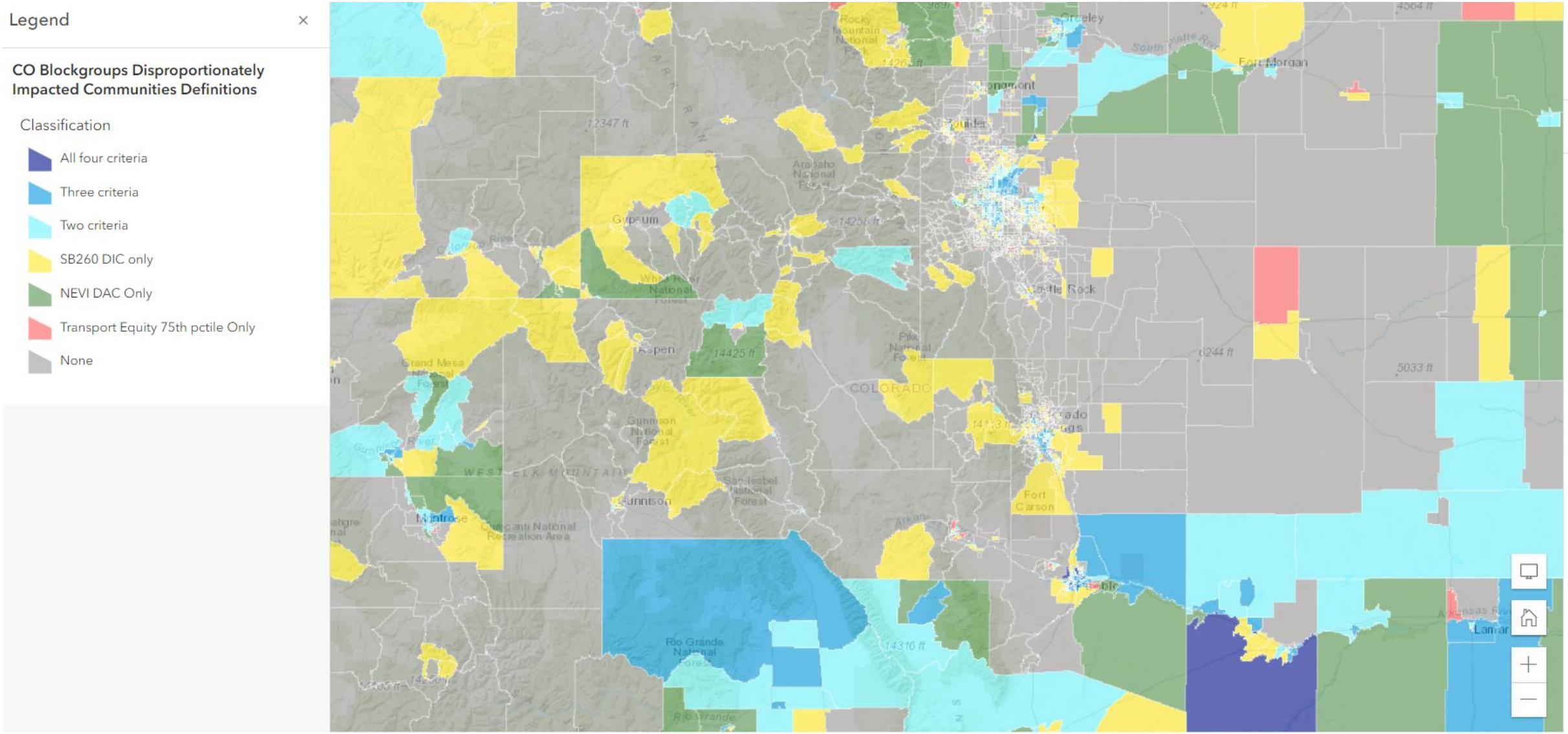
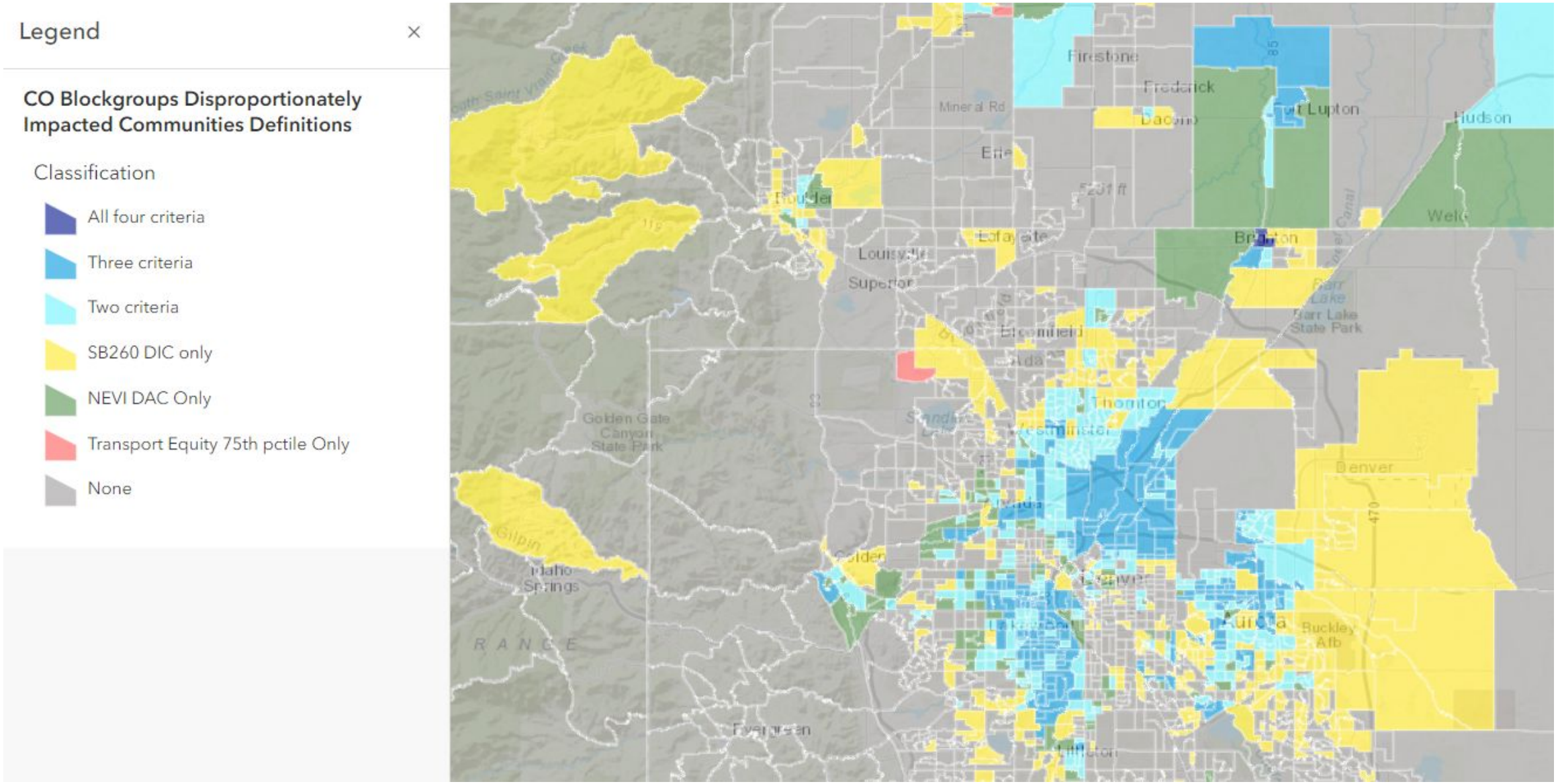
Overview of different equity definitions and tools

