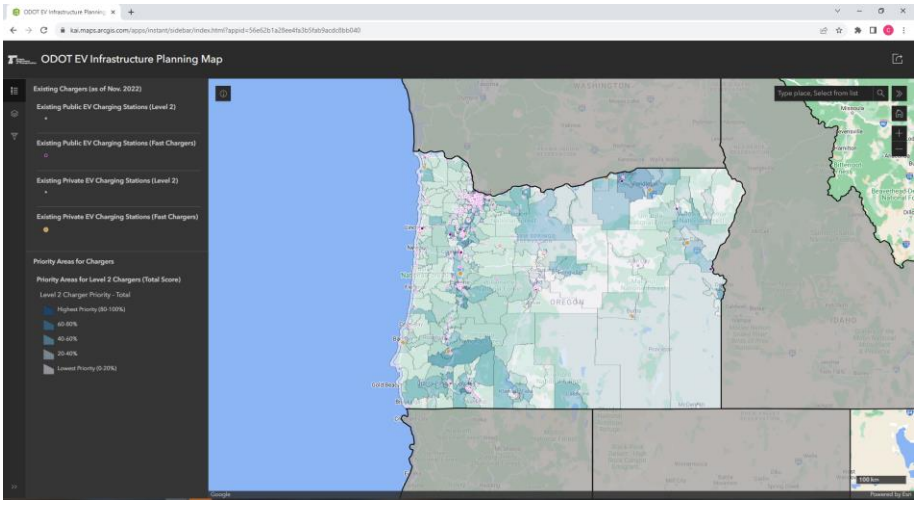
EV INFRASTRUCTURE PLANNING MAP

The Oregon Department of Transportation (ODOT) Climate Office, in partnership with the Oregon Department of Energy, completed the Transportation Electrification Infrastructure Needs Analysis (TEINA study) in June 2021 to identify charging needs and gaps across Oregon.

As follow-up to this work, in 2023 the ODOT Climate Office released the EV Infrastructure Planning Map[1], an interactive mapping tool designed to help local planners and decision makers identify priority areas for EV charging in their communities and across Oregon. A screenshot of the tool is shown in Figure 1.

Figure 1: EV Infrastructure Planning Map



This User Guide has been provided to orient users to the Tool, explain its features and demonstrate use through sample scenarios. A video tutorial of the tool is also provided on ODOT's TEINA webpage. The accompanying Appendix A details the methodology used to create the map, including a description of each data layer and its source. The underlying dataset is available for download as a geodatabase and can be used for custom analyses. For further information or assistance, please contact Jillian DiMedio of ODOT's Climate Office at jillian.dimedio@odot.us.gov.

1 https://geo.maps.arcgis.com/apps/instant/sidebar/index.html?appid=9a90b713506847048d3a17d56dac36e1

USER GUIDE

Intended Audience and Uses

The EV Infrastructure Planning Map is intended for use by state and local agencies, municipal planners and decision-makers, EV charging companies, electric utilities, commercial businesses, landowners/developers and any other stakeholders interested in installing EV charging in Oregon.

The tool is designed to aid planning efforts, primarily by identifying census tracts where siting charging infrastructure can further goals related to high station utilization, filling network gaps and achieving an equitable distribution of charging stations. Some datasets are provided at a parcel or census block resolution (more detailed than census tracts), which can be used to identify particular sites for charging infrastructure.

Several sample use cases are included in the User Guide:

- Use Case #1: An Oregon municipality is seeking a grant for public Level 2 charging that prioritizes projects in disadvantaged communities.
  Question: Where do disadvantaged census tracts in this community overlap with commercial areas that have little to no existing public L2 charging infrastructure nearby?
- Use Case #2: A local non-profit is interested in identifying priority areas in their community for an urban fast-charging "hub", that will not only meet their equity goals but also serve many users, including residents of multi-family housing who often lack access to at-home charging.
  Question: Where do high priority areas for fast-charging overlap with areas that have a high density of multi-family homes?
- Use Case #3: An EV charging company is interested in identifying potential locations for public fast charging stations along secondary corridors in Oregon that support a large number of long-distance travelers.
  Question: Which corridors in Oregon should be considered and where along these corridors are ideal site locations?

See "Example Use Cases" for further explanation of how to answer these sample questions utilizing the EV Infrastructure Planning Map.

Included Data

Many data layers related to transportation, land use, and population characteristics are included in the EV Infrastructure Planning Map, chosen for their relevance to siting EV charging stations across the state[2]. In addition, ODOT has combined several data layers to identify priority areas for locating charging infrastructure. These **Priority Areas for Chargers** layers can be used in conjunction with other data layers to answer the specific question a user is asking.

Priority Areas for Chargers Layers

To create priority layers for both L2 and DCFC, a prioritization score was calculated by combining metrics used to identify census tracts in Oregon that are expected to meet the following three criteria:

- Increase the **equitable** distribution of charging infrastructure
- Reduce **charging gaps**
- Be highly **utilized**

The **Priority Areas for Chargers** layers are the result of this analysis, displaying each census tract along a colored gradient based on its score in meeting these three criteria. Those areas with the highest score after consideration of all three criteria are considered "high priority" areas and are displayed as the darkest color. In addition to this "total score" layer that considers metrics related to all three criteria, individual priority layers are also included in the Tool for users who want to consider just one of the above criteria at a time (**Equity**, **Charging Gaps**, or **Utilization)**.

For more information on the methodology to create the Priority Areas for Chargers layers, see Appendix A: Methodology. The metrics utilized to evaluate census tracts for **Equity**, **Charging Gaps**, and **Utilization** are also summarized in Appendix A, as well as an example of calculating the Prioritization Score for two census tracts.

[2] The included data is not exhaustive. If users have an idea for additional data layers that may be helpful in a future version of the EV Infrastructure Planning Map, please contact Jillian DiMedio of ODOT's Climate Office at jillian.dimedio@odot.us.gov.

Additional Data Layers

The EV Infrastructure Planning Map includes additional data layers that are intended to help identify locations for installing EV charging infrastructure depending on a variety of needs. These layers provide additional context beyond the priority layers when identifying locations for EV charging infrastructure. The full list of layers included in the Tool, along with data sources, are included in Appendix A: Data Layer Inventory.

Additional data layers are organized into the following categories:

Existing Chargers: Data on existing chargers are mapped as four distinct layers and are useful for determining gaps in charging infrastructure. Chargers are first divided by whether they are public or private charging stations. Private charging stations may only be available to employees or for the use of fleet vehicles. Additionally, charging stations that can only be used by a subset of vehicle brands are considered private, for example charging stations installed by Tesla that can only be used by Tesla vehicles. Existing Chargers layers are also divided by whether they include DCFC charging or L2 charging.

Transportation or Land Use: Layers such as traffic data, travel corridors, commercial zones, and the location of specific places like park and rides, or rest areas, may be helpful for identifying heavily trafficked or visited places and locations that are ideal for EV charging infrastructure. The EV Charging Ports Needed in 2025 is a layer depicting the expected demand for charging infrastructure utilizing the analysis from the ODOT TEINA study. Please note: several layers are very detailed, so will appear to be grayed out in the legend. To allow these layers to be visible, zoom in on the map.

Population: Layers with information on jobs, existing EV registrations, existing vehicle registrations, and population are displayed as dot density layers. Using this visualization, each dot is representative of one vehicle or person in the census tract, but the location of the dot is random.

Disadvantaged Communities: Layers identifying areas considered "disadvantaged" depending on the definition utilized (e.g. ODOT definition, the Joint Office of Energy and Transportation (JOET) Justice40 definition) are included. ODOT uses its definition for the Community Charging Rebates program while the JOET Justice40 definition is used for the NEVI and other federal funding programs.

Other: Urban, Rural, and Frontier Areas as defined by the Oregon Office of Rural Health are also included in the EV Infrastructure Planning Map, as well as **Utility Service Areas** throughout Oregon.

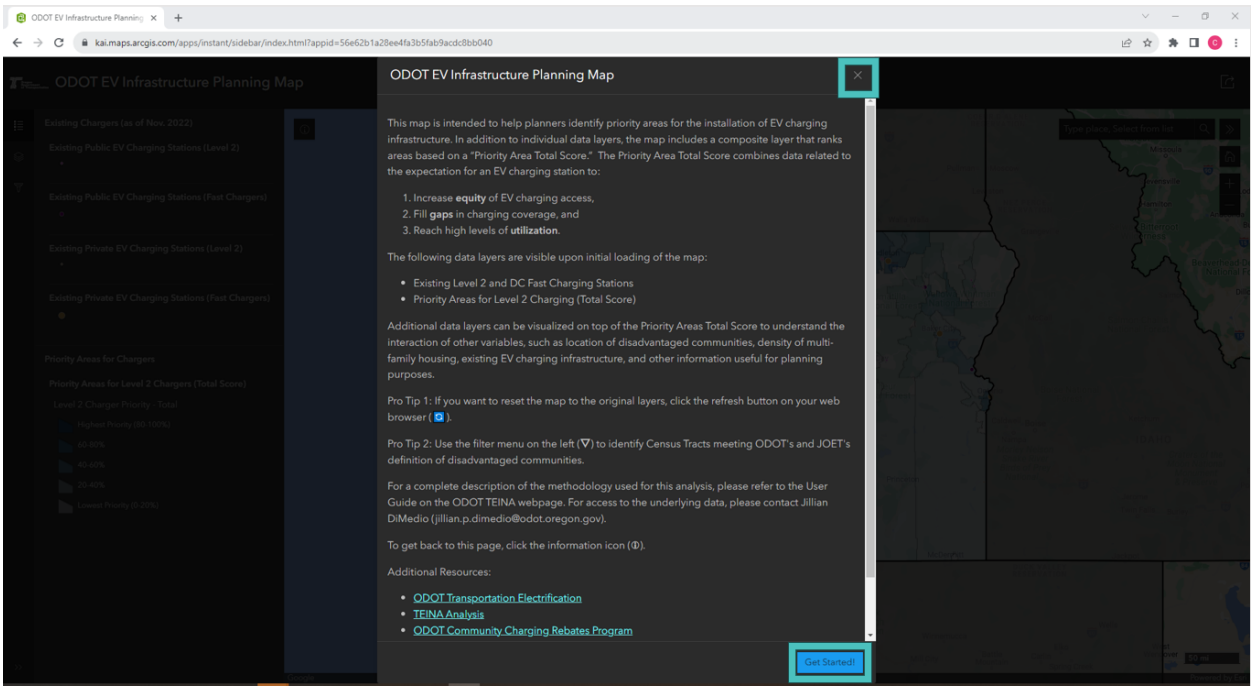
Tool Functions

The EV Infrastructure Planning Map includes several features for users, which are reviewed below.

