

# Welcome to the TEINA Advisory Group Meeting #2

To maximize our time together, we will utilize the meeting procedures below.



To improve audio quality, please use headphones or change your audio connection from your computer to your phone, using "Switch Audio."



At the beginning of each session, please type your name in the chat box to "sign-in" to the meeting.



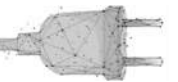
Meetings will be recorded for note taking purposes.



Mute phones when not speaking to help reduce excess background noise.



During conversations, please feel free to use the chat box to ask questions and provide comments in addition to verbal comments.



# TEINA Existing Conditions Assessment and Literature Review





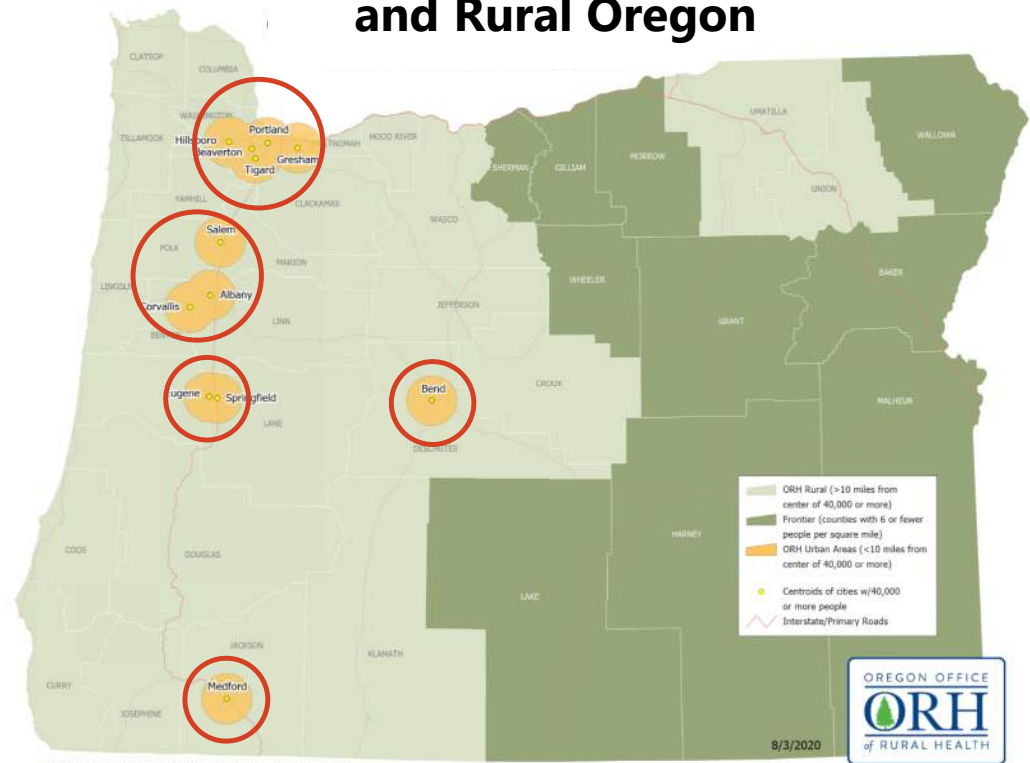
# Existing Conditions in Oregon and Literature Review by Use-Case

# Where the EVs and Chargers are in OR

Urban Populations  
**~2.8M** (65%)  
Concentrated in  
5 Red Circles

Rural Populations  
**~1.5M** (35%)  
Concentrated in  
Dark & Light  
Green Areas

A Map Defining Urban and Rural Oregon

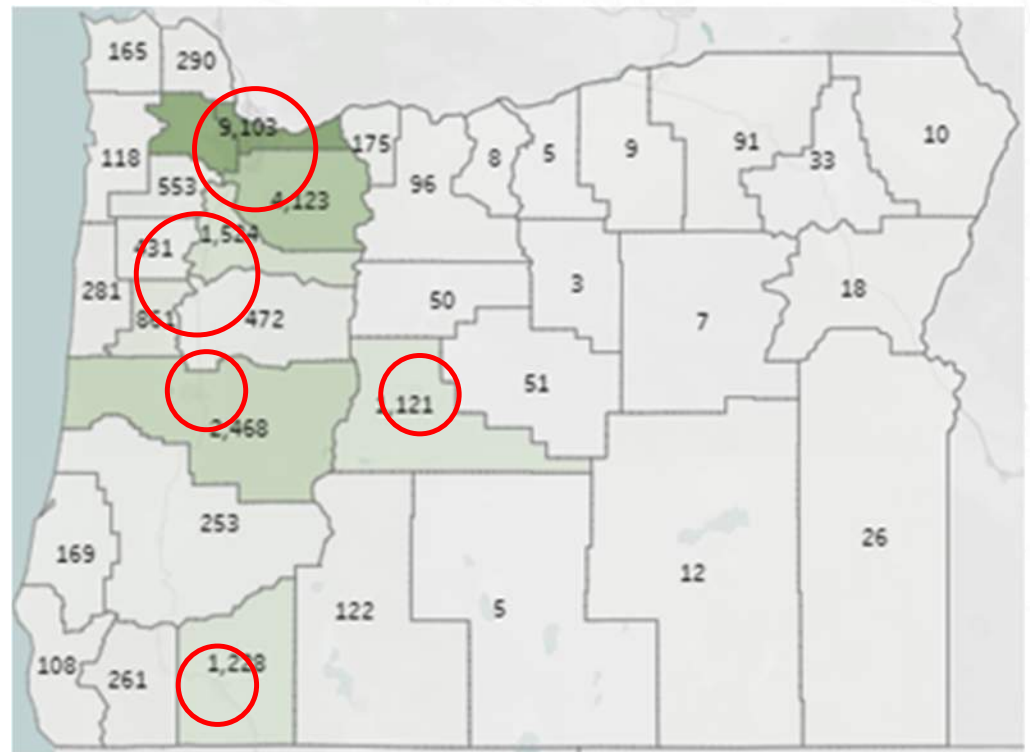


Source: Oregon Office of Rural Health (<https://www.ohsu.edu/oregon-office-of-rural-health/about-rural-and-frontier-data>)

