

# Transportation Electrification Division 87 Rulemaking – AR 654

Welcome to the Kickoff Workshop!  
February 4, 2022



# Operating Agreements

1. Be energy efficient: (Allow room for multiple perspectives. Leave time for everyone.)
2. Stay engaged (connected) without tripping the circuit breaker: (Don't overheat.)
3. Consider environmental conditions: (Mute when not speaking.)
4. Seek understanding: (Listen to understand, not to respond.)
5. Group Norms: (suggestions from participants)



# Who's Who

## Hosts and Presenters (OPUC)

Sarah Hall, Resource & Programs Development Manager  
Ezell Watson, Director of Diversity, Equity and Inclusion  
Eric Shierman, Senior Utility Analyst  
Jill Goatcher, Assistant Attorney General, DOJ

## Guest Presenters

Mary Brazell, Transportation Electrification Program Manager,  
Climate Office, ODOT  
Aradhana Gahlaut, Associate, Rocky Mountain Institute  
Steven Corson, Senior Regulatory Analyst, PGE  
Elizabeth Turnbull, Senior Product Portfolio Manager, PGE  
Annabel Drayton, Policy Associate, Northwest Energy Coalition



# Who's Who

Please introduce yourselves in chat.

Name and any organizational affiliation



# Today's Agenda

1. TE Investment Framework (UM 2165) review
2. ODOT's Transportation Electrification Infrastructure Needs Analysis (TEINA) model
3. Stakeholder ideas about performance areas
4. Approach to rulemaking
5. Docket schedule and next steps for AR 654



# Docket Schedule

Activity and Date	Description
<b>Feb 4, 2022</b>	Public workshop to explore TE Investment Framework for adoption per Commission Order [ ] recommended by Staff and
<b>February 16, 2022</b>	Staff working draft (red-line) of revised Division 87 rules posted to AR 654 docket
<b>March 4</b>	Stakeholder written comments due on working draft of rules
<b>Late March - April</b>	Optional: Technical workshop on TEINA modeling
<b>March 30</b>	Staff Report posted to AR 654. Report will include proposed rules and summary of stakeholder comments
<b>April 5</b>	Public Meeting for Commission action to adopt draft rules and open formal rulemaking phase
<b>April - July</b>	Formal rulemaking phase. Will include rulemaking hearing, public comment period, Special Public Meeting
<b>July 2022</b>	New Division 87 rules effective for TE Plan filings



# UM 2165 – TE Investment Framework and Next Steps

## TE Portfolio Plan and Budget *with broad scope, holistic process*

**Infrastructure Guardrail sets “upper bounds” for utility infrastructure investment**  
*ODOT’s Transportation Electrification Infrastructure Needs Analysis (TEINA)*

Based on State’s EV adoption goals in SB 1044 for light-duty vehicles (LDV)  
 By chargers and/or charging ports for LDV public charging, some medium/heavy-duty use cases

**Portfolio Performance Areas**  
**Direct focus and reporting in key areas**

- Greenhouse gas emission reduction
- EV adoption
- Underserved community inclusion and offerings
- Distribution system impacts and resource benefits
- Program participation
- Charging adequacy
- Infrastructure performance
- Learnings for readiness

**Benefit/Cost Analysis**  
**Applied to portfolios to improve transparency, inform decision-making**

Non-binding costs tests - TRC, UCT, PCT  
 2022 – 2024

Jurisdiction-Specific Test developed for binding approval (2025 – onward)

