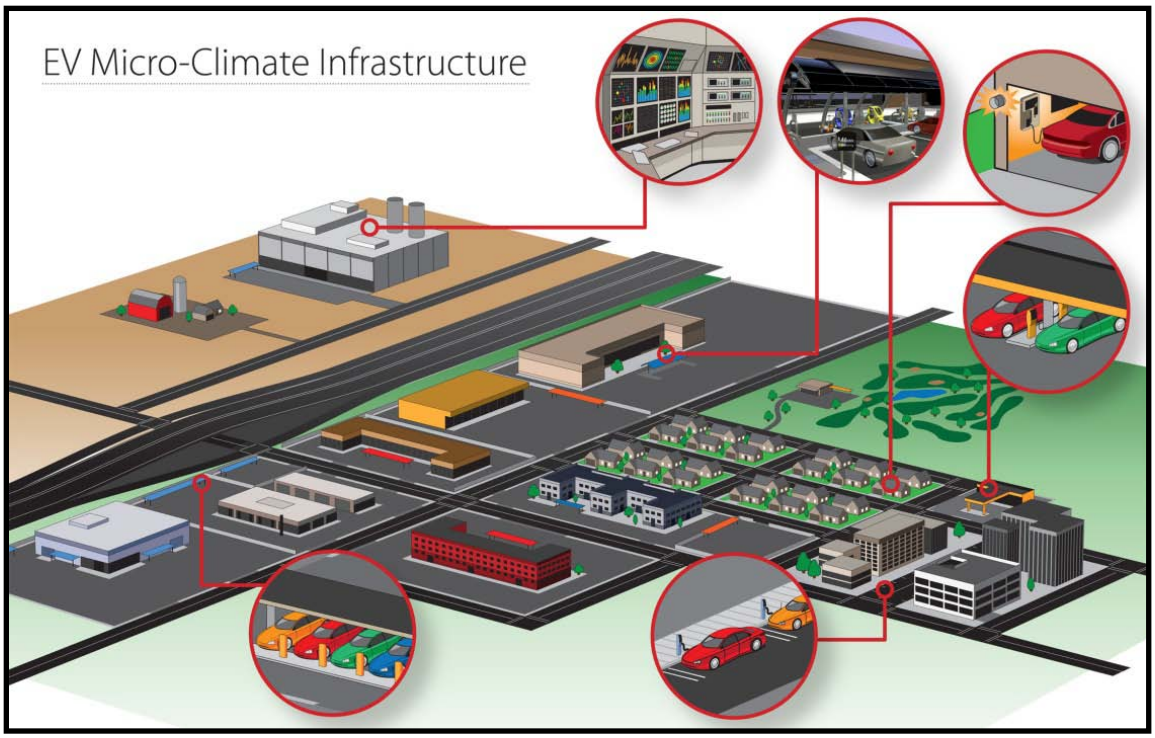
EV Micro-Climate™ Plan
for
Northwestern Oregon



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Acronyms

BEV Battery Electric Vehicle - vehicle powered 100% by the battery energy storage system available on board the vehicle.

EV Electric Vehicle

EREV Extended Range Electric Vehicle – see PHEV

EVSE Electric Vehicle Supply Equipment – equipment that provides for the transfer of energy between electric utility power and an electric vehicle.

OEM Original Equipment Manufacturer – In this document, this term refers to automobile manufacturers.

PHEV Plug-in Hybrid Electric Vehicle – vehicle utilizing both a battery and an internal combustion engine (ICE) powered by either gasoline or diesel.

REEV Range Extended Electric Vehicle – see PHEV.

1 Introduction

There is significant excitement in anticipation of the market availability of grid-connected vehicles beginning in 2010. Although, several automotive companies are projecting deployment of their vehicles across the United States, no appreciable charging infrastructure exists to support these vehicles.

The EV Micro-Climate™ program is an integrated turn-key program that advances select areas for the adoption of electric transportation. Beginning with extensive feasibility and infrastructure planning studies, the program provides a blueprint for a comprehensive Electric Vehicle (EV) infrastructure system and provides detailed action plans for its successful execution and continued maintenance.

On August 5, 2009, ECOtality NA was awarded a $99.8 million grant from the U.S. Department of Energy (DOE) to embark on The EV Project. The matching cost share from ECOtality NA and its partners provides a total project budget of $199.6 million. In June 2010, the DOE expanded The EV Project to include another automotive manufacturer and additional locations, for a total project budget of approximately $230 million.