Introduction Screen

When the EV Infrastructure Planning Map is first launched, an introduction screen will appear. This screen provides background information for the tool, some tips for easy navigation and links to additional resources. To advance past the introduction screen, click the X in the top right or click 'Get Started!' in the bottom right. The Introduction Screen as well as these buttons are shown in Figure 2.

Figure 2: Introduction Screen

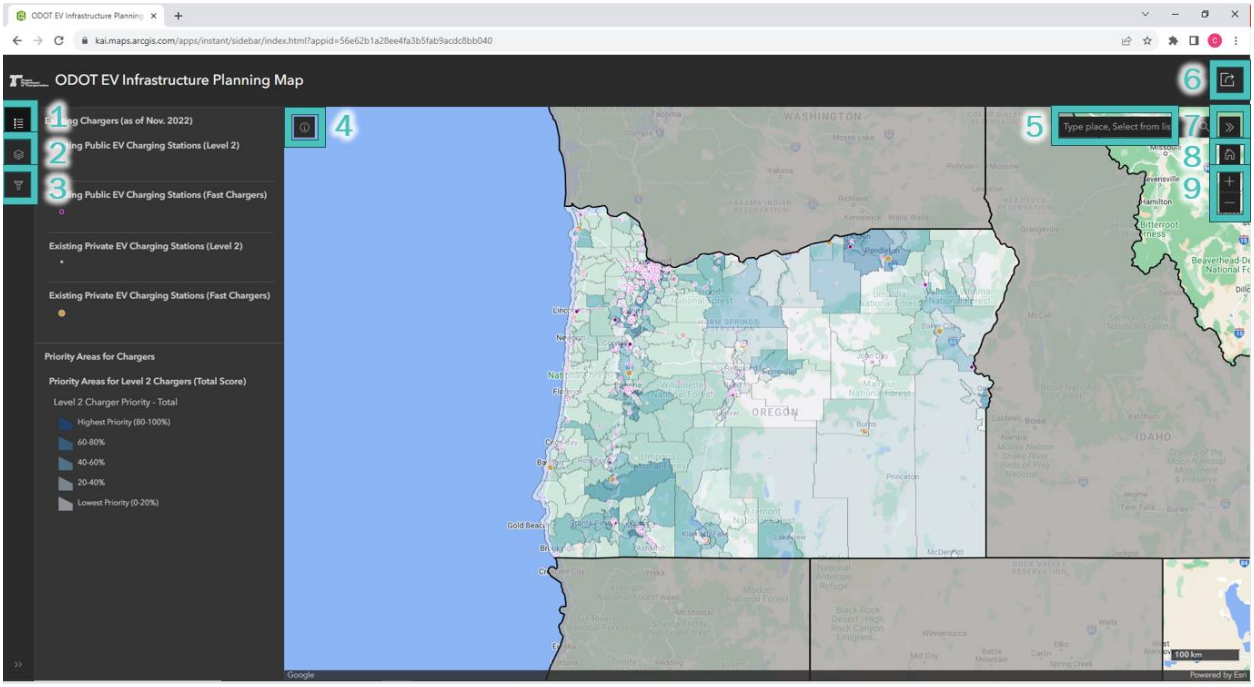


Tool Orientation

After advancing beyond the introduction screen, the EV Infrastructure Planning Map is displayed. Several tools and buttons are shown on the screen to allow the user to navigate the map. The buttons are described below and shown in Figure 3, with the number corresponding to the description.

1. **Legend**: Click on the legend icon to display the legend for the layers that are currently shown on the map. If a layer is not currently visible on the map, it will not display in the legend.
2. **Layers**: Click on the layers icon to display all the layers available in the map. From this view, you can make layers visible or invisible. See the "Turn On/Off Layers" section below for instructions on how to toggle layers on and off.
3. **Filter**: Click on the filter icon to use the filter tool. See the "Filter Tool" section below for instructions on how to use the filter.
4. **Introduction Screen**: Click on the "i" icon to show the introduction screen again.
5. **Address Search**: Click on the magnifying glass icon to open the address search bar, then type in and select an address to zoom in to a particular place. See the "Search for a Location" section for instructions on how to search.
6. **Share**: Click on the share button to share the EV Infrastructure Planning Map via a link or social media.
7. **Hide Address Search**: Click on double arrow icon to hide the address search bar.
8. **Home**: Click on the house icon to return the map to a view of the whole state.
9. **Zoom**: Click on the "+" or "-" icon to zoom in or out on the map. The mouse wheel can also be used to zoom in and out.
10. **Pan**: Click the left mouse button and drag the screen to move around the map.

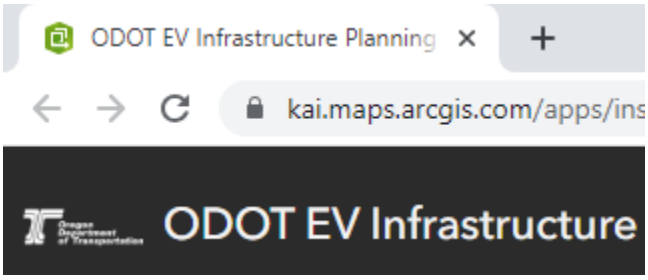
Figure 3: Screen Orientation



Reset the Map

To return the map to the original state, click the refresh button on your internet browser, as shown in Figure 4. **Please note: if you had certain layers selected, that view will be lost once you refresh!**

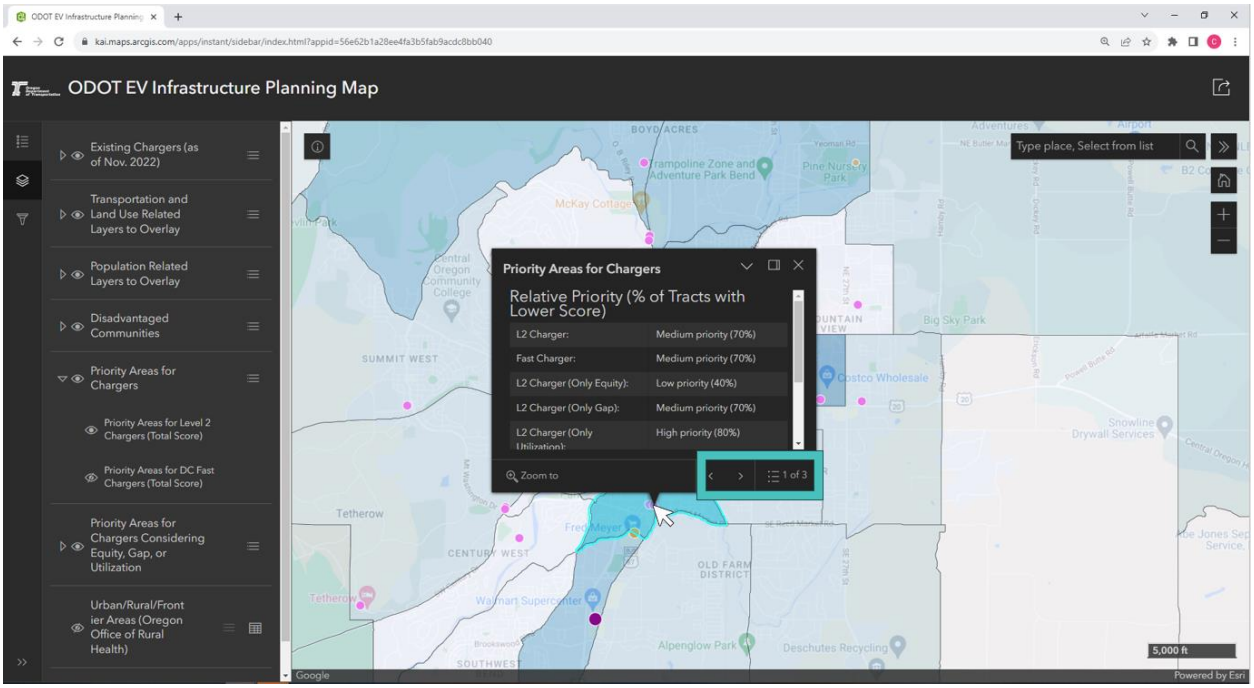
Figure 4: Browser Refresh



Map Feature Details

To view details of individual map features in each data layer, click on the feature in the map. For example, if you click on a census tract when the Priority Areas for Level 2 Chargers (Total Score) layer is turned on, you will see the relative priority for the total score and the score components. If you click on an area that is near multiple map features, you will see arrows in the bottom right of the pop-up table. You can click the arrows to view attributes of the nearby features, as shown in Figure 5.