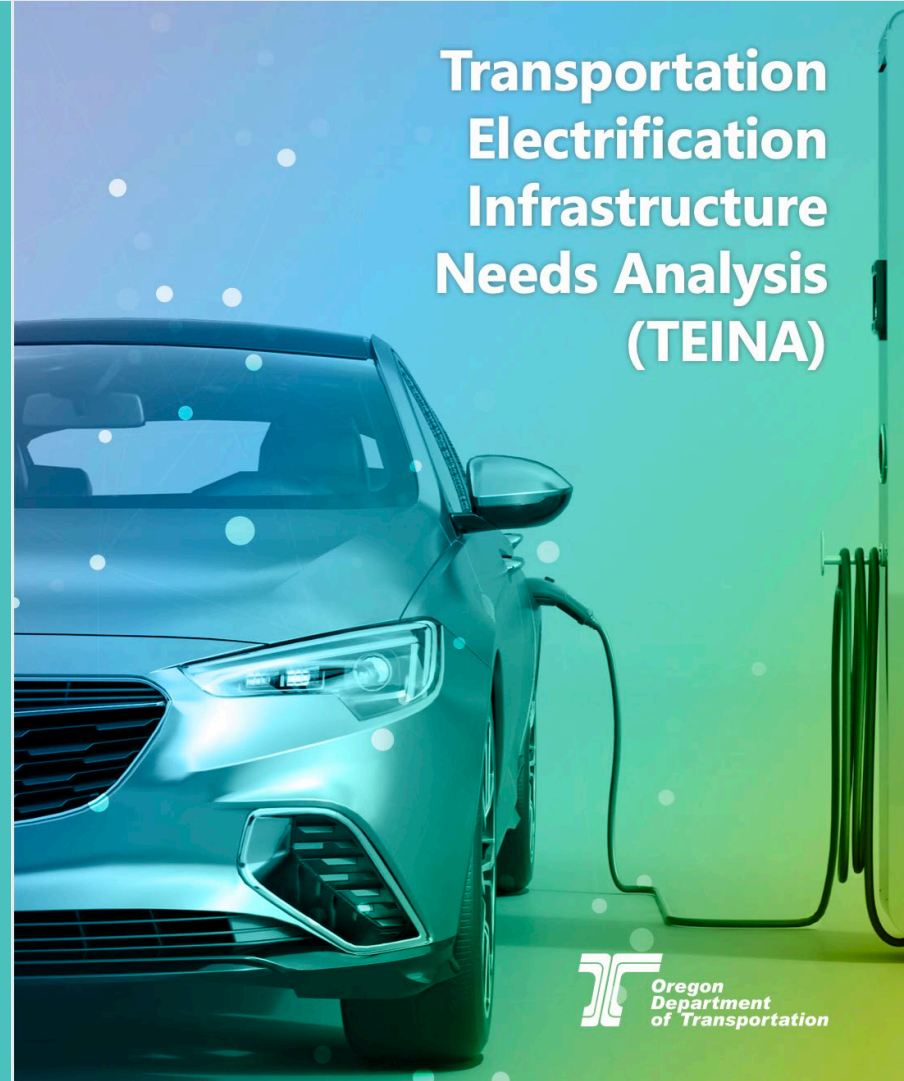
# DRIVING TRANSPORTATION ELECTRIFICATION FORWARD – THE TEINA STUDY

February 4, 2022

Oregon Public Utility Commission  
Transportation Electrification Investment Framework  
Docket No. AR 654  
Public Workshop

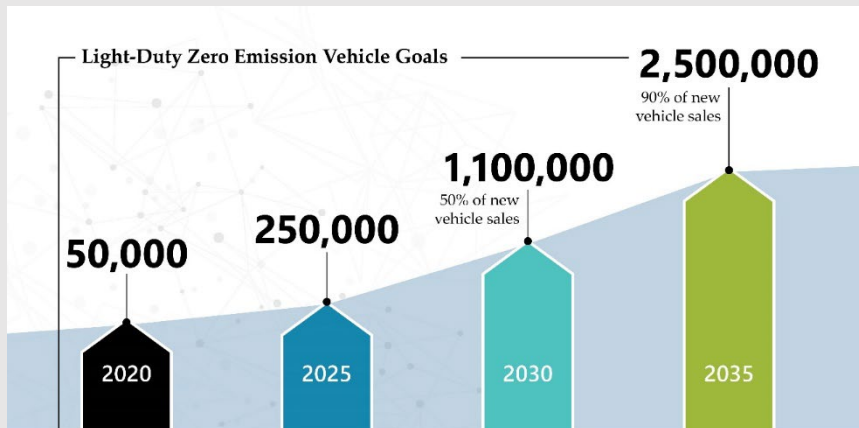
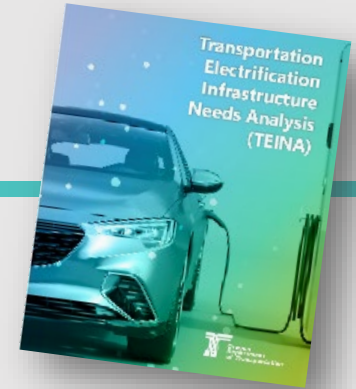


## Transportation Electrification Infrastructure Needs Analysis (TEINA)





# TEINA Study Approach



## Study Objectives

Charging Infrastructure needs & actions

Focus on light duty vehicles

Overview of medium, heavy duty, micro-mobility

Rural and underserved communities

## 9 Use Cases

1. Urban LDV
2. Rural LDV
3. Corridor
4. Commercial Delivery
5. Long-Haul Trucking
6. TNCs
7. Transit and School Buses
8. Micro-Mobility
9. Disadvantaged Communities