# Where the EVs and Chargers are in OR

- **Total number of ZEVs: 32,000**
  - BEVs: 67%
  - PHEVs: 33%
  - Concentrated in urban areas
- **Statewide LDVs (EV and ICE): ~3.2 M**
  - Currently 1% electrification level
- **Electrification Goals (SB 1044)**
  - 2020: 1.15% (50,000 ZEVs)
  - 2025: 8% (250,000 ZEVs)
  - 2030: 25% (800,000 ZEVs)

## Where are ZEVs Registered?






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>)

# Where the EVs and Chargers are in OR

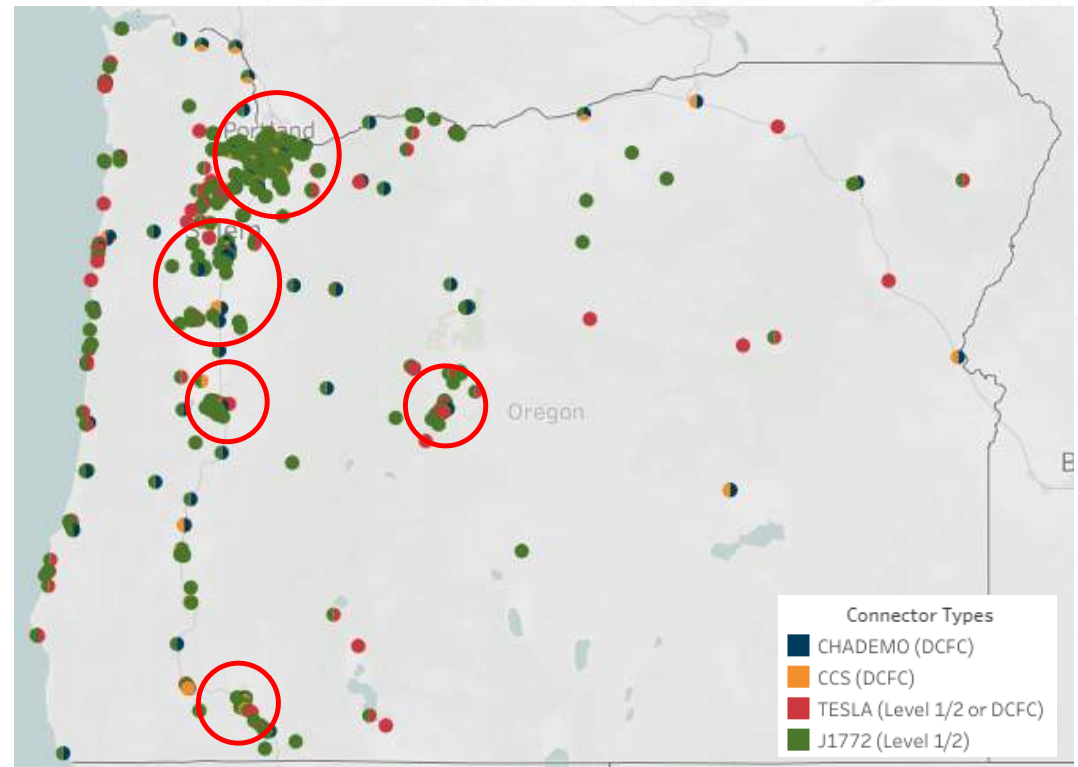
- **Total number of public ports: 2,300**
  - Level 2 chargers: 75%
  - DCFCs: 23%
  - Concentrated in urban areas
  - Distributed along the corridors and coast
- **Charging suitability**

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>

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)

## Where are Existing Chargers Located?



# Where EVs are Nationally

- **Zero Emission Vehicle (ZEV) Standard**

- 12 states have adopted California's ZEV standard: CA, CO, CT, ME, MD, MA, NY, NY, **OR**, RI, WA and VT.
- MN, NV, and NM also are considering the ZEV standard.

- **A ZEV standard attracts EV models to the state.**

Most automakers have many models of EVs that they only sell in ZEV states. **Public chargers get built where the EVs are.**

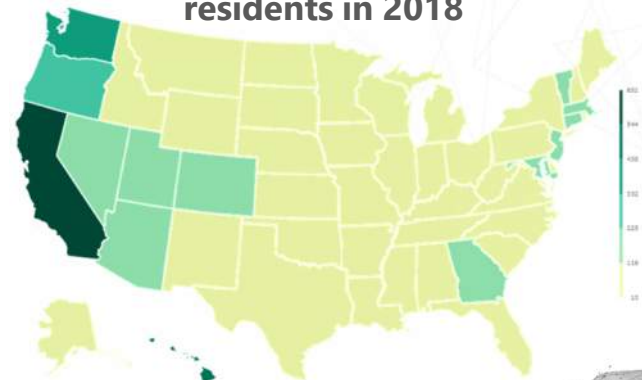
- Market share of EVs sold in the U.S.:

- **BEVs: 56%**
- PHEVs: 44%
- Hydrogen FCV: 0.5%

States that have adopted CA's emission standards (LEV + ZEV)



EV registrations per 100k residents in 2018



# Where Chargers are Nationally

There are currently about **106,009** charging ports nationwide:

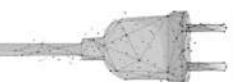
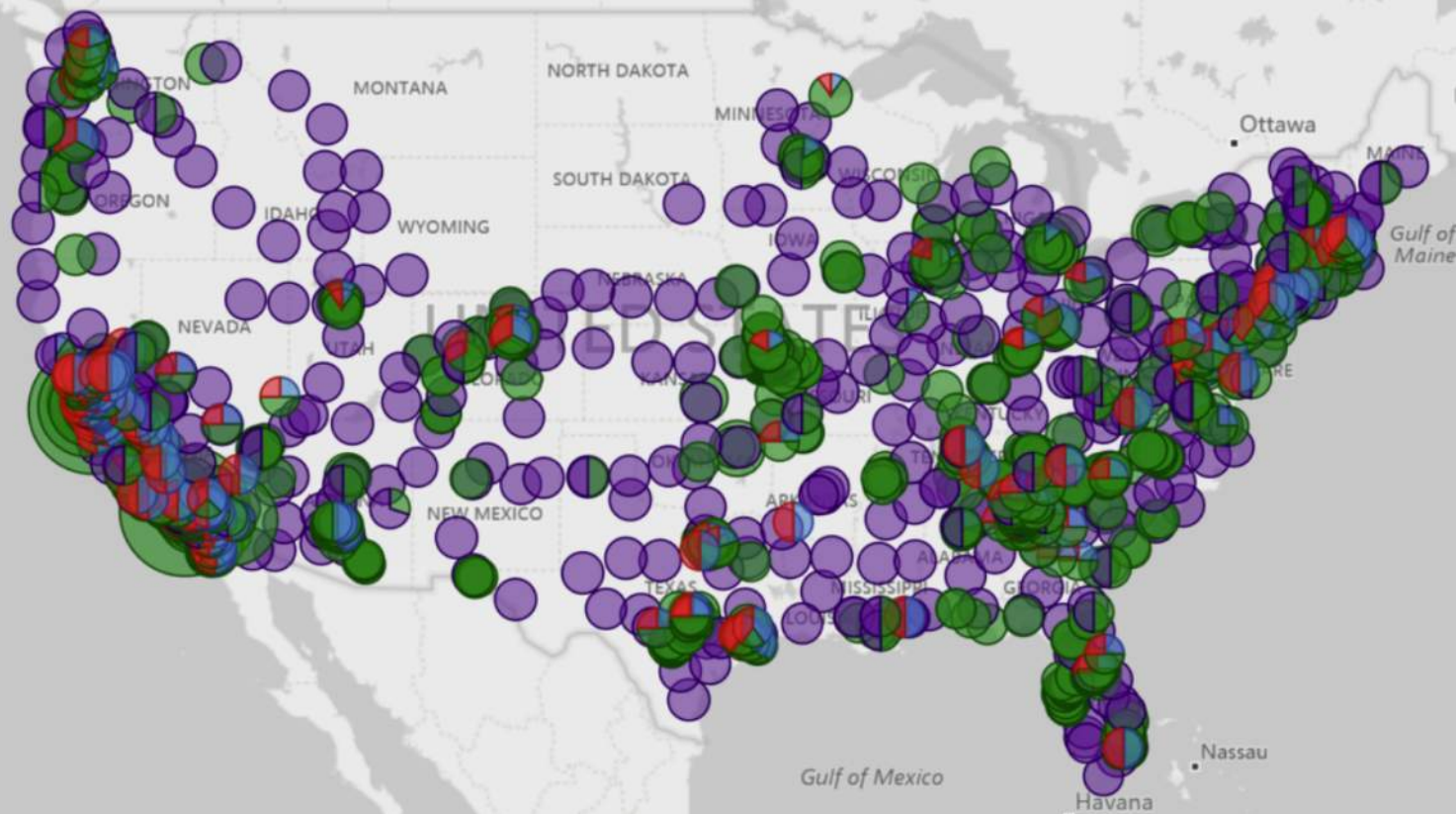
86,576 Level 2 ports (82%)

19,398 DCFC ports, including:

- 4,434 CHAdeMO (4%)
- 5,710 CCS Combo (5%)
- 9,289 Tesla (9%)

#### Connector Types

- Level 2
- CHAdeMO
- CCS
- Tesla





# What Does It Mean to Oregon Statewide

## Key Takeaway(s)

- Oregon is among the **leading states** in ZEV standard adoption and EV registrations
- Oregon has made good progress, but is **not on pace** to meet **ZEV adoption goals** (SB1044)
- ZEVs and chargers are concentrated in urban areas; lower concentrations in **rural areas**
- DCFC makes up 23% of all chargers in Oregon (18% nationally); but **key charging gaps remain**, e.g. SAE/CCS along the West Coast Electric Highway (WCEH), long distances between stations, broad L2 accessibility challenges.

**What have we missed?**



# Use Case: Urban Electric LDVs (Light Duty Vehicles)

## Current Conditions

- Urban Population: **2.8 million**
- Electric LDVs: **26,000** (83% of total)
- Chargers: **600 Stations**
  - Level 2 ports: 1,200
  - DCFC ports: 300
- People per electric LDV: **100/e-LDV** (~1% fleet penetration)
- People per charger:
  - Level 2: **2,000** people/port
  - DCFC: **9,000** people/port
- Electric LDVs per charger:
  - Level 2: **20** electric LDVs/port
  - DCFC: **90** electric LDVs/port

## Planned Additions

- Representative Key player: PGE
  - Large **Urban** Service Area
  - Serves **2/3** of the State Population
  - Over **60%** of current ZEVs are registered in PGE service area
- PGE's Electric Avenue Pilot:
  - Upgrade existing stations
  - **6** New Sites
  - Level 2 ports: **12**
  - DCFC ports: **40**
- Electrify America:
  - **1** Station in Portland
  - **1** Station in Bend