ECOtality NA is partnering with Nissan North America, General Motors, and several other companies to deploy up to 5,700 zero-emission EVs (the Nissan LEAF), 2,600 Extended Range Electric Vehicles (EREV) (the Chevrolet Volt), and 13,000 - 15,000 charging systems to support them. These charging systems will be deployed in strategic markets in six states: Arizona, California, Oregon, Tennessee, Texas, and Washington, as well as the District of Columbia.

The EV Project will collect and analyze data to characterize vehicle use in diverse topographic and climatic conditions, evaluate the effectiveness of charge infrastructure, and conduct trials of various revenue systems for commercial and public charge infrastructure. The ultimate goal of The EV Project is to take the lessons learned from the deployment of these first 8,300 EVs, and the charging infrastructure supporting them, to enable the streamlined deployment of the next five million EVs.

The EV Project provides a starting point in Western Oregon to achieve the region's long-range goals. It cannot by itself complete the necessary infrastructure, but the long-range plan will provide the guidance for planning this infrastructure growth and focusing on the near term for locating EV Project resources.

ECOtality developed the EV Micro-Climate as an integrated program to ensure an area is well equipped with the needed infrastructure to support the consumer adoption of electric transportation. Beginning with extensive feasibility and infrastructure planning studies, the program provides a blueprint to create a rich EV infrastructure. The program is developed with

stakeholders including governmental organizations and jurisdictions, non-profit organizations, utilities, private-sector businesses, and automotive manufacturers.

ECOtality introduced the EV Micro-Climate™ process in Oregon in January 2010 with its first Oregon Advisory Team meeting. The process has three main deliverables:

- Deployment Guidelines
- Long Range Plan
- EV Micro-Climate Plan

1.1 Deployment Guidelines

The report entitled *Electric Vehicle Charging Infrastructure Deployment Guidelines for the Oregon I-5 Metro Areas of Portland, Salem, Corvallis and Eugene* was completed in April 2010. The Guidelines are intended to create a common knowledge base of EV requirements for stakeholders involved in the development of EV charging infrastructure. Electric vehicles have unique requirements that differ from internal combustion engine vehicles, and many stakeholders are currently not familiar with these requirements. Deployment Guidelines develop a foundation for implementation of EV charging infrastructure including topics such as information on technology, charging scenarios, codes and standards, and utility integration. Oregon Department of Transportation, the Oregon Building Codes Division, and many other Oregon stakeholders contributed content and also proactively set in motion procedural changes that will expedite deployment of Electric Vehicle Supply Equipment (EVSE).

1.2 Long Range Plan

The *Long-Range EV Infrastructure Plan for Western Oregon*, completed in August 2010, creates a long-term look toward a mature EV market and the implications for successful development of public charging infrastructure. The Plan provides a review of the current behavior of vehicle operators and industry projections of EV sales as a means of understanding the expected EV population in the Western Oregon area by the year 2020.

The Long Range Plan describes the unfolding EV technology and the needed EV charging support infrastructure. Electric Vehicles (EVs) are set to achieve significant market share within the next 10 years. Conservative estimates show that Western Oregon is likely to have over 73,000 electric vehicles on the road by 2020. To provide a convenient, mature charging infrastructure that encourages adoption and regular use of EVs, ECOtality projects that over 105,000 publicly available EVSE should be installed in Western Oregon by 2020.

The Long Range Plan shows maps of density and distribution patterns for both Level 2 and DC Fast Charging infrastructures. These maps were developed as part of the EV Micro-Climate Plan effort and are more fully described in this document.

1.3 EV Micro-Climate Plan

The long range plan is used as a starting point to develop the near-term strategy for infrastructure deployment and provides a basis for the direction of future deployment. The EV Micro-Climate Plan considers the first few years of this long range plan along with available local resources to develop a specific location-driven approach to the EV infrastructure. It takes projections from the long range plan to predict the EV penetration and EVSE needs to support that penetration in the very near future. Most automotive manufacturers have announced plans for plug-in vehicles and over the next ten years it is projected that there will be vehicles that will appeal to all demographic profiles. However, that may not be the case for the initial years of EV penetration. Rather than blanket the area with infrastructure, this plan looks at the demographics of the likely innovators and early adopters of EVs to provide the rich EV infrastructure that will continue to encourage the adoption of EVs.