# Where the EVs and Chargers are in OR

Total number of public ports: 2,300




Level 2 chargers: 75%

DCFCs: 23%

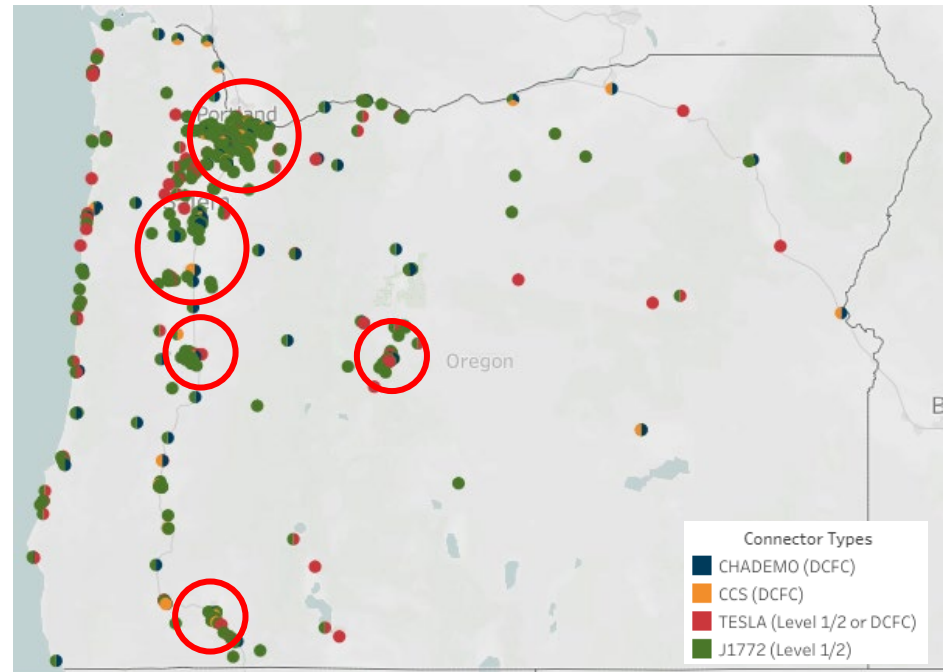
Concentrated in urban areas

Distributed along the corridors and coast

## Charging suitability

DC Standard	Connector	Used By
SAE Combined Charging System (CCS)		<ul style="list-style-type: none"> <li>• GM</li> <li>• Ford</li> <li>• Honda</li> <li>• Kia</li> <li>• Hyundai</li> <li>• BMW</li> <li>• Mercedes</li> <li>• Porsche</li> <li>• Audi</li> <li>• VW</li> </ul>
CHAdeMO		<ul style="list-style-type: none"> <li>• Nissan</li> <li>• Mitsubishi</li> </ul>
Tesla Supercharger		<ul style="list-style-type: none"> <li>• Tesla</li> </ul>

## Where are Existing Chargers Located?



Displayed information is for the period through July 31, 2020

Source: Oregon Department of Energy (<https://www.oregon.gov/energy/Data-and-Reports/Pages/Oregon-Electric-Vehicle-Dashboard.aspx>); PGE (PGE's 2019 Transportation Electrification Plan)

# Common Themes from Listening Sessions

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Upfront costs  
for both  
vehicles and  
charging  
infrastructure

Charging at  
Multi-Unit  
Dwellings  
(MUDs)