## National Policies & Conditions (Urban & Rural)

- U.S. Population: **331 million**
- All LDVs: **251 million**
- Electric LDVs (BEVs and PHEVs): **1.0 million** registrations (**0.4%** of all LDVs)  
**1.6 million** sales since 2011 (**0.7%** of all LDVs)
- Level 2 ports: **86,576**
- DCFC ports: **19,398**
- People per EV: **325**
- People per Level 2 port: **3,823**
- People per DCFC port: **17,033**
- EVs per Level 2 port: **12**
- EVs per DCFC port: **52**

Note: Numbers are rounded properly for simplicity in presentation

\* The terminology "plug" is equivalent to "port". The discrepancy comes from different data source

2020

By 2022



# Urban Electric LDV Implications

## What does it mean for OREGON?

- Across many metrics, Oregon urban electric LDVs exceed national pace, but **lagging on Electric LDVs per charger**
- Urban electric LDVs have been and will be a major driver to higher electrification goals
- By 2025, about **8** times more ZEVs than today will be on the road
- Charging infrastructure additions need to be **accelerated** to support the rapidly growing ZEVs: single-family home, MUD, workplace, public L2 and DCFC (community DCFC, mobility hubs, other)

**What have we missed?**



# Use Case: Rural Electric LDVs (Light Duty Vehicles)

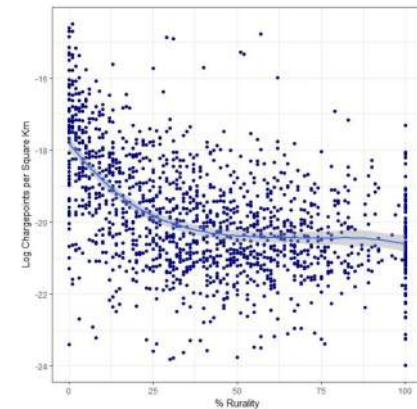
## Current Conditions

- Rural Population: **1.5M**
- Electric LDVs Amount: **5,500** (17% of total)
- Chargers: **300 Stations**
  - Level 2: 500
  - DCFC: 200
- People per electric LDV : **300/e-LDV** (~0.3% fleet penetration)
- People per charger:
  - Level 2: **3,000** people/plug
  - DCFC: **9,000** people/plug
- Electric LDVs per charger:
  - Level 2: **10** electric LDVs/plug
  - DCFC: **30** electric LDVs/plug

## Planned Additions

- Representative Key player:
  - Pacific Power
    - Large **Rural** Service Area
    - **88%** of Pacific Power chargers are in nonmetropolitan areas
    - Over **20%** of current EVs are registered at its service area
- Pacific Power's Plan:
  - **5** New Sites
  - Level 2 Chargers: NA
  - DCFC Chargers: NA
- Electrify America:
  - **1** Station in Newport
  - **1** Station in Warrenton

## National Policies & Conditions



The more rural the location, the fewer chargers it has.

Note: Numbers are rounded properly for simplicity in presentation

2020

By 2022

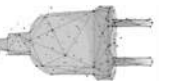
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# Rural Electric LDV Implications

## What does it mean for OREGON?

- Rural Oregon has a relatively low ZEV adoption rate
- Large and dispersed rural areas pose challenging economics for charging stations; plans must consider residential, workplace, public L2 and DCFC (including the need to cover longer travel distances)

**What have we missed?**



# Use Case: Corridor LDVs (Light Duty Vehicles)

## Current Conditions

- West Coast Electric Highway(WCEH)
- Oregon's portion of the WCEH has **44** electric vehicle charging locations along I-5, parts of I-84, US Highway 101, etc.
  - Each station consists of **1** Level 2 charger and **1** DCFC charger (Sites were initiated in 2012 and only equipped with CHAdeMO DCFCs, prior to the adoption of the CCS DCFC standard)
  - **40%** of sites served by IOUs
  - **60%** of sites served by POUs
- Since its inception, Oregon's WCEH has accomplished:
  - **130,000** charging events
  - **1.3** million KWh of charging
  - **4** million miles of all-electric driving

## Planned Additions

- \$4 million is available to:
  - Replace and upgrade charging equipment to accommodate CCS DCFC standard
  - Enhance each of Oregon's 44 WCEH sites
  - Maintain and operate the network over time



## National Policies & Conditions

### West Coast Electric Highway

A network of charging stations located every 25 to 50 miles along Interstate 5, Hwy 99, and major roadways in BC, WA, **OR**, and CA.

Stations currently have 50 kW CHAdeMO DCFC and 7.2 kW Level 2 chargers, as well as thousands of other Level 2 chargers. Upgrades, such as adding CCS Combo DCFC chargers, are in planning.



### Alt Fuel Corridors (FHWA)

Several corridors in OR and more being proposed; potential for federal funding prioritizing those corridors

*Note: Numbers are rounded properly for simplicity in presentation*

2020

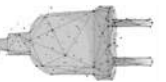
By 2022

# Corridor LDV Implications

## What does it mean for OREGON?

- WCEH is a pioneering landmark serving regional and interstate travel
  - Planned updates will broaden access to include CCS Combo as well as CHAdeMO
- Challenges to foster more rapid electrification in the future
  - Update to meet need for increasing DCFC power levels.
  - Expand existing sites to accommodate more ZEVs at the same time
  - Need for multiple payment mechanisms, open access, inter-operability, and improved reliability

**What have we missed?**



# Use Case: Disadvantaged Communities

## Current Conditions

- Oregon offers Standard and Charge Ahead rebate (income qualified; enables rebate for used EVs)
- PGE and Pacific Power using Clean Fuel Program funds for equity-centered projects
- Many disadvantaged community residents live in MUDs
- Many pilot infrastructure programs are not in disadvantaged communities
- Utilities recognize low-income neighborhoods experience greater barriers to transportation electrification
- Utilities are increasingly aware of disadvantaged communities in the decision-making process

## Planned Additions

- Utilities are building frameworks to promote transportation diversity, equity and inclusion
- PGE's 2021 electric school bus project is addressing underserved communities
- Pacific Power is developing fast charging stations in **5** underserved areas

## National Policies & Conditions

Ensuring that disadvantaged communities have equitable access to clean, electrified transportation is a key objective of most state and municipal programs.