Figure 5: Map Feature Details



Turn On/Off Layers

The EV Infrastructure Planning Map includes many layers that will overlay on one another once turned on. After identifying the key layers needed to answer a particular question, it can be helpful to turn off the other layers to see results clearly.

To turn layers on or off, follow the steps outlined below and refer to the illustration in Figure 6.

1. Select the layer menu on the left side of the screen.
2. Click the eye icon on the list of layers to turn a layer on or off. When the layer is off, there will be a slash mark through the eye:
3. Some of the layers are grouped together, these groups of layers have a triangle next to them: .. To see all the layers that are grouped together, click the triangle and the list will open. **Make sure that both the top layer and the lower-level layer that you want to show are both turned on.** This is a common user error. See the second screen shot in Figure 7 Figure 6for an example of this occurring.

Figure 6: Illustration of Turning Layers On and Off

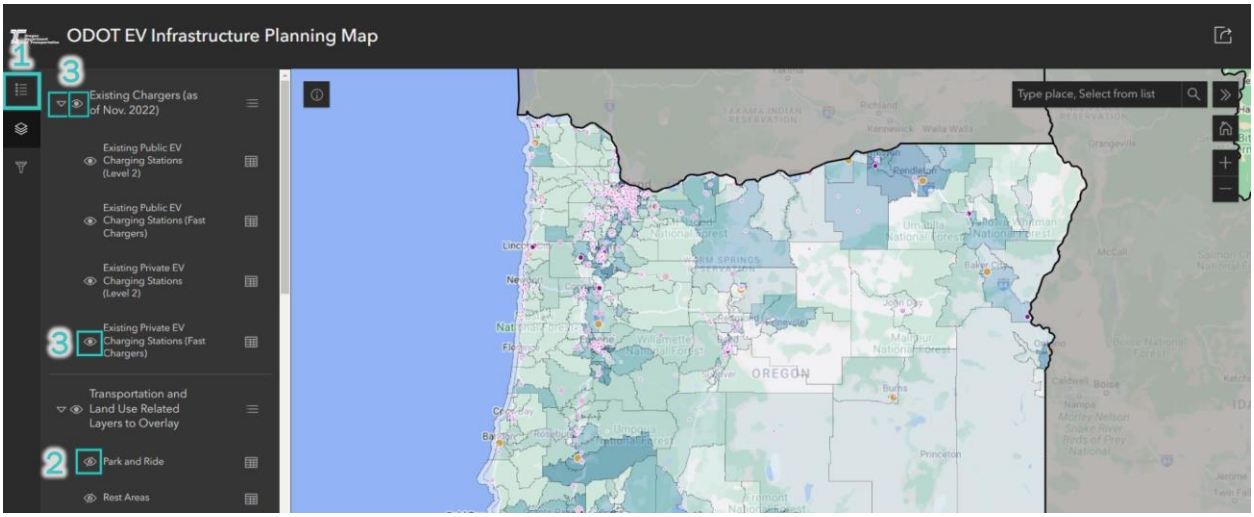
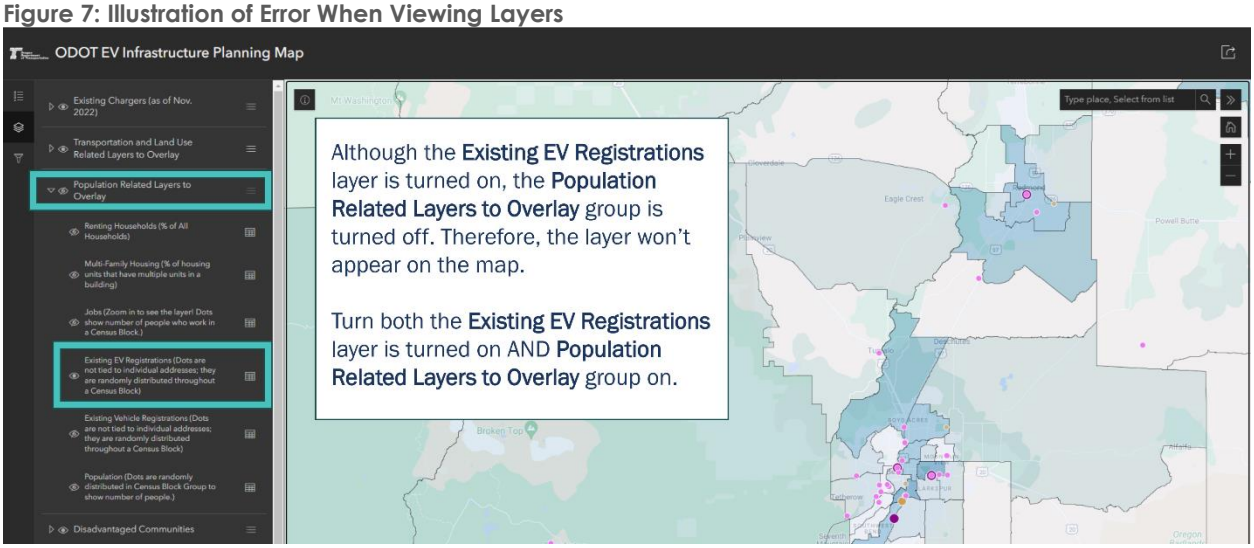


Figure 7: Illustration of Error When Viewing Layers

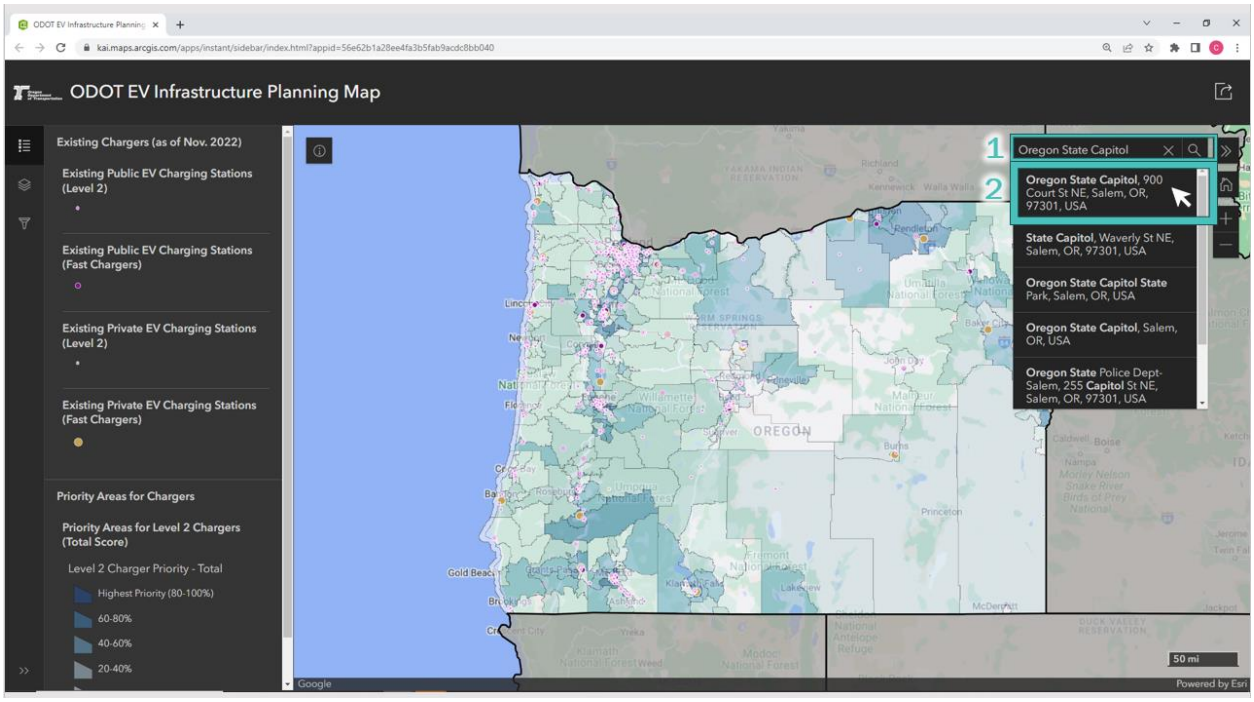


Search for a Location

The EV Infrastructure Planning Map has a search function that allows the user to zoom to a particular location or address. To use the search tool, follow the steps outlined below and refer to the illustration in Figure 8.

1. Begin typing the name of the location or address in the search bar.
2. Select the correct location or address from the pop-up box. Selecting the address from the list that pops up tends to be more precise than just hitting 'enter'.