Statewide  
Public  
Charging  
Network

Public  
Charging User  
Experience

Availability of  
Vehicles and  
Equipment

# TEINA Modeling Results for All Nine Use Cases

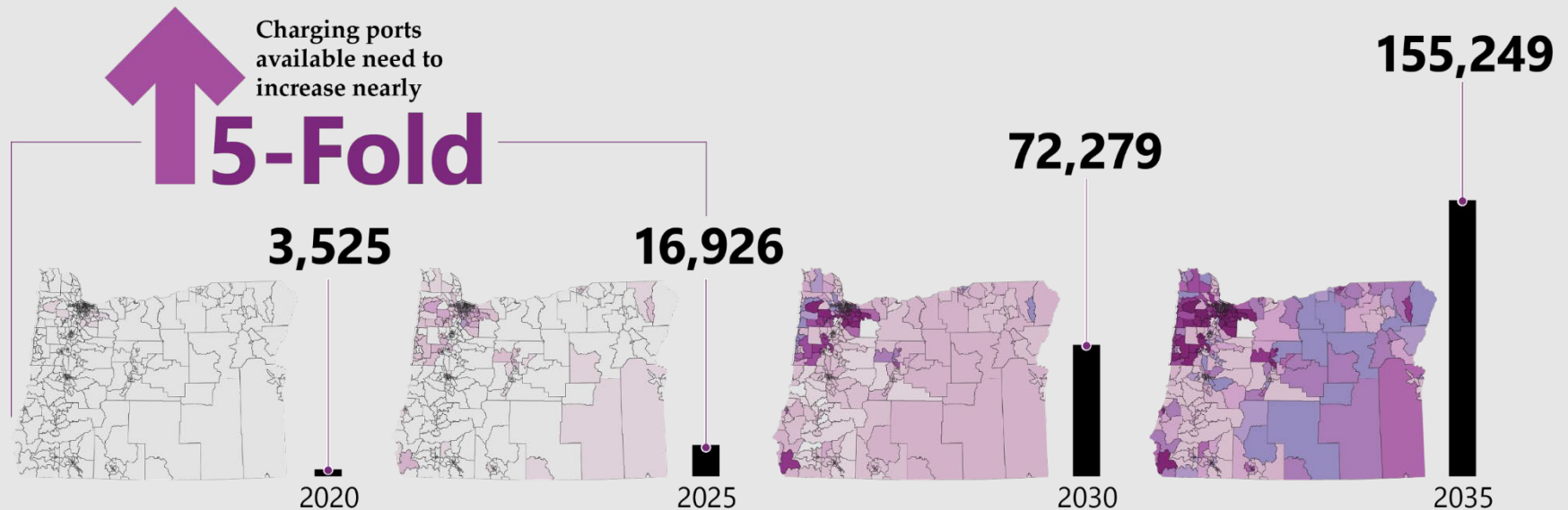
## Light Duty Vehicle Highlight

**Growth in public charging ports needed over the next 15 years to meet Oregon's 2035 goal.**

Note: Modeling assumes 50,000 electric vehicles in 2020.

Light-Duty Vehicle Charging Ports Needed by Type of Charging Port (Business as Usual Scenario)			
	2025	2030	2035
Workplace Level 2	7,022	32,405	70,429
Public Level 2	4,472	20,611	44,785
Public Direct Current Fast Charge (DCFC)	4,411	14,875	29,639

Note: LDV includes the Urban, Rural, Corridor, TNC, and Disadvantaged Communities Use Cases



# TEINA Modeling Results for All Nine Use Cases

Number of Charging Ports Needed by Use Case (Business as Usual Scenario)

	2020	2025	2030	2035
Urban Light-Duty Vehicles (LDVs)	2,000	8,000	39,000	84,000
Rural LDVs	1,000	5,000	22,000	49,000
Corridor LDVs	400	2,000	3,900	6,100
Local Commercial and Industrial Vehicles	10	371	949	1,836
Transit and School Buses	15	893	3,318	7,407
Transportation Network Companies (TNC)	0	23	193	216
Long-Haul Trucking	0	39	219	690
Disadvantaged Communities	100	600	2,700	6,000
<b>Total Number of Charging Ports</b>	<b>3,525</b>	<b>16,926</b>	<b>72,279</b>	<b>155,249</b>
<b>Increase Over 2020 Level</b>		<b>480%</b>	<b>2,050%</b>	<b>4,404%</b>

Note: Modeling assumes 50,000 electric vehicles in 2020. Projections reflect optimized Business as Usual results.

# Oregon's Overall Infrastructure Goals

To provide Oregonians with confidence that EV charging will be as ubiquitous and convenient as fueling with gasoline.



1

Rapid Deployment of Electric Vehicle Charging Infrastructure



2

Equitable and Accessible Infrastructure



3

User-Friendly, Convenient, Safe and Consistent Charging Experience



4

Lower Electric Fueling Costs for Consumers and Fleets



5

Utility Engagement in Electric Vehicle Charging Statewide



6

Foundational Policies and Resources

# Key Take-Aways

- There are Rural and Urban Charging Deserts
  - Equity needs to be a top consideration, with a focus on BIPOC and Low-Income
  - There is some private sector hesitancy, so public sector investment is needed
  - Infrastructure precedes EVs
  - Home charging is key overall; and public charging is critical to mainstream EVs
- **It Takes a Village (especially Utilities)**



# Next Steps

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- **ZEV Charging Infrastructure Deployment Strategy**
  - Phased implementation plan 2022 – 2025; 2026 - 2028
  - Stakeholder Engagement including interactive Open House map
  - Annual estimates for LDV, some Med/HD and Excel and mapping tools
  - Cost estimates, siting factors, prototypes for charging stations, specs
- **Secure Funding and Make Equitable Investments**
  - ODOT Community EV Charging Grants
  - Federal Infrastructure Bill opportunities
- **Coordination with Utilities, State Agencies, and Other Stakeholders, and Lead by Example**
- **Supplemental Analyses:**
  - Hydrogen refueling infrastructure
  - Opportunities for electric micro-mobility (eScooters and eBikes)