### California programs

In 2019, the California PUC directed its major IOUs to build charging infrastructure in disadvantaged communities, including:

- SDG&E will spend at least 30% of its \$107 million program budget in disadvantaged communities.
- PG&E will fund a program for low-income residents, including \$4 million to provide rebates for charging infrastructure, plus rebates for home EV chargers and home service panel upgrades, and other incentives.
- PG&E, SDG&E, SCE and Liberty Utilities will spend a combined \$55 million to install up to 800 charging ports at parks, beaches and schools, of which 25-100% will be in disadvantaged communities.

*Note: Numbers are rounded properly for simplicity in presentation*

2020

By 2022

16



# Disadvantaged Communities Implications

## What does it mean for OREGON?

- Utilities are running pilots and developing frameworks to address disadvantaged communities
- Funding source is key to serve disadvantaged communities
- Opportunity for policy to address charging equity

**What have we missed?**



# Use Case: Local Commercial and Industrial Vehicles

## Current Conditions

- The development of local commercial and industrial vehicles is still in an early stage
- VW/DERA funds may be used for some MD/HD vehicles, but no specific MD/HD ZEV vehicle purchase incentive (vs. rebates for light-duty vehicles).



## Planned Additions

- **"Electric Island" Project**
  - Co-development: PGE and DTNA (Daimler Trucks North America)
  - A large public charging site for medium- and heavy-duty electric commercial vehicles
  - The site is under construction now near DTNA headquarters in Portland
  - By spring 2021, the project is to support up to **9** vehicle charging stations with charging levels of up to **1** MW

## National Policies & Conditions

### Multi-State ZEV Task Force MHD MOU

As of July 2020, 15 states (including OR) and D.C. have signed onto the joint Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding to develop a multi-state Action Plan to ensure that **30% of all new MD/HD** vehicles sold are zero emission vehicles **by 2030, and 100% by 2050**.

A primary focus is deploying zero-emission MD/HD trucks and buses to benefit disadvantaged communities that have been historically burdened with higher levels of air pollution.

One outcome of the MOU could be to adopt California's **Advanced Clean Trucks (ACT) Rule**, which sets sales requirements for three vehicle class groups. Class 4-8 truck sales would have to be **50% zero-emission by 2030, and 75% by 2035**. (note, Oregon plans to adopt similar ACT regulations).

*Note: Numbers are rounded properly for simplicity in presentation*

2020

By 2022

18

# Local Commercial and Industrial Vehicle Implications

## What does it mean for OREGON?

- Utilities are running pilots in Portland
- Utilities partnering with local companies operating delivery vans and trucks could be a path to explore
- Regulations and/or incentives will be the main drivers to promote these vehicles

**What have we missed?**



# Use Case: Long-Haul Trucking

## Current Conditions

- The development of electric long-haul trucking is still in an early stage
- Truck charging requires greater upgrade and planning due to larger charging capacity
- No MD/HD specific incentives are in place in Oregon



## Planned Additions

- **West Coast Clean Transit Corridor Initiative**
  - Plan and design charging sites for medium and heavy-duty electric trucks along I-5
  - Propose to develop 27 charging sites to support MD electric trucks by 2025. Oregon will operate 8 of them
  - Expand 14 of those sites to accommodate HD electric trucks by 2030

## National Policies & Conditions

### California's Advanced Clean Trucks (ACT) Rule

ACT will require new **Class 7-8 semi truck sales to be 30% zero-emission by 2030, and 40% by 2035**. Forthcoming ACT fleet regulations will apply to trucks entering California from neighboring states, **including Oregon**.

### West Coast Clean Transit Corridor Initiative

The utility-led project is seeking ways to implement an EV trucking/charging corridor along I-5 from CA to WA.

### West Coast Collaborative (WCC)

The WCC's Alt Fuel Infrastructure Corridor Coalition study **proposes** a \$374 mil MD/corridor along the West Coast (141 stations, incl. 62 for EV charging).

### California incentives for Class 8

CEC and CARB will provide up to \$20 million for equipment and infrastructure to support Class 8 ZEV trucks. The goal of this pilot is to support large-scale deployments of 50 or more Class 8 ZEV trucks per fleet and to assess the ability of fleets to recharge or refuel large numbers of trucks daily in regular use.