Figure 8: Illustration of Searching for a Location

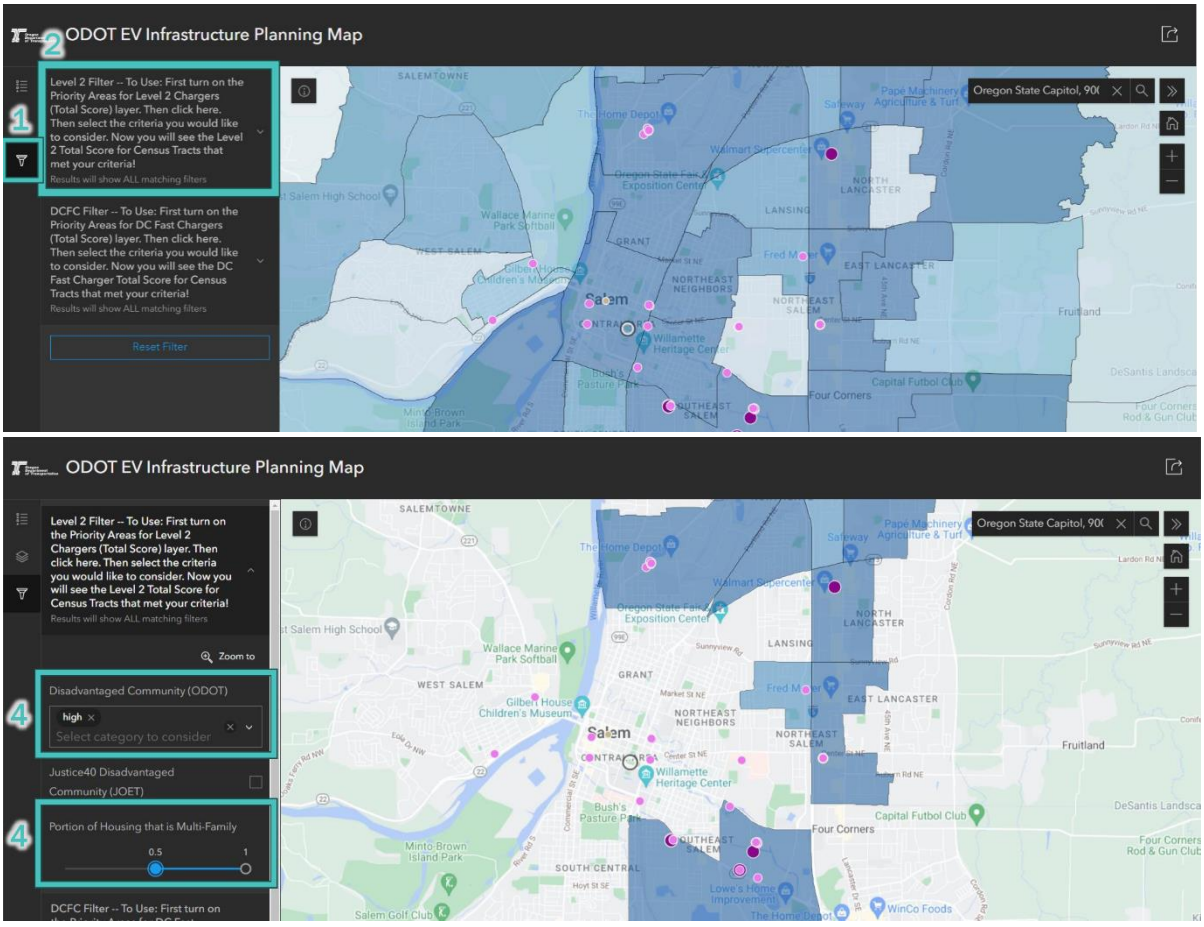


Filter Tool

The EV Infrastructure Planning Map includes a Filter Tool that can be used to filter the Priority Area layers according to criteria related to disadvantaged communities and density of multi-family housing. To use the Filter Tool, follow the steps outlined below and refer to the illustrations in Figure 9.

1. Select the Filter menu from the left side of the screen.
2. Click on the Level 2 Charger or DC Fast Charger filter box, depending on the type of charger you are interested in siting. For this example, we will choose the Level 2 Charger Filter.
3. Turn on the **Priority Areas for Level 2 Chargers (Total Score)** layer. *(Note: If you were using the DC Fast Charger filter, you would turn on the Priority Areas for DC Fast Chargers (Total Score) layer.)* Refer to the Turn On/Off Layer tool function for a refresher on turning layers on and off.
4. Back in the filter tool, select the criteria for which you would like to filter. In this example, we are looking for census tracts in Salem that are both a 'High' Disadvantaged Community per ODOT's definition and with at least 50% of the housing units in multi-family dwellings. *(Note: You could also filter for census tracts that are included in the JOET Justice40 definition of Disadvantaged Communities by clicking on the check box.)* For DAC, select "High" from the drop-down menu under "Disadvantaged Community (ODOT)". For multi-family housing density, drag the left side of the slider bar to "0.5", indicating a minimum density of 50%.
5. The map now displays only those census tracts meeting the criteria outlined above. *(Note: make sure the map is sufficiently zoomed in to the Salem region otherwise the analysis will appear to show that there are no census tracts that meet these criteria.)*

Figure 9: Illustration of Filter Tool



Example Use Cases

The EV Infrastructure Planning Map has many different applications and can be tailored to the needs of each user and their unique priorities. This section includes several examples of how the Tool can be used to answer questions about siting charging infrastructure. These examples are illustrative and were chosen to help users get started and understand the tool's capabilities. In general, users should think about what layers or criteria are important for their specific use case and then manipulate the EV Infrastructure Planning Map to overlay these layers and identify specific regions or census tracts that meet the criteria. Remember, it is not only important to consider the priorities of your organization, but also of the funding source you plan to use to fund the charging infrastructure, if applicable.

Case 1: Identify Location that Aligns with Grant Criteria

Many funding sources have specific criteria they are looking for when evaluating proposals. For example, a funding source may prioritize projects that install public charging infrastructure in disadvantaged communities. A user of the EV Infrastructure Planning Map may ask:

Where do disadvantaged census tracts in my community overlap with commercial areas that have little to no existing public L2 charging infrastructure nearby?

In this example, we will examine the Salem area. The steps are illustrated in Figure 10.

1. By default, the **Priority Areas for Level 2 Chargers (Total Score)** layer is turned on. Census tracts that are darker blue indicate a higher priority for installing Level 2 chargers. This layer alone gives a general idea of the areas that may be ideal for considering a Level 2 charger; however, in this particular use case, we want to also consider several additional criteria: (1) serving disadvantaged communities and (2) closing a gap in the existing charging network and (3) an area with high commercial activity (because we are interested in public charging). These criteria can be further understood by looking at some additional layers.
2. If the funding source references the JOET Justice40 communities as the definition of disadvantaged communities, turn on the **Justice40 Disadvantaged Communities (NEVI)** layer to see where these communities are. Other definitions of disadvantaged communities may be used for other funding sources.
3. The user can search for locations that may close an existing gap in the charging network, by using the **Priority Areas for Level 2 Chargers Considering Gap** layer (found under the Priority Areas for Chargers Considering Equity, Gap, or Utilization group). Census tracts that are darker orange have a greater existing gap in the number of Level 2 chargers.
4. Additionally, the layers showing **Existing L2 Chargers** can provide a visual understanding of gaps in the existing charging network.
5. In the Salem area, some census tracts that are in disadvantaged communities and have an existing gap in the number of Level 2 chargers are: Four Corners, Northgate, and North Lancaster. Locations in these areas may be good proposals for the grant funding described in the use case.
6. After identifying several census tracts that may be good opportunities for installing charging infrastructure, it may be helpful to zoom in and identify specific sites. Zoom in on the Northgate/North Lancaster area using the zoom buttons or the wheel on the mouse.
7. For this example, we will consider the location of commercial land uses as a means of narrowing down potential sites. Turn on the **Commercial Land Uses** layer. Note: for this layer to be displayed on the map, the map must be zoomed in enough. The layer will appear gray in the list on the left side of the screen if the map is not zoomed in enough. (While this exercise will help a planner narrow down a list of potential sites, in practice, additional site characteristics like property owner

interest, existing electrical capacity, and location of electrical infrastructure should also be considered.)

8. Considering the location of commercial land uses in the Northgate/North Lancaster area, the shopping center at the intersection of OR 213 & Lancaster Drive or the Chemeketa Community College campus may provide an ideal location for charging infrastructure. In general, "stop and shop" locations, or areas where visitors are expected to park their vehicles for longer periods of time, are attractive L2 charging locations.