**CONNECT WITH**



**Mary Brazell**

Transportation Electrification Program Manager  
Climate Office

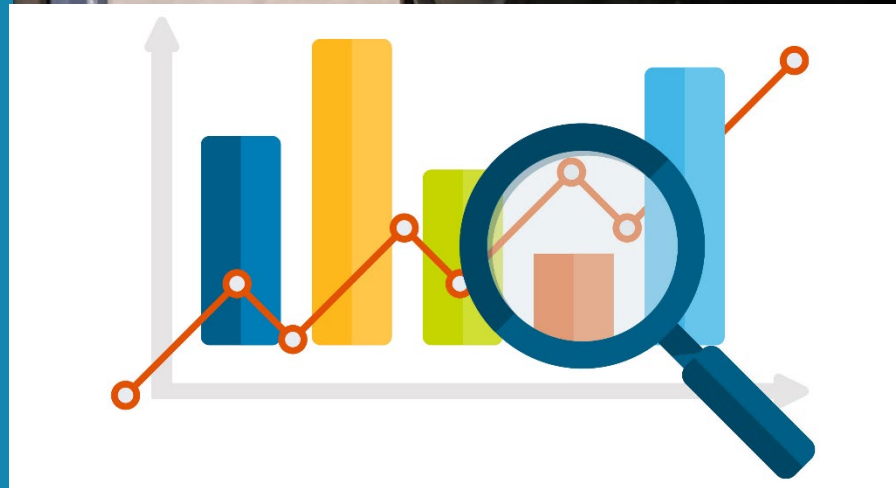
Oregon Department of Transportation

Mary.Brazell@odot.state.or.us

<https://www.oregon.gov/odot/Programs/Pages/Climate-Office.aspx>

<https://www.oregon.gov/odot/Programs/Pages/TEINA.aspx>

# TEINA STUDY: MODELING OVERVIEW OREGON STATE



# TEINA Analysis: OR EV Targets

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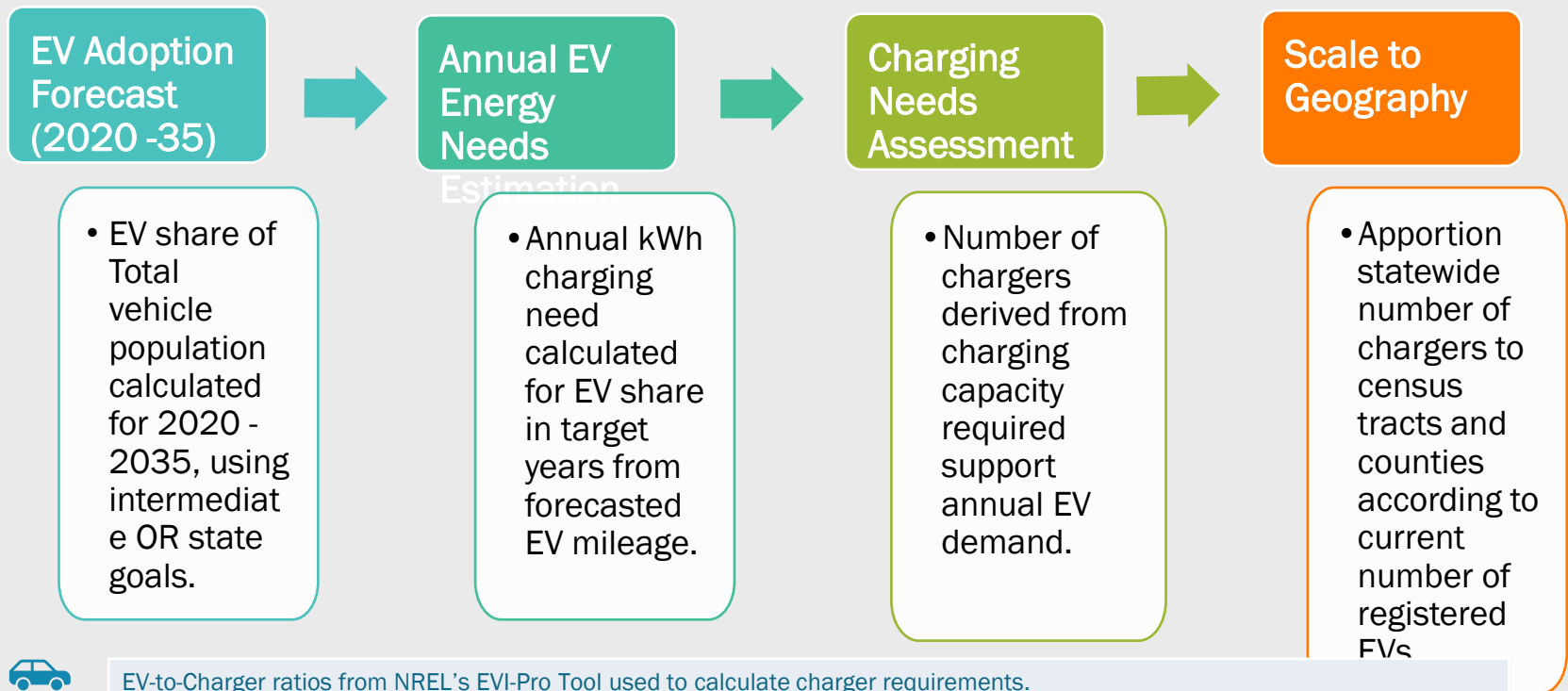