Tool/definition name	Agency	Summary	Considerations for use
SB21-260 **disproportionately impacted definition**	Legislature	Disproportionately impacted community (DIC) - census block group where 1. the proportion of households that are low income is greater than 40% 2. the proportion of households that identify as as minority is greater than 40%, or 3. the proportion of households that are housing cost-burdened is greater than 40% Cost-burdened: household that spends more than 30% of its income on housing Low income: median household income less than 200% of FPL	• Defined in statute, must be used in Enterprise-funded community programs at least in some way
CO Enviroscreen	CDPHE	Environmental justice mapping and health screening tool for Colorado that identifies areas with current/past environmental inequities, where DICs have a greater health burden and/or face more environmental risks, and DICs based on the definition in Colorado's Environmental Justice Act (HB21-1266)	• Likely to be used by many CO state grant programs • Scores every block group with a percentile - have to decide what to use as a threshold
Electric Vehicle (EV) Charging Justice40 Map **Disadvantaged Communities (DACs)**	USDOT/ USDOE	Consistent with the Justice40 Interim Guidance, U.S. DOT and U.S. DOE developed a joint interim definition of disadvantaged communities (DACs) for the National Electric Vehicle Infrastructure (NEVI) Formula Program. The definition uses publicly available data sets that capture vulnerable populations, health, transportation access and burden, energy burden, fossil dependence, resilience, and environmental and climate hazards.	• Must be used in NEVI-funded programs, at least in reporting • Tract level, while others are at block group level
EV Equity Prioritization tool and indices	CEO	Includes several different indexes, including an overall "transportation equity" index. Identifies areas with different types of transportation burdens, such as exposure to freight pollution, lack of transit access, etc.	• May capture additional variables beyond Enviroscreen that are more focused on transportation
High Emission Communities	Xcel	A community within an area that is disproportionately affected by vehicle emissions related air quality concerns; also by income inequality.	• Used in some of Xcel's EV programs