Figure 10: Illustration of Case 1

Case 2: Identify DCFC Location that Has a High Expected Utilization and a High Density of Multi-Family Homes

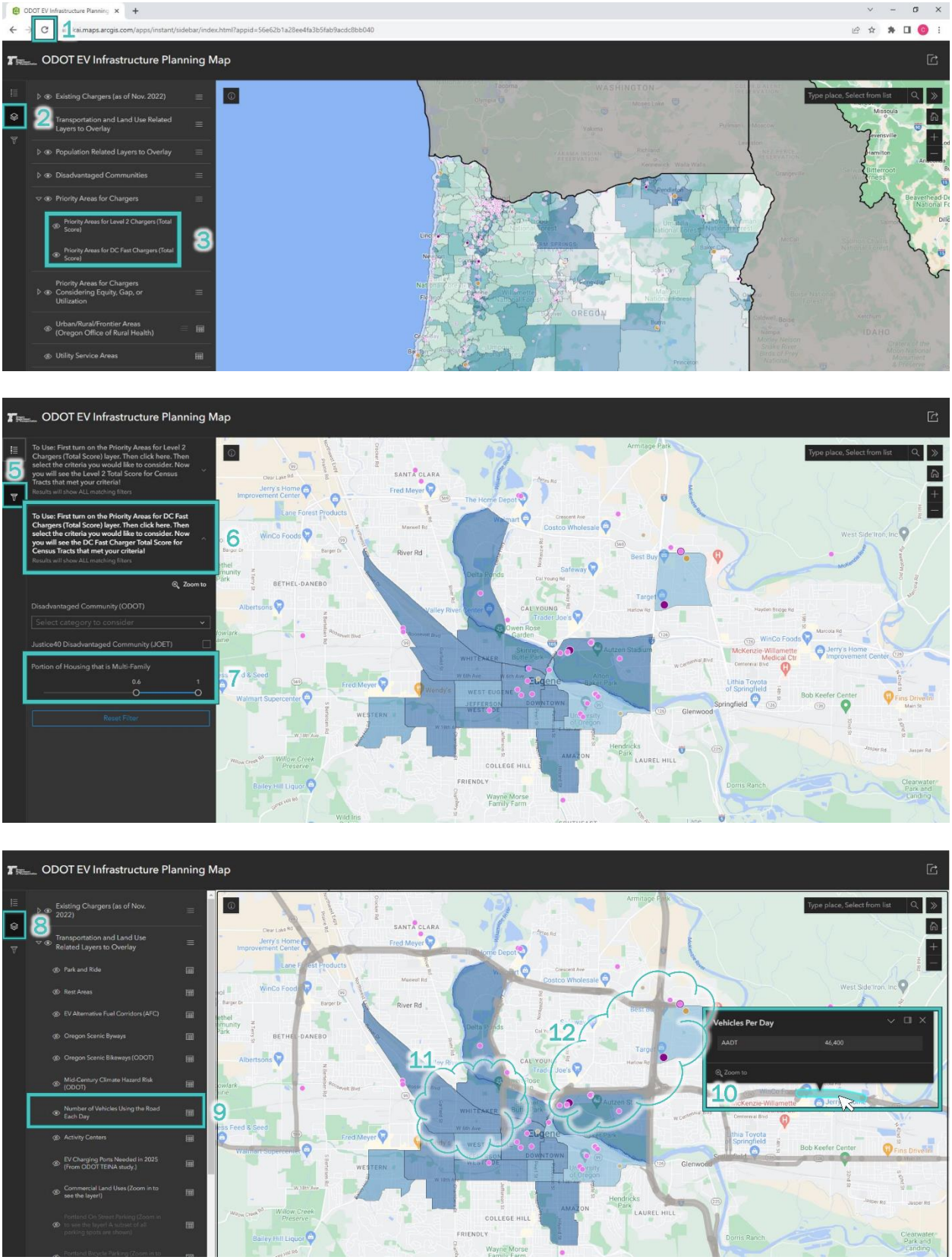
A local non-profit is interested in identifying priority areas in their community for an urban fast-charging "hub", that will not only meet their equity goals but also serve many users, including residents of multi-family housing who often lack access to at-home charging. This user of the EV Infrastructure Planning Map may ask:

Where do high priority areas for fast charging overlap with areas that have a high density of multi-family homes?

In this example, we will examine the Eugene area. The steps are illustrated in Figure 11.

1. If you just completed Case 1, reset the EV Infrastructure Planning Map by clicking 'refresh' on the internet browser.
2. Click on the layer menu.
3. Make sure the **Priority Areas for Level 2 Chargers (Total Score)** layer is turned off and turn on the **Priority Areas for DC Fast Chargers (Total Score)** layer.
4. Zoom in to the Eugene area or use the address search bar to search for Eugene, as described above.
5. Click on the filter tool.
6. Click on the second filter option that says, "*DCFC Filter -- To Use: First turn on the Priority Areas for DC Fast Chargers (Total Score) layer….*" Note: for the filter to work, you must first turn on the correct priority area layer, which should have been done in Step 3.
7. Filter the census tracts to only show those that have at least 60% of housing units in multi-family housing. Drag the minimum (left) end of the slider bar to the right to 0.6, indicating a minimum density of 60%.
8. Click on the layer menu again.
9. Turn on the **Number of Vehicles Using the Road Each Day** layer, found under "Transportation and Land User Layers to Overlay". This layer displays the average annual daily traffic (AADT), with higher daily traffic indicated by a thicker line. Note: this layer only displays data on the roads for which ODOT tracks AADT.
10. Click on any given layer to get more information on the underlying data. In this case, click on a road segment to see the AADT value.
11. To identify potential locations for DCFC, we want to consider locations with a high likelihood that chargers will have a higher utilization and serve multiple users. In this example, we are highlighting census tracts that are a high priority for DCFC based on the priority analysis, that have a high density of multi-family housing units and that are on or near high traffic corridors. DCFC located here will serve multi-family housing residents and drivers passing through on corridors. After the analysis, the Whiteaker area stands out as having a high surrounding portion of multi-family homes and proximity to a high traffic corridor.
12. Though not specifically mentioned in the initial question, it's also useful to note the location of existing DCFC (large dark purple dots), which in this example are congregated on the northeast side of Eugene, around I-5.

Figure 11: Illustration of Case 2



Case 3: Identify Corridors that May Need Charging Infrastructure

ODOT has successfully nominated 11 electric Alternative Fuel Corridors (AFCs) across Oregon through the Federal Highway Administration's (FHWA) Alternative Fuel Corridors program. These electric AFCs are being targeted for fast charging by federal programs such as the National EV Infrastructure (NEVI) program. However, other corridors in Oregon also need fast charging infrastructure to support high volume traffic and/or long-distance travelers. An EV charging company is interested in identifying potential locations for public fast charging stations along these secondary corridors. This user of the EV Infrastructure Planning Map might ask:

Which corridors in Oregon should be considered for fast charging stations and where along these corridors are ideal site locations?

In this example, we will examine the state. The steps are illustrated in Figure 12.

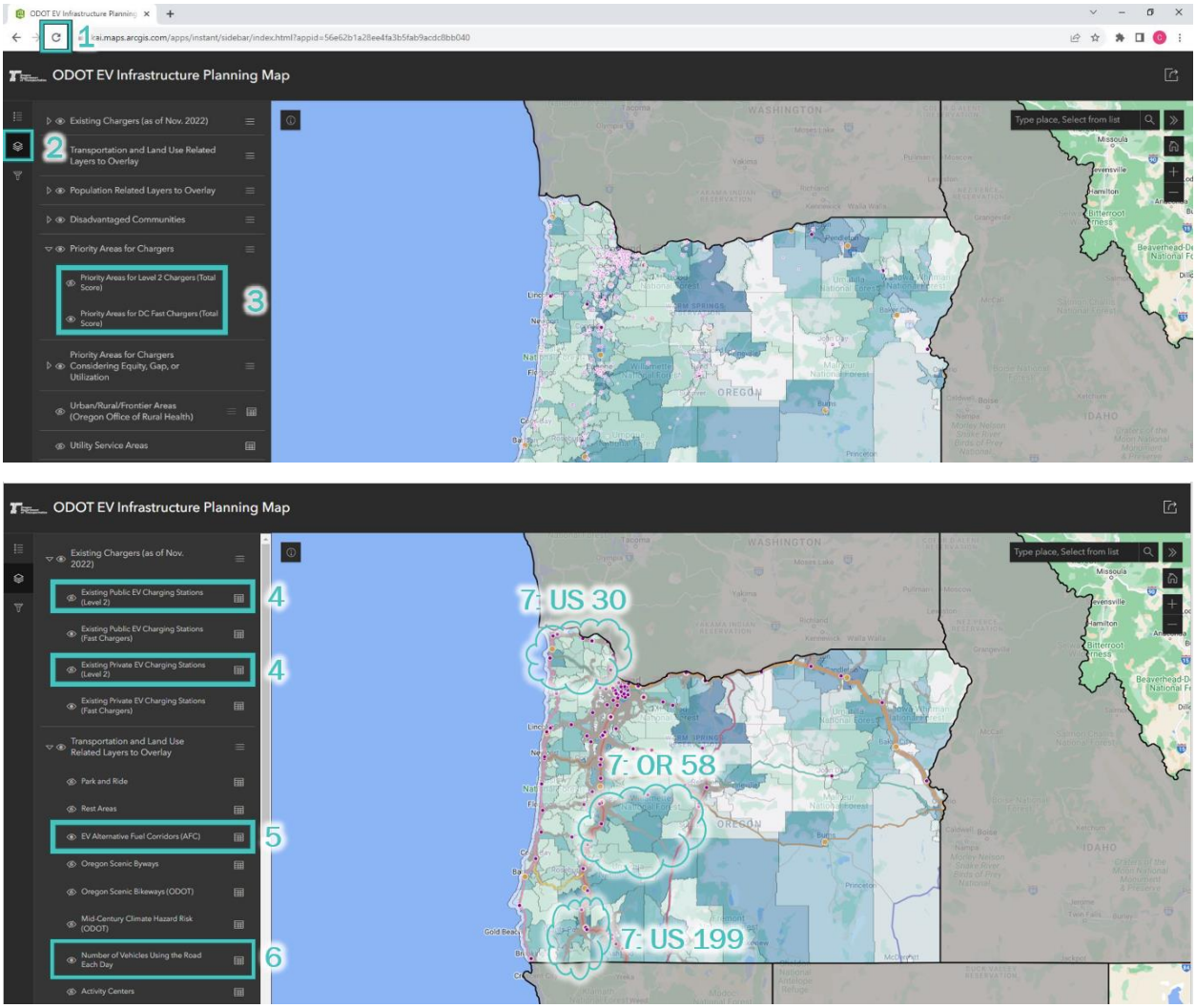
1. If you just completed Case 1 or Case 2, reset the EV Infrastructure Planning Map by clicking 'refresh' on the internet browser.
2. Click on the layer menu.
3. Make sure the **Priority Areas for Level 2 Chargers (Total Score)** layer is turned off and turn on the **Priority Areas for DC Fast Chargers (Total Score)** layer.
4. Turn off the **Existing Public EV Charging Stations (Level 2)** and **Existing Private EV Charging Stations (Level 2)** layers, so the map only shows existing fast chargers. (DCFCs are more appropriate for charging located along corridors, primarily serving corridor traffic.)
5. Turn on the **EV Alternative Fuel Corridors (AFC)** layer to see which corridors are part of the NEVI program. For this scenario, we want to consider corridors that are not AFCs but may have high volumes of trips or still need charging for long distance travelers.
6. Turn on the **Number of Vehicles Using the Road Each Day**.
7. To identify corridors that may need charging infrastructure to address long distance travelers, look for corridors that are at least 50 miles in length, have a relatively high volume of trips along the corridor (indicated by the thickness of the gray line), and are not included in the list of AFCs. On this map, those corridors will look like thick gray lines that do not have a colored line on top. Some examples include US 30 in northwest Oregon, US 199 in southwest Oregon, and OR 58 near central Oregon. Evaluating these corridors for potential DCFC:
    a. **US 30**: There are already a few existing DCFC located on this corridor, providing charging opportunities for travelers.
    b. **US 199**: This is a shorter corridor that extends from I-5 into California. This corridor may be appropriate to collaborate with California to ensure access to charging.
    c. **OR 58**: A longer corridor through the mountains with no existing fast charging infrastructure and a relatively high volume of traffic.