**50% of Oregon's  
statewide Light-Duty  
Vehicles  
by 2035**



- + Urban and Rural Light-duty Vehicles (LDVs)
- + Medium- and Heavy-duty Vehicles (MDVs/HDVs)
- + Transit and School Buses

# TEINA Model Overview



EV-to-Charger ratios from NREL's EVI-Pro Tool used to calculate charger requirements.



Total annual Vehicle Miles Traveled (VMT) used as input to account for varied mileage per truck.



Bus-to-Charger ratios applied according to current and projected market conditions.

# Vehicle Modes & Use-Cases

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- Vehicle Modes
  - Urban Light duty vehicles
  - Rural Light duty vehicles
  - Local Medium-duty Trucks
  - Long Haul Heavy-duty Trucks
  - Transit and School Buses
- Focused Use-Cases (light-duty)
  - Highway corridors
  - Disadvantaged communities
  - TNCs
  - Micromobility

Highlighted Modes and Use Cases to be included  
in the upcoming Modeling User-Interface

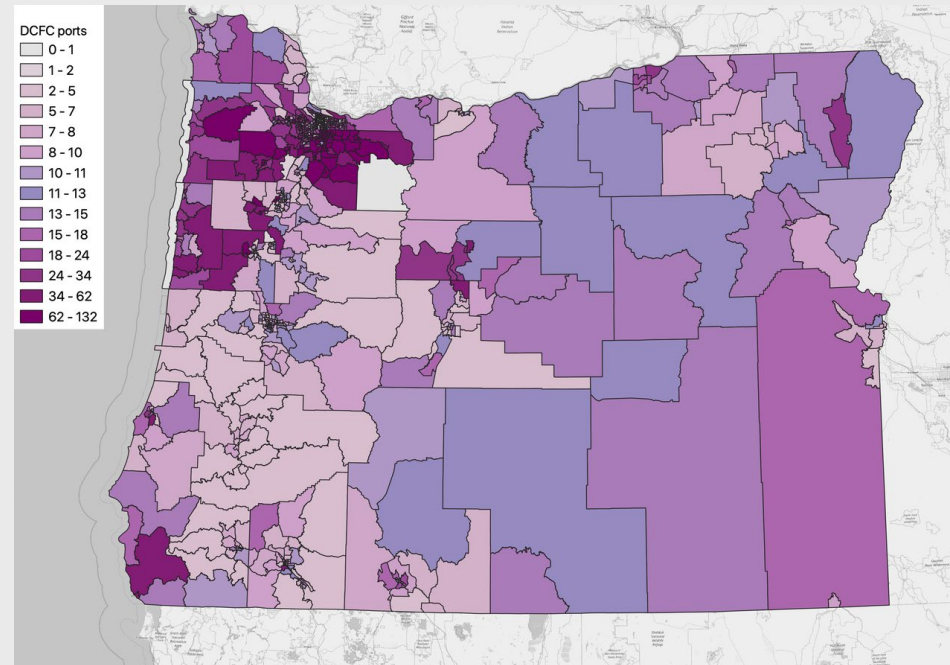
# Next Steps: Modeling User-Interface

- TEINA study Excel model to be translated into a Modeling User Interface, including support for user-inputs.
- **Key benefit:** Enable users to navigate and modify key variables within the model, creating custom charging scenarios to be compared with TEINA results.



# Next Steps: Interactive Mapping Tool

- Interactive web-based GIS map displaying TEINA charging station results along with data layers of planning importance.
- **Key benefit:** Overlay number of charging stations required with social, economic, environmental, and infrastructure data layers, to inform siting decisions within particular geographies.