*Note: Numbers are rounded properly for simplicity in presentation*

2020

By 2022

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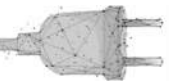


# Long-Haul Trucking Implications

## What does it mean for OREGON?

- MD and HD trucks are more challenging with greater charging capacity requirements and power system upgrades
- The utility-led I-5 West Coast Clean Transit Corridor project is under study
- Potentially partnering with corporations having transportation electrification commitments (Amazon/Walmart/FedEx/etc.,)

**What have we missed?**



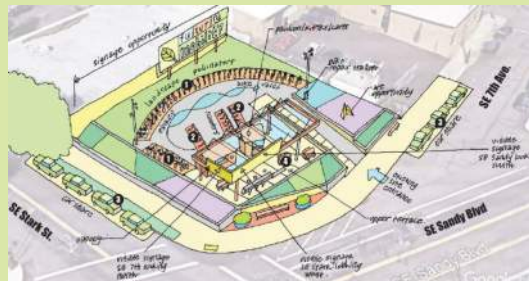
# Use Case: Micro-Mobility

## Current Conditions

- Pacific Power's \$1.3 million Clean Fuels Program grants fund innovative clean transportation projects to fund a range of community-driven electric transportation projects such as purchasing e-bike instant rebates
- Nike Biketown program: 1,500 e-bikes at 180 stations across Portland
- B-line eTrike urban delivery program in Portland

## Planned Additions

- PGE is designing a mobility hub in inner southeast Portland.
- The hub will include active modes of new transportation (e.g. scooters, e-bikes, electric car share)
- The purpose of this project is exploratory and will inform how to engage micro-mobility in the future



## National Policies & Conditions

There do not appear to be any major micromobility charging infrastructure programs nationally, but the global market for micromobility sharing services revenue is expected to grow from \$8 billion in 2020 to \$31 billion by 2030. Shared e-kick scooters (such as Lime and Bird scooters), and seated e-scooters are expected to represent most of the growth opportunities in shared micro-mobility services.

The COVID pandemic caused an initial surge in scooter and bike usage, as many major cities around the world installed new bike- and scooter-friendly lanes. After a mid-year slump for some scooter operators, Bird, Lime and Spin scooters rebounded to roughly year-ago sales levels.

Major cities should plan for rising demand for these services, especially for first/last mile connections to transit. For example, Paris has allocated 2,500 micromobility parking spots for a planned 15,000 e-scooter fleet provided by three operators.

*Note: Numbers are rounded properly for simplicity in presentation*

2020

By 2022

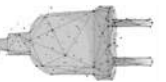
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# Use Case: Micro-Mobility Implications

## What does it mean for OREGON?

- The charging infrastructure dedicated for micro-mobility is unclear; consider e-scooters, e-bikes and e-trikes
- Utilities are running pilots to understand some options for best practices to support charging for micro-mobility

**What have we missed?**



# Use Case: Transit and School Buses

## Current Conditions

### 4 transit agencies are pursuing electrification

- TriMet: TriMet's first electric bus line (Line 62) has been operational since April 2019. This line has **5** battery electric and **2** charging stations: a combination of on-route and depot charging solutions
- South Metro Area Regional Transit (SMART): Since June 2019, **2** e-buses with depot chargers have been in service
- Josephine Community Transit: Since November 2019, **2** e-buses with depot inductive chargers have been in service

## Planned Additions

- Lane Transit District: 11 e-buses will be operating in 2021 with multiple depot chargers
- In 2021, Portland General Electric and Oregon Clean Fuels Program will fund electric buses and charging infrastructure for **5** Oregon school districts
  - Beaverton, Newberg, Portland, Reynolds and Salem-Keizer school districts

## National Policies & Conditions

At least 70 electric truck and bus models are on the market, with many more expected over the next decade. The U.S. had 650 electric buses deployed as of 2019, with at least 1,600 on order or grant-awarded in 45 states. They are mostly battery electric buses (BEB), plus < 100 hydrogen fuel cell buses.

Numerous cities have launched programs to support BEBs, including these infrastructure projects:

- Austin, TX is building a new, dedicated facility including charging capacity for 187 BEBs.
- The California Energy Commission's School Bus Replacement Program includes \$14 million for charging infrastructure for BEB school buses.
- Dominion Energy's pilot program in Virginia will test grid integration of the buses with vehicle-to-grid (V2G) technology. Each electric school bus is equipped with bidirectional charging capabilities.
- Los Angeles, Seattle, NYC and New Jersey all have 100% zero-emission bus commitments before 2040.

*Note: Numbers are rounded properly for simplicity in presentation*

2020

By 2022

24

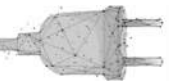


# Transit and School Buses Implications

## What does it mean for OREGON?

- Multiple pilot programs are ongoing in Oregon today
- A partnership between utilities and transit agencies/school districts is highly encouraged
- Funding source is key to transit and school bus electrification

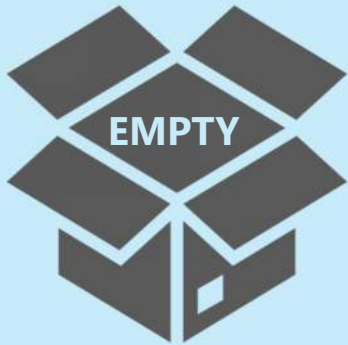
**What have we missed?**



# Use Case: TNCs (Transportation Network Companies)

## Current Conditions

- PGE has developed a subscription-based model that reduces cost for TNC drivers



## Planned Additions

- In Oregon, most stakeholders assume TNC demand is part of the public charging demand, so no TNC-dedicated stations have been announced



## National Policies & Conditions

Lyft and Uber have committed to reach 100% electric vehicles on their platforms in US cities by 2030.

After an initial sharp drop in usage as the COVID pandemic lockdown began, their sales have recovered to about 65% of their 2019 levels, assisted by thriving meal delivery services like “Uber Eats” in the COVID era.

For TNCs to transition to EVs and meet demand, many more public DCFC charging stations will be needed.