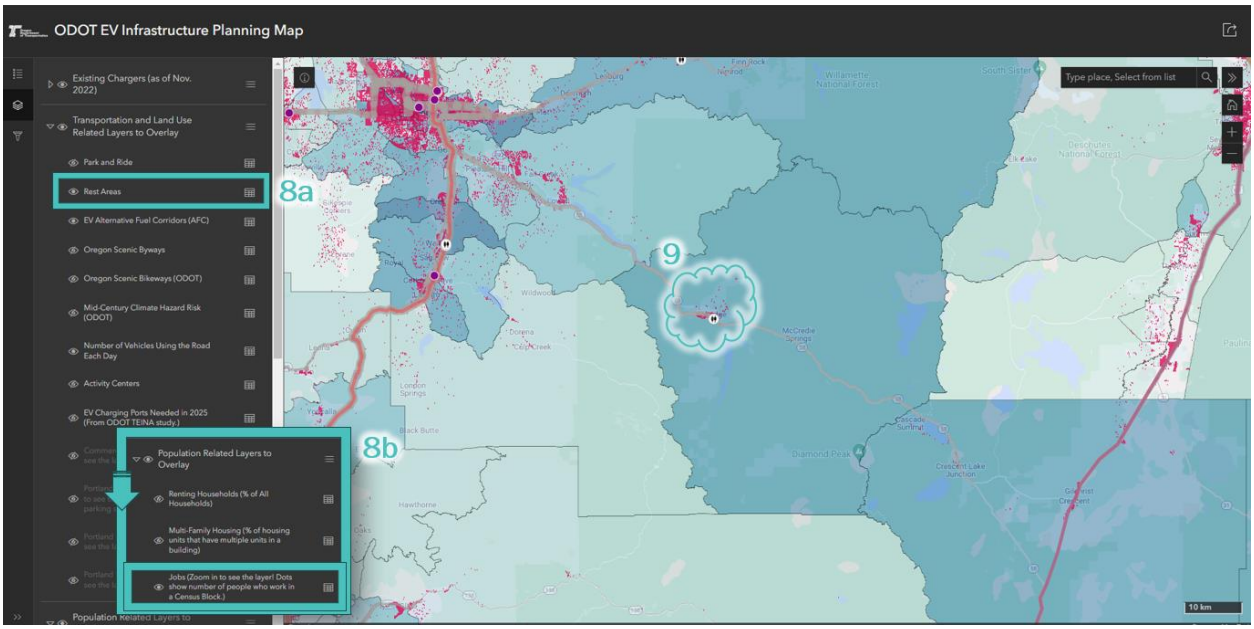
    For this example, we will focus on OR 58.

8. After identifying OR 58 for further investigation, consider where along the corridor may be appropriate for charging infrastructure. In general, identifying sites near existing industrial or commercial development increases the likelihood of nearby electrical infrastructure, which typically results in lower installation costs. These areas will also tend to have other amenities for users of the charging stations (e.g., restrooms, water, shelter, etc.).
    a. To identify this type of location, turn on the **Rest Areas** layer.
    b. Turn on the **Jobs** layer (scroll down on the layer window to see the Jobs layer). The Jobs data is provided for census blocks, which are smaller than census tracts. This provides a greater level of specificity for places with higher activity.

9. Along OR 58, Oakridge stands out as a location where there is an existing rest stop and high density of jobs. This may be a good location for charging infrastructure along OR 58. Further engagement with communities that travel along OR 58, including Oakridge, should be considered during site identification.

Figure 12: Illustration of Case 3





Additional Uses of the Tool

The data included in the EV Infrastructure Planning Map supports a wide range of applications for siting EV charging in Oregon, specific to each user's needs and priorities. Data layers were chosen based on both its relevance to siting EV charging infrastructure and its ease of availability. (Note: some datasets were provided to ODOT by local jurisdictions, e.g., streetlights and on street car and bike parking in Portland.)

While extensive, the underlying data is not exhaustive of the layers that might be useful for this purpose. If the tool is missing functionality to support your needs or you have access to a dataset you'd like to see included, please contact ODOT with suggestions. It may be possible to include additional layers in a future iteration of the Tool. In addition, users may request a download of the data that supports the EV Infrastructure Planning Map if they would like to further manipulate the data using a desktop version of GIS.

APPENDIX A: METHODOLOGY

Methodology for Calculating Prioritization Scores

The Priority Areas for Chargers layers were developed by calculating a prioritization score for each census tract for Level 2 chargers and for DCFC. The prioritization score was calculated by combining metrics used to identify census tracts in Oregon that are expected to meet the following three criteria:

- Increase the **equitable** distribution of charging infrastructure
- Reduce **charging gaps**
- Be highly **utilized**

The layers used to calculate the metrics that are combined in the prioritization score are described in Table 1. Several metrics are only used for the prioritization score for Level 2 chargers or only for DCFC. These metrics are noted in the table below.

Table 1: Metrics for Prioritization Score

	Scoring Metrics	Definitions	Underlying Calculations	Sources
Utilization	*Vehicle Registrations*	Number of all registered passenger vehicles.	Census-tract level vehicle registrations were reallocated from county-level vehicle registration data from the Oregon DMV (2019) proportional to the number of vehicles in each census tract according to the American Communities Survey (2019).	American Community Survey Oregon DMV (Oregon DMV Vehicle Registration Statistics : Oregon Driver & Motor Vehicle Services : State of Oregon).
	Vehicle Miles Traveled (VMT)	Miles traveled by vehicles passing daily through roadways, on average.	**L2:** Calculated as the number of vehicles traveling each segment of roadway within 1 mile of the census tract, multiplied by the length of each segment. The number of vehicles comes from Annual Average Daily Traffic (AADT). **DCFC:** Calculated as the number of vehicles traveling greater than 50 miles on each segment of roadway within 1 mile of the census tract, multiplied by the length of each segment. The number of vehicles travelling greater than 50 miles is estimated using the proportion of trips longer than 50 miles on the segment from the ODOT SWIM multiplied by the Annual Average Daily Traffic (AADT) from ODOT AADT data.	ODOT Traffic Flow (AADT) (ODOT TransGIS (state.or.us)) ODOT SWIM

	Scoring Metrics	Definitions	Underlying Calculations	Sources
	Activity Centers	Location of park-and-rides, rest stops, or business centers.	**L2 & DCFC:** Activity centers were defined as census tracts where more than 7% of the area is commercial land use. Land use is defined using the 2021 Oregon Statewide Land Use from the Oregon Department of Land Conservation. Land use data is not available for Sherman, Douglas, Malheur, and Wallowa counties. In these counties activity centers were manually defined as census tracts overlapping Ontario, Roseburg, and Sutherlin. Binary indicator representing existence of at least 1 activity center within the census tract. **L2:** If a census tract has a park-and-ride location, it is also defined as an activity center, for the Level 2 prioritization score. **DCFC:** If a census tract has a rest stop, it is also defined as an activity center, for the DCFC prioritization score.	Park and Rides (ODOT TransGIS (state.or.us)) Rest Areas (Transportation Data FTP)
Charging Gaps	*Multi-family Housing (MFH) Demand*	Number of MFH units.	NA	ACS 2017-2021 5-Year Estimates (B25024)
	TEINA 2025 Port Needs	Share of TEINA 2025 charging ports not yet achieved.	Calculated as the percentage difference between sum of existing ports and total required ports in the census tract as given in the 2025 TEINA results, distinguished by L2 and DC fast charger types.	TEINA
Equity	*Multi-family Housing (MFH) Density*	Share of MFH of total housing units.	Calculated as the percentage of MFH units of total units in the census tract.	ACS 2017-2021 5-Year Estimates (B25024)
	PM2.5	PM 2.5 ppm level percentiles by census tract.	NA	EPA EJScreen 2021
	Ozone	Ozone level percentiles by census tract.	NA	EPA EJScreen 2021
	Disadvantaged Communities	Level of ODOT DAC Classification, i.e., Medium-High or High.	Trinary indicator scoring the DAC classification of a census tract from no or low DAC, med-high DAC, and high DAC on a scale of 0-2.	ODOT Statewide Equity Layer (Webmap)

The prioritization scores are calculated following this process:

1. Calculate the value for each of the scoring metrics for each census tract
2. Assign points for each scoring metric.
    a. Most of the scoring metrics have points assigned according to the quantile (bucket of 25%) the census tract is in, relative to the state.
    b. Some scoring metrics have points assigned a different way.
3. Average the points each scoring metric received, for equity, utilization, and gap.
4. The prioritization score equals the weighted sum of the points for equity, utilization, and gap.