The objective of this plan is to narrow into specific geographic locations for the placement of publicly-available Level 2 and DC Fast-Charge EVSE infrastructures. The purpose of this document is to record the process used by The EV Project for distributing, locating, and selecting EVSE sites. An important output of this document is a series of maps of potential geographic locations for publicly-available Level 2 EVSE and DC Fast Charge equipment. This Plan will be used in selecting specific EVSE hosts, leading to contracts and EVSE installations.

2 Two-Year Planning Horizon: the EV Micro-Climate Plan

Most recharging of electric vehicles will occur overnight at the owner's residence. However, studies of consumer attitudes towards electric vehicles point to the need for publicly-available charging stations to make the transition to electric transportation successful.

> "Even though EVs meet the daily range requirements of most drivers, range anxiety is pervasive. Customers want to be able to charge at home and have the convenience of rapid charging stations (i.e., have the same experience as buying gas)." [1]

Beginning in 2011, EVs will be on the roads in Oregon and will need publicly-available EVSE. In terms of numbers, most EVs entering Oregon in 2011 will be Nissan LEAFs, which is the primary vehicle being supported by The EV Project. By late 2011 and 2012, many other manufacturers are expected to deliver vehicles to Oregon that will also be able to use the J1772™ connector associated with Level 2 charging. A more limited number of vehicles will be equipped to utilize the DC Fast Charge units, because no U.S. national standard has been adopted for this charging level.

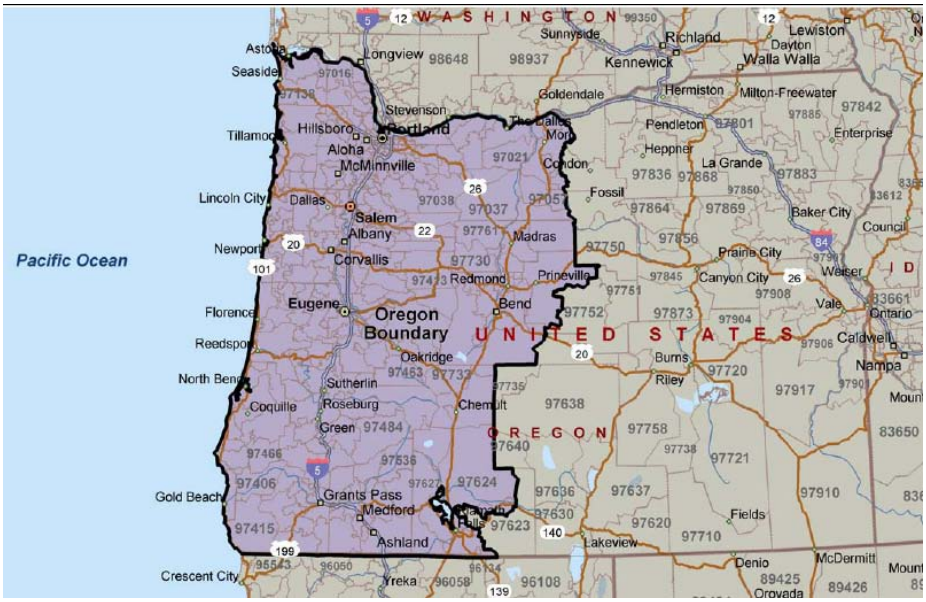

Figure 2-1: Western Oregon Long Range Plan Boundary

[1] Deloitte Research, *Gaining Traction, A Customer View of Electric Vehicle Mass Adoption in the US Automotive Market*, January 2010

Figure 2-1 illustrates the boundary of the Long Range Plan. Because the Micro-Climate plan focuses on the near-term expected deployment of EVs and EVSE, the boundary is reduced. Figure 2-2 illustrates the boundary of the nearer-term Micro-Climate Plan.

Figure 2-2: Northwestern Oregon Micro-Climate Plan Boundary

In 2011, Nissan is estimating the LEAF market strength to be at least 900 vehicles. The EV Project is planning to install that number of Level 2 residential and fleet EVSE. The EV Project is also targeting to install a proportional number (approximately 1,000) publicly-available Level 2 charging stations and 23 DC Fast Charge stations (with two connectors each) within the Micro-Climate boundary. While other OEMs and EVSE suppliers have announced plans to deploy EVs and EVSE, no definitive numbers have been provided.