Note: Numbers are rounded properly for simplicity in presentation

2020

By 2022

# TNC Implications

## What does it mean for OREGON?

- Today, there is no plan or funding dedicated specifically to provide charging for TNCs vs. general public
- TNC demand can be expected to grow rapidly as TNCs such as Uber and Lyft have announced ambitious 2030 ZEV commitments
- TNC dedicated charging infrastructure may be needed as TNC demand profile is usually different from the general public

**What have we missed?**



# Literature Review: Leading States

# Leading State: Colorado

✓ ZEV State

The Colorado EV Plan 2020 has numerous objectives:

**EV adoption:** Increase adoption of LDV EVs to 10,500 by June 2020, 23,500 by June 2022, and ~940,000 by 2030.

**EV fast-charging corridors:** Building high-speed charging stations at 34 locations across the state's major corridors in partnership with ChargePoint and site hosts.

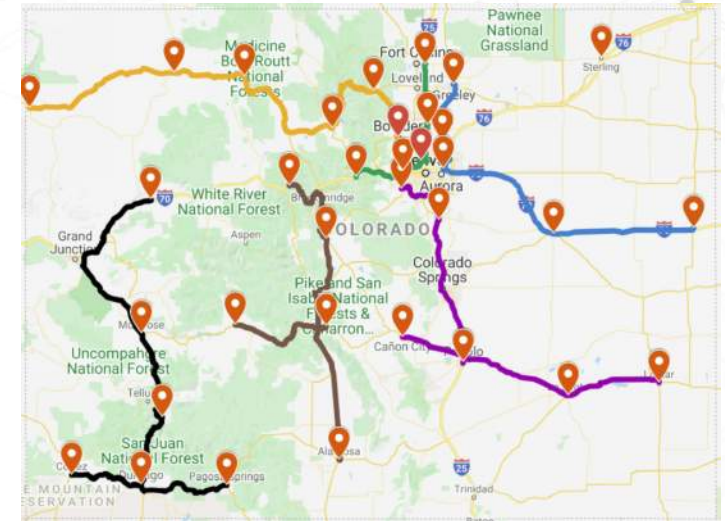
**MHD and transit vehicles:** Complete planning by July 2021 for transition to ZEV MHD and transit vehicles statewide.

**Transit vehicles:** Convert at least 1,000 of the state's transit vehicles to ZEV by 2030, and 100% ZEV no later than 2050.

**Charging infrastructure:** Perform a gap analysis by 2022 to identify the type and number of charging stations needed across the state to meet the 2030 LDV, MDV and HDV goals.

**State agencies:** Increase the number of state agencies that offer workplace charging from 5 in January 2020 to 10 by the end of FY 2022. State agencies will prioritize purchase of ZEVs for light-duty applications and increase the number of ZEVs from 200 at the end of 2020, to 375 by January 2022, and 100% of all appropriate use cases by 2030.

**Full LDV electrification:** Develop a roadmap to full electrification of the light-duty vehicle fleet.



*The Colorado Energy Office's planned DCFC network of 34 sites*

## Key Insights for Oregon:

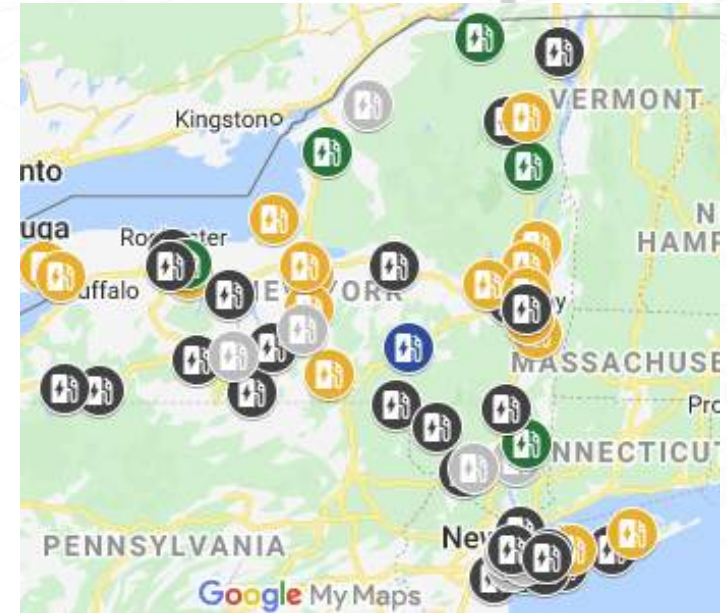
- State agencies currently play a major role
- Just starting out
- Current focus is on outreach and planning

# Leading State: New York

✓ ZEV State

New York has numerous programs supporting transportation electrification, including:

- **Make-Ready Program:** The PSC authorized utilities to invest \$701 million in electric vehicle charging infrastructure. The program aims to support more than 50,000 Level 2 charging plugs and 1,500 DCFC stations funded by the private sector. The Program will cover 50% or 90% of the eligible costs to prepare an EV charger site.
- The Make-Ready Program allocates \$206 million toward "equitable access and benefits for lower-socio-economic and disadvantaged communities," including up to 100% of the costs to make a site ready for EV charging. It also includes \$15 million for MHD EVs to reduce diesel emissions in disadvantaged communities, and \$10 million toward utilities partnering with transit authorities.
- **Evolve NY:** NYPA is building a network of 200, 150 kW DCFC chargers at 50 locations about 50 miles apart across the state. NYPA is also working with the New York State Thruway to upgrade its plaza charging stations.
- **Charge NY:** Gov. Cuomo's goal is to have 10,000 EV charging stations by the end of 2021 and 850,000 zero emission vehicles by 2025.