Step 2: Assign Points for Each Scoring Metric

This section describes the process used to assign points to each census tract for each scoring metric. Most of the scoring metrics have points assigned to the census tract based upon the quantile the census tract is in, compared to the state. The quantile ranges for each relevant scoring metric are included in Table 2. In each quantile there are 25% of the census tracts in the state. For example, the top 25% of census tracts according to that scoring metric are included in the top quantile (100%).

Table 2: Quantiles for Metrics used for Prioritization Score

	Scoring Metrics	25%	50%	75%	100%
Points Assigned		0.25	0.5	0.75	1
Utilization	*Vehicle Registrations*	≤2,439	2,439 – 3,197	3,197 – 4,195	>4,195
	Total Vehicle Miles Traveled (VMT)	≤122,662	122,662 – 259,203	259,203 – 567,544	Above 567,544
	Long Distance Vehicle Miles Traveled (VMT)	Less 13,488	13,488 - 44,712	44,712 - 108,486	>108,486
	*Activity Centers**	-	-	-	-
	Park and Ride	-	-	-	-
	Rest Stop	-	-	-	-
Charging Gaps	*Multi-family Housing (MFH) Units*	<122	122 - 382	382 - 744	>744
	TEINA 2025 L2 Port Need	<0%	0%	0.6%	>97%
	TEINA 2025 DCFC Port Need	<0%	0% - 50%	50% - 80%	>80%
Equity	*Portion of Housing that is Multi-family Housing (MFH)*	<8%	8% - 22%	22% - 40%	>40%
	PM2.5	≤11.5	11.5 - 23	23 - 62	>62
	Ozone	≤13	13 - 26	26 - 61	>61
	*Disadvantaged Communities**	-	-	-	-

The metrics for Activity Centers and Disadvantaged Communities are calculated differently.

- Activity Center:
    - If a Census Tract has >7% of the area categorized as a Commercial Land Use, the Census Tract is considered an **Activity Center**. Commercial land uses are defined in the Oregon Statewide Land Use data provided by the Oregon Department of Land Conservation. Approximately 40% of Census Tracts in Oregon have at least 7% of the area categorized as Commercial Land Use. Land Use data is not available for Sherman, Douglas, Malheur, and Wallowa Counties. In these counties, Activity Centers are manually defined as the Census Tracts overlapping with Ontario, Roseburg, and Sutherlin.
    - If a Census Tract has at least 1 park and ride location, it is also given a point for Activity Center for the Level 2 score.
    - If a Census Tract has at least 1 rest stop location, it is also given a point for Activity Center for the DCFC score.
- Disadvantaged Communities:
    - If a Census Tract is defined as "High" disadvantaged by ODOT then score 1 point.
    - If a Census Tract is defined as "Medium-High" disadvantaged by ODOT then score 0.5 point.

Step 4: Calculate the Weighted Prioritization Score

The overall **Prioritization Score** is calculated as a combination of the **Equity**, **Charging Gaps**, and **Utilization** scores, according to the weights in Table 3.

Table 3: Weighting of Attribute Scores for Prioritization Score

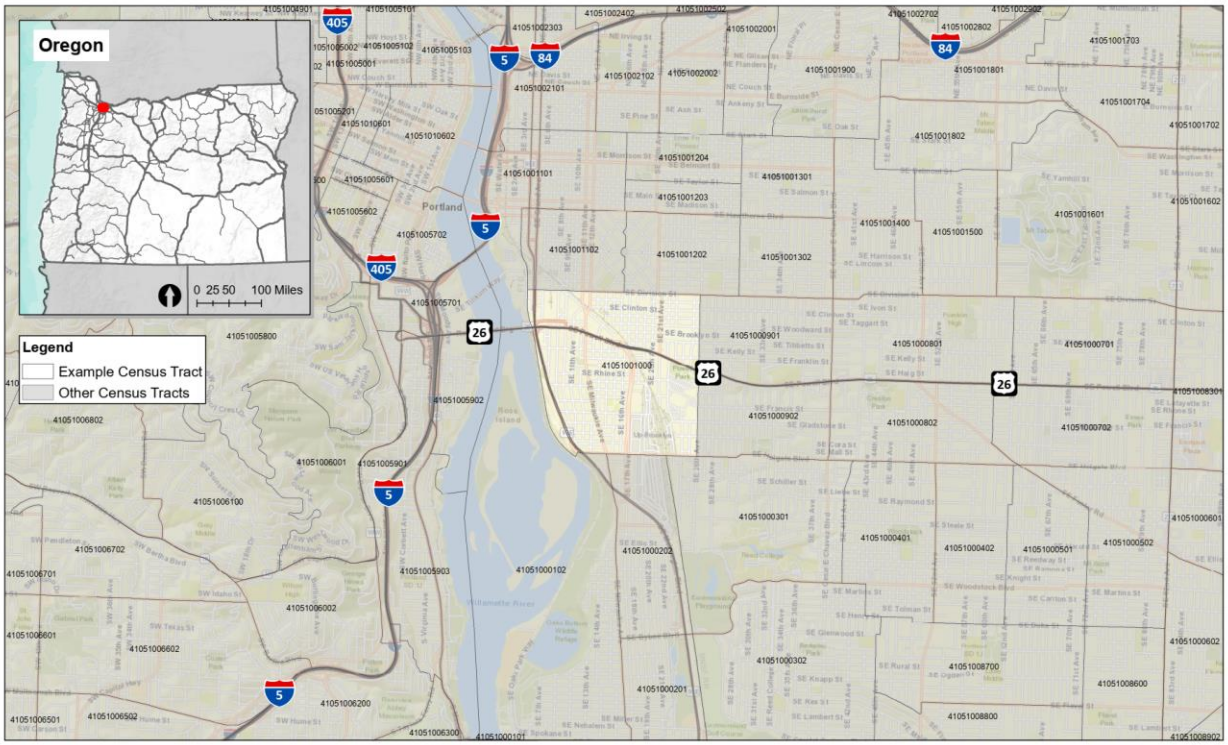
Attribute Score	Weighting for Prioritization Score
Equity	40%
Charging Gaps	35%
Utilization	25%

Example of Calculating Prioritization Score

The methodology is demonstrated for two sample Census Tracts in Oregon, shown in Figure 13.

Figure 13: Example of Census Tracts with Prioritization Score Calculated

Example of Prioritization Scoring Method



Example of Prioritization Scoring Method

The values for each of the scoring metrics for the example census tracts are included in Table 4. Additionally, the percentile the census tract is in the state for each scoring metric is included, along with the score assigned to the census tract for the specific scoring metric. A Level 2 score is calculated separately from a DCFC score. Several metrics only apply to the Level 2 score or DCFC score. These metrics are shown in the table as a shaded box.

Table 4: Example Calculation of Metrics for Prioritization Score

Scoring Metrics		Ex. 1 Value	Ex. 1 % in State	Ex. 1 L2 Score	Ex. 1 DCFC Score	Ex. 2 Value	Ex. 2 Percentile in State	Ex. 2 L2 Score	Ex. 2 DCFC Score
Census Tract		Downtown Medford 41029000100				Brooklyn Neighborhood (SE Portland) 41051001000			
Utilization	*Vehicle Registrations*	923	2%	0.25	0.25	3,429	57%	0.75	0.75
	Total Vehicle Miles Traveled (VMT)	600,361	78%	1		1,128,072	94%	1	
	Long Distance Vehicle Miles Traveled (VMT)	86,145	70%		0.75	130,408	79%		1
	Park and Ride	1	-	1		-	0%	1	
	Activity Centers	1	-		1	1	75%		1
	Rest Stop	-	-			-	0%		
Charging Gaps	*Multi-family Housing (MFH) Demand*	571	64%	0.75	0.75	1,297	93%	1	1
	TEINA 2025 L2 Port Need	88%	29%	0.75		1	35%	1	
	TEINA 2025 DCFC Port Need	0%	4%		0	1	16%		1
Equity	*Multi-family Housing (MFH) Density*	63%	91%	1	1	0	82%	1	1
	PM2.5	98	99%	1	1	63	76%	1	1
	Ozone	93	95%	1	1	40	58%	0.75	0.75
	Disadvantaged Communities	1	-	1	1	2	79%	2	2

The scores for each scoring metric are aggregated to the criteria of equity, gaps, and utilization. The scores are averaged for all of the scoring metrics corresponding to each criteria. The overall prioritization score is calculated as the sum of the scores for each of the criteria (equity, gaps, and utilization). This process is shown for the example census tracts in Table 5.