# Key Modeling Assumptions

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- **Urban and Rural LDVs**
  - Urban-to-Rural vehicle ratio constant at 4.3
  - 90% of all LDV charging is at home in 2020, decreasing to 60% in 2035 as more workplace and public charging ports are installed; DCFC power = 150kW
- **Corridor LDVs**
  - LDV constitute 68% of traffic on all major corridors in the state (\*AADT);
  - Corridors included:
- **Local Commercial MDVs**
  - 90% enroute charging in 2035, from 10% in 2020; DCFC power = 350 kW
  - 21% MDVs electric by 2035.
- **Long-Haul Trucking**
  - eTruck sales grow to 15% in 2035
  - 50% enroute charging in 2035, from 10% in 2020. DCFC power = 500 kW
  - 1/3 VMT from out of state trucks.
- **Transit and School Buses**
  - E-bus market share reaches 75% by 2035 and 90% of new sales; 60kW depot charging.
  - 1:1 charging port per Bus to 2:1 after 2030.
  - DCFC for transit buses and L2 for school buses.

\*Annual Average Daily Traffic



For more information, please  
contact:

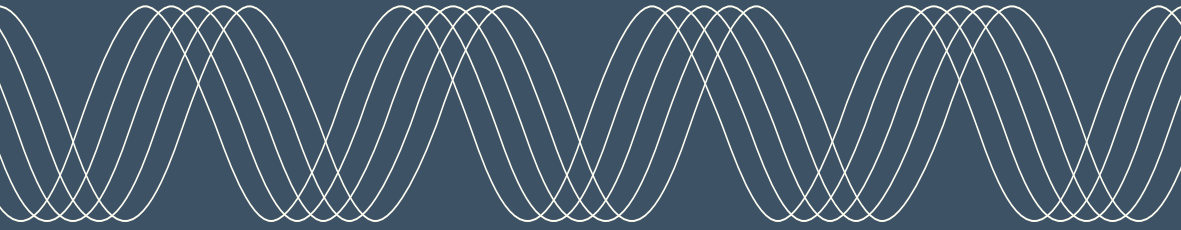
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# TE Investment Framework: Metrics

February 4, 2022



# Use of Metrics

When proposed as part of a portfolio of transportation electrification infrastructure measures and programs, metrics can be used to *evaluate the portfolio holistically*.

Metrics are intended to:

- Help measure progress;
- Identify program designs that are more and less effective / efficient; and
- Provide clarity for utilities, stakeholders, and the OPUC about evaluation of a TE portfolio.

PGE envisions that in each TE plan, the utility proposes appropriate targets for the evaluation of the portfolio of activities described by that TE plan.



# Proposed Types of Metrics

## Performance Metrics

- Measures of direct outputs of utility activities
  - Metric is mature enough to enable target-setting
  - Can be used in reporting and assessment of portfolio success or sufficiency
  - Utility forecasts metric performance for the proposed TE portfolio as part of the TE plan, then reports on progress
  - Assessed at a TE portfolio level
- Examples:**
- Number of ports installed through utility programs
  - MW of flexible load available through programs

*Related to programmatic activity and used in evaluation of TE portfolio*

## Baselining Metrics

- Measures of outputs of utility activities
  - Metric is not yet mature enough to enable target-setting, or measures progress over a long time-horizon
  - May be turned into a performance metric at some future point
  - Not used in assessing portfolio success or sufficiency
  - Utilities does not forecast metric performance, but does report on progress
- Examples:**
- Percentage of utility program-enabled charging load that occurs off-peak

*Related to programmatic activity, but not used in evaluation*

## Tracking Metrics

- Not used in evaluating the TE portfolio because utility programs and investment are not able to significantly influence that variable, or measurement is impractical
  - Utility reports metric as part of TE plan
  - Assessed at a state/service area level
- Examples:**
- Number of LDV EVs in utility's service area
  - Distribution of public charging ports by census tract

*Included to track a key issue, but not used in evaluation*



# Potential Metrics Categories



Program Participation and Adoption



Grid Benefit



Charging Adequacy



Environmental Benefits



Equity



Outreach and Engagement

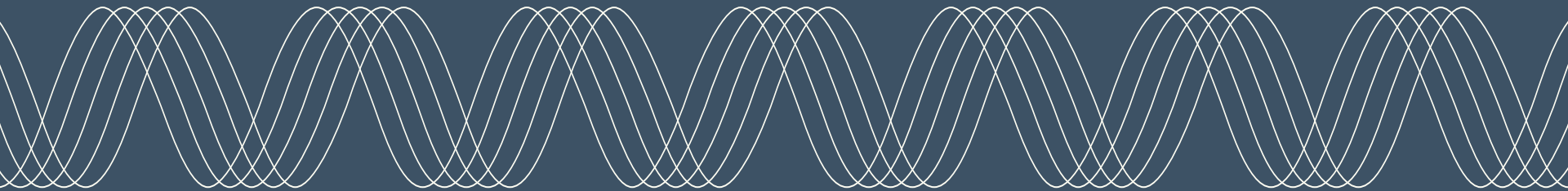


Infrastructure Performance



Learnings for Readiness

# Questions/Discussion



# AR 654 Public Workshop: Transportation Electrification Metrics

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Annabel Drayton, Policy Associate

NW Energy Coalition

February 4, 2022

# Good afternoon!

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- NWECC's initial ideas on metrics, informed by conversations with stakeholders and advocates as well as TE resources and dockets from other states.
- Hope this sparks continued discussion, but don't expect these to be the final word.