NYPA's planned EVolve NY network

## Key Insights for Oregon:

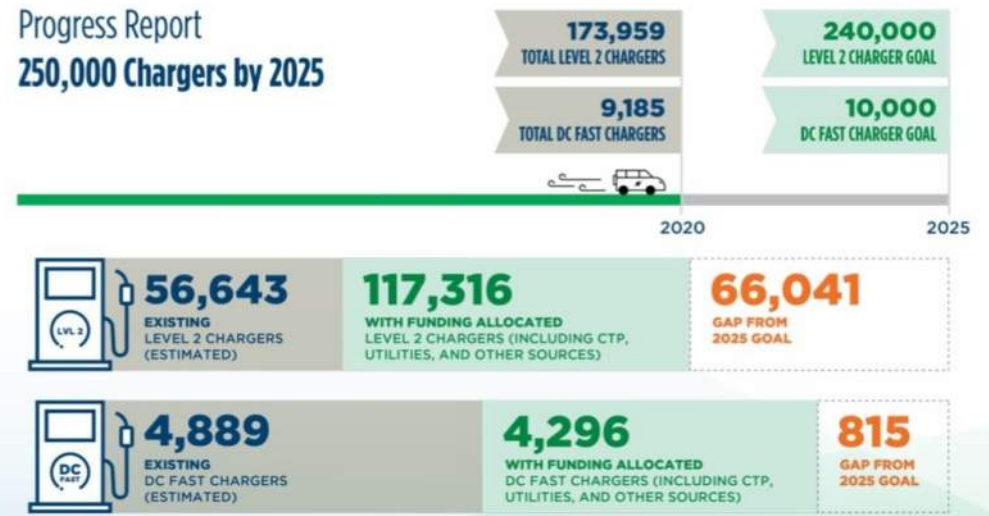
- Heavy reliance on utility actions
- 1/3 of utility infrastructure investments will be in underserved and disadvantaged communities

# Leading State: California

✓ ZEV State

- California has about **half the nation's EVs**, including about 422,000 BEVs and 300,000 PHEVs.
- California's current goals call for **1.5 million EVs by 2025** and **3 million by 2030**. A new goal will require **all new passenger cars and trucks sold in the state to be EV or zero-emissions by 2035**.
- California's 2020-2023 Clean Transportation Program includes:
  - **\$384 million on EV/ZEV infrastructure.**
  - \$133 million for LDV chargers.
  - \$130 million for infrastructure (mostly electric) for zero-emission MHD vehicles.
- Utilities will invest more than \$1 billion in charging infrastructure**, including:
  - \$436 million from SCE to install 38,000 LDV chargers and \$356 million for MHD chargers.
  - \$130 million from PG&E for 7,500 Level 2 chargers.
  - \$100 million from SDG&E to install 3,000 MHD chargers.
- California has many additional programs, such as "EV ready" building codes.

## Progress Report 250,000 Chargers by 2025



## California's Charging Station Outlook

	Level 2	DCFC
Today	57,000	4,900
By 2025	170,000 (↑205%)	9,200 (↑88%)

# Leading State: California

## Key Insights for Oregon

- A variety of programs and funding mechanisms, including
  - Low carbon fuel standard
  - California Energy Commission funding
  - **A dollar on all vehicle registrations** for alternate fuel efforts
  - "Replace your Ride" programs offer **significant incentives to income-qualified** residents/disadvantaged community residents to replace high-polluting old cars with newer, cleaner cars (greatest incentives for electric cars)
- Cost-reducing rebates are for both LDVs and **MD/HDVs**, as well as infrastructure installations
- **Non-monetary ZEV incentives** (HOV lanes, free parking) have helped to foster ZEV adoption





# Future Infrastructure Scenarios

## SCENARIO 1

### Base Case

- Anticipates life as if the pandemic never happened
- Proxy for what "business as usual" might have been

## SCENARIO 2

### Rapid Recovery

- Economy returns to previous vigor by the end of 2021
- Anticipates herd immunity to the pandemic is achieved sometime in 2021
- Proxy for an optimistic outlook

## SCENARIO 3

### Slow Recovery

- Economic activity remains depressed through the end of 2024
- Anticipates difficulty in achieving herd immunity to the pandemic
- Proxy for a pessimistic outlook



# Future Infrastructure Scenarios: Small Group Breakout Sessions (AG Meeting #2)

## GROUP 1

*(Greg Alderson, Stu Green, Zach Henkin, Juan Serpa Munoz)*



**Micro-mobility**

**Transit and  
School Buses**

## GROUP 2

*(Phil Barnhart, Marie Dodds, Jamie Hall, Dexter Turner)*



**Urban**

**Local  
Commercial  
and Industrial  
Vehicles**

## GROUP 3

*(Chris Chandler, Judge Farrar, Joe Hull, Cory Scott, Charlie Tracy)*



**Rural**

**Long-haul  
Trucking**

## GROUP 4

*(Thomas Ashley, Ingrid Fish, Vee Paykar, Jairaj Singh)*



**Disadvantaged  
Communities**

**Transportation  
Network  
Companies**

## GROUP 5

*(Public Audience)*



**Corridor**

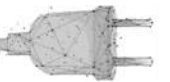
**Urban**

## Break Out Sessions Questions

How quickly will each use case be adopted in Oregon for electrification and why?

What factors should we be sensitive to that could affect the adoption curve for each use case?

What are the unique challenges to adding infrastructure for each use case?

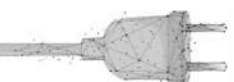


# Next Steps

Preliminary  
Summary of  
Modeling Results

Overview of  
Listening Sessions  
– Preliminary  
feedback

Breakout sessions  
to gather Advisory  
Group input on  
initial Policy  
concepts



# Listening Sessions

- Low income/disadvantaged communities and residents of multi-unit dwellings
- Rural residents and businesses
- EV drivers and advocates
- EVSE (charging infrastructure) service providers
- Developers and property managers/owners
- Transportation Network Companies (TNCs)
- Micro-mobility users and providers
- Employers with workplace charging opportunities
- Farming/Ranching operators
- Transit service providers
- OEMs and EV Dealers
- Freight and Delivery services