Table 5: Example Calculation of Prioritization Score

Attribute Score	Weighting for Prioritization Score	Example 1 L2 Score	Example 1 DCFC Score	Example 2 L2 Score	Example 2 Score
Equity	40%	1.0	1.0	1.2	1.2
Charging Gaps	35%	0.8	0.4	1.0	1.0
Utilization	25%	0.8	0.7	0.9	0.9
Overall Prioritization Score			0.9	0.7	1.1

Data Layer Inventory

The data layers that are included in the EV Infrastructure Planning Map are summarized in Table 6. Some example ways that the data may be used are included. Data layers may be used for other purposes, depending on the question the user is answering.

Table 6: Data Layer Inventory

Category	Data	Source	Ways Data may be Used
Existing Chargers	Existing L2 EV Charging Stations - Public and Private	Alternative Fueling Station Locator (Alternative Fuels Data Center: Alternative Fueling Station Locator (energy.gov))	Understand the existing charging network. It may be appropriate to prioritize sites that are not near existing charging infrastructure.
	Existing DCFC Charging Stations - Public and Private	Alternative Fueling Station Locator (Alternative Fuels Data Center: Alternative Fueling Station Locator (energy.gov))	
Transportation and Land Use Related Layers to Overlay	Park and Rides	ODOT (ODOT TransGIS (state.or.us))	Park and rides provide a good use case for Level 2 charging. People who park at a park and ride are often leaving their vehicle for several hours, whether to travel to work or other places. This longer dwell time allows vehicles to receive a

Category	Data	Source	Ways Data may be Used
			significant charge from a Level 2 charger. It is unlikely that someone parked at a park and ride will move their vehicle directly after charging is complete, so a fast charger is less appropriate.
	Rest Areas	ODOT (Transportation Data FTP)	Rest areas provide existing amenities for charging station users, such as restrooms, water, or shelter. Note: rest stops within the interstate right-of-way may not be eligible to charge customers a fee for use of EV chargers.
	EV Alternative Fuel Corridors (AFC)	US Department of Energy. (EV Web Map v2_WFL1 - Overview (arcgis.com))	EV AFC are eligible for some federal funding programs like NEVI and are prioritized for installing charging infrastructure to support high traffic volumes, local traffic, or long distance travel.
	Oregon Scenic Byways	ODOT (ODOT TransGIS (state.or.us))	Corridors that are likely to support tourism traffic because of their natural beauty or proximity to attractions.

Category	Data	Source	Ways Data may be Used
	Oregon Scenic Bikeways (ODOT)	ODOT (ODOT TransGIS (state.or.us))	Charging stations along Scenic Bikeways or other bike routes may be prioritized for including infrastructure for charging e-micromobility (e.g. 110 V outlets).
	Mid-Century Climate Hazard Risk (ODOT)	ODOT Climate Hazard Risk Map (ODOT Climate Hazard Risk (arcgis.com))	Charging stations located in areas at risk for several climate hazards should consider incorporating resiliency into site selection and design.
	Number of Vehicles Using the Road Each Day	ODOT Traffic Flow (AADT) (ODOT TransGIS (state.or.us))	Locating charging infrastructure on high activity corridors may increase utilization of a station and increase convenience for EV drivers.
	Activity Centers	Oregon Statewide Land Use (Oregon Department of Land Conservation). If a Census tract has >7% of the area categorized as a Commercial Land Use, the census tract is considered an Activity Center. Approximately 40% of census tracts in Oregon have at least 7% of the area categorized as Commercial Land Use. Land Use data is not available for Sherman, Douglas, Malheur, and Wallowa Counties. In these	Locating charging infrastructure in activity centers allows users to take advantage of existing amenities and may support existing businesses.

Category	Data	Source	Ways Data may be Used
		counties, Activity Centers are manually defined as the census tracts overlapping with Ontario, Roseburg, and Sutherlin.	
	EV Charging Ports Needed in 2025	ODOT TEINA study	Areas with a high forecasted need of chargers based on the TEINA study may be prioritized for installing charging infrastructure.
	Commercial Land Uses	Oregon Statewide Land Use (Oregon Department of Land Conservation)	Areas with commercial land uses tend to have amenities that users can take advantage of and chargers here are likely to be conveniently located for users. Additionally, commercial land uses may be indicative of nearby electrical infrastructure.
	Portland On Street Parking	PBOT (PortlandMaps: Metadata)	Portland is considering a program for installing L2 chargers to serve on street parking spots.
	Portland Bicycle Parking	City of Portland (Bicycle Parking | Bicycle Parking | City of Portland, Oregon (arcgis.com))	
	Portland Street Lamps	City of Portland (Street Lights – Portland Maps Open Data)	Portland is considering a program for installing L2 chargers to serve on street parking spots that

Category	Data	Source	Ways Data may be Used
			could be mounted to existing street lamps.
Population Related Layers to Overlay	Renting Households	ACS 2017-2021 5-Year Estimates (B25003)	Renting households may have less access to at-home charging. Installing public charging in areas with high numbers of renting households increases access to charging.
	Multi-family Housing	ACS 2017-2021 5-Year Estimates (B25024)	Households in multi-family homes may have less access to at-home charging. Installing public charging in areas with high numbers of multi-family units may increases access to charging.
	Jobs	US Census LEHD-LODES (OnTheMap (census.gov))	Areas with a high job density are especially important to consider for locating Level 2 charging intended to support workplace charging. Additionally, areas with high densities of jobs may be indicative of activity centers.
	Existing EV registrations	Oregon Electric Vehicle Dashboard (State of Oregon: DATA & REPORTS - Oregon Electric Vehicle Dashboard)	Areas with high existing EV registrations may have a higher utilization of charging infrastructure currently. Over time,

Category	Data	Source	Ways Data may be Used
			the access to EVs may be assessed for equity considering the distribution of EV adoption throughout the community.
	Existing vehicle registrations	Oregon DMV (Oregon DMV Vehicle Registration Statistics : Oregon Driver & Motor Vehicle Services : State of Oregon). The ratio of vehicles in a census block group to those in a county multiplied by the total number of vehicle registrations in the county as given in the 2019 ACS.	Areas with high existing vehicle registration may be indicative of areas that will have a higher adoption of EVs.
	Population	ACS 2017-2021 5-Year Estimates (B01003)	Areas with higher population may be indicative of areas that should have more charging installed to serve local needs.
Disadvantaged Communities	ODOT Disadvantaged Communities	ODOT Statewide Equity Layer (Webmap)	Disadvantaged communities are likely to have less existing charging infrastructure and less access to at-home charging. Locating charging infrastructure in DACs is important for increasing equitable access to EV charging. In addition, some funding sources may require stations to be located in or serve disadvantaged

Category	Data	Source	Ways Data may be Used
			communities. When charging infrastructure is intended to serve a disadvantaged community, additional considerations may be appropriate including charging rates for nearby residents who are relying on public charging, rather than at home charging.
	Justice 40 Disadvantaged Communities (NEVI)	US JOET Justice 40 definition of DAC. (ArcGIS Dashboards)	Disadvantaged communities are likely to have less existing charging infrastructure and less access to at-home charging. Locating charging infrastructure in DACs is important for increasing equitable access to EV charging. In addition, Additionally, federal funding including NEVI requires at least 40% of benefits of investment to go to disadvantaged communities.
	Air Quality Index	US EPA EJScreen Tool (Webpage). Census tracts are ranked by the PM 2.5 concentration relative to other census tracts in Oregon.	Areas with worse air quality may have a greater benefit of electrifying transportation,

Category	Data	Source	Ways Data may be Used
			reducing emissions along corridors.
Urban/Rural/Frontier Areas	Areas Classified as Urban, Rural, or Frontier	Oregon Office of Rural Health (ORH Urban Rural map | OHSU)	Urban, Rural, and Frontier areas may have different needs for EV charging infrastructure.
Utility Services Areas	Utility Service Areas	Oregon Department of Energy	Each electric utility has different processes, technical support and incentives and existing grid capacity for installing charging infrastructure. Project planners should know who their electric utility is and reach out early in the process when installing EV charging.
Priority Areas for Chargers	Priority Areas for Level 2 Chargers - Total L2 Score	The three priority areas for categorizing the EV Infrastructure are Equity, Gap, and Utilization. Equity focuses on areas with disadvantaged communities, high air pollution, and high concentration of multi-family housing. Gap targets regions with insufficient EV infrastructure to enhance its scalability. Utilization prioritizes areas with high vehicle and travel density.	Several criteria are aggregated to identify census tracts that have the highest priority for installing charging infrastructure.
	Priority Areas for Fast Chargers - Total DCFC Score		
Reasons used to prioritize an area	L2 Equity Score	Considers ODOT's definition of disadvantaged communities, air quality	Subsets of the prioritization score that look at only one

Category	Data	Source	Ways Data may be Used
		index, and density of multi-family housing.	aspect of the prioritization score. These layers may be appropriate if the user wishes to emphasize a specific piece of the prioritization score.
	L2 Gap Score	Considers the number of existing ports compared to the number of EV Charging Ports Needed in 2025	
	L2 Utilization Score	Considers Total VMT, commercial centers, park and rides, number of vehicle registrations, and number of EV registrations.	
	DCFC Equity Score	Considers ODOT's definition of disadvantaged communities, air quality index, and density of multi-family housing.	
	DCFC Gap Score	Considers the number of existing ports compared to the number of EV Charging Ports Needed in 2025	
	DCFC Utilization Score	Considers Long Distance VMT (more than 50 miles), commercial centers, rest areas, and number of vehicle registrations.	