# TE Portfolio Metrics and Targets

- Rather than a single “measure” or program offering, a **portfolio** of programs includes multiple programs that are designed, evaluated, and implemented together.
- A **metric** is a quantitative measure that is useful in assessing utility progress toward a desired goal or outcome.
- While metrics can be tracked throughout the implementation of the portfolio and reported on periodically, **targets** can be set to indicate how the utility intends for the portfolio to perform.



## Equitable TE Portfolio Outcomes

**Desired TE Portfolio Goal\*:** Increased electrification (EVSE installed) of medium- and heavy-duty fleets and last-mile delivery fleets that serve or operate in environmental justice communities

**Metric:** Percent of utility-owned and supported EVSE by use case [located] within environmental justice communities

**Target :** [50]% of utility-owned and supported EVSE by use case are [located] within environmental justice communities

*\*One of eleven desired TE portfolio outcomes identified in joint comments from Climate Solutions, Forth, Green Energy Institute at Lewis & Clark Law School, NW Energy Coalition, and Verde; July 14, 2021*

# Potential TE Metrics

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## Environmental/Public Health:

- GHG emission and air pollution reductions attributed to all EVs in a utility service area

## Infrastructure:

- Number of utility-owned and supported EVSE by use case
- Percent of total EVSE by use case within utility service territory that are utility-owned and supported

## Equity:

- Percent of utility-owned and supported EVSE by use case [located] within environmental justice communities
- Reduction in vulnerable customers' transportation energy burden
- Annual service hours, number of routes, and number of routes serving environmental justice communities of the transit agencies the utility helps electrify
- Types of electric transportation technology supported by a utility portfolio as a percent of total investments

# Potential TE Metrics

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## Affordability/Financial:

- Price to charge at utility-owned and supported EVSE by use case
- Costs and benefits by customer class

## Grid Benefits:

- Percent of load shifted to off-peak periods attributable to TE tariff offerings by use case

## Reliability:

- Uptime at utility-owned and supported EVSE by use case

## Engagement:

- Outreach, capacity building to and participation of environmental justice communities, low-income service providers, community-based and community service organizations, non-profit organizations, small businesses (particularly minority and women owned businesses), and tribes in the development and implementation of a utility TE portfolio

# Approach to Division 87 Rulemaking

- Future-proofing rules
- Clarity and flexibility
- Collaboration
- Respecting stakeholder comments to date



## Discussion Topics

- Stakeholder engagement in consolidated planning process
- Managing changes to TE programs and Plan Budget
- TEINA
- Performance areas
- Benefit-cost analysis



# Planning Questions

- How do we consolidate TE planning to maximize stakeholders' available time to participate in decision-making review?
- What is enough engagement with utilities for the public review of a TE Plan and TE Budget?



# Planning Questions

- Should utilities include all program applications in TE Plans rather than through advice filings?
- Should there be a new infrastructure measure application section?
- Between TE Plan filings, what process should be available to utilities for material changes to TE programs, Plans, and Budgets?
- What changes are material?





# Investment Framework Questions

- Do you have thoughts on how the TEINA model should be referenced as an “upper bound” for utility infrastructure investments?
- Performance areas: How much detail should be specified? (specific metrics for tracking and reporting)
- Which benefit/cost analysis (BCA) “cost tests” should the rules require? At both program and portfolio levels?



# Investment Framework Questions

- Do you have other thoughts on how the investment framework should be incorporated in the administrative rules?



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# Submitting Public Comments on Draft Rules

- By email – [PUC.FilingCenter@puc.oregon.gov](mailto:PUC.FilingCenter@puc.oregon.gov) Include “COMMENTS – DOCKET NO. AR 654” in subject line
- By Mail – Oregon Public Utility Commission, Attn: AR 654 Public Comment, PO Box 1088, Salem, OR 97308-1088
- By Phone – 503-378-6600 or 800-522-2404 or TTY 800-648-3458, weekdays from 8 a.m. - 5 p.m. Pacific Time



# Thank You!

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