Map of different definitions and tools

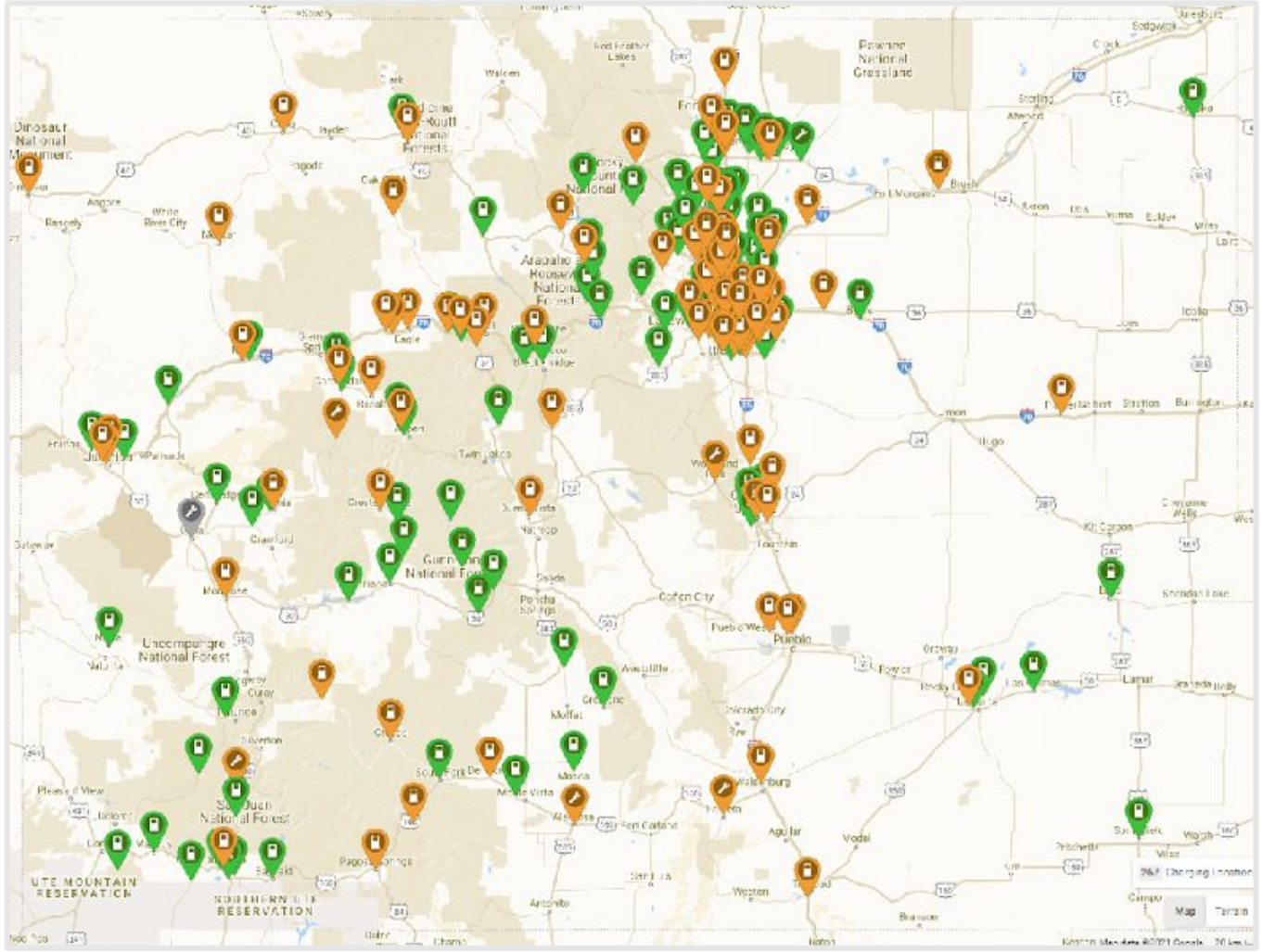


Map of different definitions and tools



Charge Ahead Colorado

- Partnership between CEO and Regional Air Quality Council
  - Solely administered by CEO since March 2022
- Grants for community-based Level 2 and DC fast-charging stations across the state
- Grants for more than 2,000 stations awarded to date



Charge Ahead Colorado

- CEO is prioritizing investments for Disproportionately Impacted and Income Qualified communities through our programs. These programmatic developments have been informed by the Equity study and stakeholder engagement.

- Strategies were reviewed for feedback with various organizations including Energy Outreach Colorado, GRID Alternatives, Western Resource Advocates, Conservation Colorado, City and County of Denver.

- **Strategies include**:
  - Increased funding
  - Reduced match requirements
  - Simplified application process for lower cost projects
  - Preferential scoring during evaluation
    - Highly competitive programs (3 – 4x funding requests to funding resources) ▫ material benefit
  - Additional education and outreach – soliciting for an EV Equity Advisor this Fall
    - Similar structure to our ReCharge Colorado program

Charge Ahead - enhanced incentive eligibility

- **DI Adder** – Disproportionately impacted communities (DI) are identified at the Census Block Group level. Communities meeting the following criteria: (address look up tool)
    - SB21-260 DIC Definition
    - NEVI DAC Definition
    - Enviroscreen DIC (90th percentile +)
    - Transportation Equity Community (75th percentile +)
    - Tribal lands
  - DI Adder restricted to entities serving the community including libraries, community centers, rec centers, non-profits, schools, public entities for the specific use of the public, places of worship, MFU QI eligible organizations.
- **QI Adder** – 66% of the tenants are at 80% AMI or less.
  - Qualify through established programs such as: Housing Choice (Section 8) Vouchers, Low Income Public Housing, HUD Subsidized Project Based Section 8, Low Income Housing Tax Credit, operated by a Housing Authority, etc. Documentation including land use restriction agreement for verification.

Charge Ahead Colorado - Incentive updates

Station	Match	Incentive
L2 – Fleet	80%	$6,000
Level 2 – Dual Port	80%	$9,000
DCFC – Under 100kW	80%	$35,000
DCFC – Over 100kW	80%	$50,000

Station	Match	Incentive	
Level 2 – Fleet	80%	$6,000	
Level 2 – Dual Port	80%	$9,000	
Level 2 – Dual Port	90%	$11,500	QI Eligible
Level 2 – 19 – 25kW	80%	$12,500	
DCFC – Under 100kW	80%	$35,000	
DCFC – Over 100kW	80%	$50,000	
*Adder		$1,000	DI Eligible

Questions/Discussion

Reminders

Upcoming Meetings

- November 2nd (12-2pm) or November 9th (1-3pm)

Topics:

- Continued discussion on project scoring criteria:
  - Decision requested for planning requirements and emission calculations in November
  - Continued discussion on equity scoring and match structure in November (decision in December?)
- Data reporting requirements
- Public accountability dashboard
- Transit agency presentations
- Other topics at the board's pleasure

Clean Transit Enterprise Information

https://www.codot.gov/programs/innovativemobility/cte

Home | Travel | News | Safety | Performance | Business | Programs | Projects | About CDOT | Select Language | Search... | Search | A-Z

COLORADO Department of Transportation

Programs

Home | Programs | Innovative Mobility | Clean Transit Enterprise

Resources

- Clean Transit Enterprise
- Electric Vehicle Ride & Drive Event
- Electrification
- Mobility Services
- Mobility Technology
- Transit and Rail

Clean Transit Enterprise

To support Colorado's transit electrification through planning efforts, transit site upgrades, procurement of electric transit buses, and deployment of associated charging infrastructure.

About the Clean Transit Enterprise

This enterprise is created within the Colorado Department of Transportation (CDOT) to support public transit electrification planning efforts, facility upgrades, fleet motor vehicle replacement, as well as construction and development of electric motor vehicle charging and fueling infrastructure. The bill allows the enterprise to impose a clean transit retail delivery fee to fund its operations, and to issue grants, loans or rebates to support electrification of public transit.

Contact Us

cdot_cleantransitenterprise@state.co.us

Resources

- Board Appointments
- Enterprise Funds
- Board Powers & Duties
- Clean Transit Enterprise 10 Year Plan
- 2021 Transit Zero Emission Vehicle (ZEV) Roadmap
- Clean Transit Enterprise Processes and Fees, 2 CCR 607-1

Upcoming Meetings

Board of Directors Meeting
July 13, 2022
12:00-2:00 pm
YouTube Link
Schedule & Agenda

Prior Meetings

Board of Directors Meeting - January 31st, 2022
Video Recording

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