3 EV Micro-Climate Planning

3.1 Process Overview

Using Deployment Guidelines and the Long Range Plan as context, ECOtality has developed a Micro-Climate Plan for the Northwestern Oregon. The Micro-Climate Plan provides geographic mapping that relies on:

- Analysis of available data sets obtained from Geographic Information Systems (GIS) at State, regional, and local governments, and
- Stakeholder-derived recommendations for locating EV infrastructure.

The near-term distribution of EVSE requires a planning process that increasingly focuses at a city and neighborhood level. For the two-year planning horizon, ECOtality has heavily relied on city data and advice on locating infrastructure in their communities because of their expertise within their own communities.

3.2 Density and Distribution Mapping for EVSE

As part of the Micro-Climate Planning process, ECOtality and its partners produced detailed density and distribution mapping for the urban areas in the Willamette Valley (Appendix A). This mapping will serve as a tool to guide EVSE site selection and help determine the appropriate number of units at the selected sites.

The Oregon Department of Transportation (ODOT), ECOtality, and other stakeholders conducted a data search of state, regional, and local data that could be useful in locating EVSE. Initial inquiries included four types of data:

- Special traffic generators and/or points of interest identified by cities
- Traffic volumes (state and local)
- Employment location information by industry type
- Zoning classifications from cities

Of these data sources, Traffic generators and points of interest were dropped from the analysis. This is because of the high degree of variability of the data between cities. Some cities delivered very detailed information and other cities had no contributing information.

Therefore, the analysis proceeded with GIS data for zoning, employment (by location and type), and travel patterns. To create the density and distribution mapping, ECOtality used the three categories to create multiple data layers and associated values mapping. A combined, single map was then produced to show proposed density and distribution patterns for EVSE by using multivariate analysis.

3.2.1 Zoning

The underlying land use zoning of each property gives us a good idea of the type of use that is likely to be occurring on that property. Based on the criteria set for each zone in the codes, we can make assumptions about whether use of the properties can support a good site for publicly available EVSE.

Each participating jurisdiction sent zoning data to ODOT for compilation. Because each jurisdiction has developed its own unique system of zoning classification, the analyst needed to use judgment to compare classifications across jurisdictions. This was done by normalizing the zoning classifications into four categories (from high (1) to very low (4)) based on how the land use supports or does not support publicly accessible EV charging. As an example, zoning categories representing regional retail uses received a "high" rating, while at the other end of the spectrum, zoning categories for heavy industrial or rural residential received a "very low" rating. These four categories were assigned for all zones in the urban areas.

3.2.2 Employment Data

Using employment data gathered by governmental entities, we can determine the type of employment undertaken in different neighborhoods and focus on employment types associated with destinations that would support usage of publicly available EVSE. Employment information used for this planning effort sorted the type and number of employees traveling to transportation analysis zones (TAZs).

Two sources of data were used: Portland Metro (for Metro area only) and Oregon Statewide Integrated Model Industry Code data. While the statewide data covered the entire study area, analysts chose to substitute Metro data within the metropolitan area because it was gathered much more recently than the statewide data and is therefore more accurate.

Each TAZ contains employees from numerous categories, so the number of employees was normalized according to three ranks. Judgment was used to compare and rank metro's nine categories with the 39 categories available in the state database.

As an example of how the analyst developed the ranking, employees working in service or retail trade received a high rank (category 1), while employees from the agriculture and forestry trades received a low rank (category 3). Numerical values derived from the ranks are as follows:

- Category 1 received a value of twice the number of employees.
- Category 2 received a value equal to the number of employees.
- Category 3 received a value equal to half the number of employees.

These values were then distributed into the TAZs.

3.2.3 Travel Patterns

Destinations important for EVSE charging are often located near busy streets and highways. Analysts considered the relationship of high traffic to surrounding properties. Two sources of information were used to construct the travel data layer for this analysis:

- Average Daily Traffic (ADT) on major arterials larger than two lanes in each direction.
- Interchange locations along limited access highways.

Major arterials larger than two lanes were buffered 660 feet on each side of centerline and received the following scores:

- High: >36,000 Average daily traffic (ADT)
- Medium: 20,000 to 36,000 ADT
- Low: <20,000 ADT

Freeways, regardless of ADT, were eliminated from the database except at interchanges because of their limited access to adjacent property. Interchange locations with access to local property received a 1,320-foot buffer and a high score on this data layer.

3.2.4 Multivariate Analysis

Multivariate analysis is a structured approach to use data and value judgments about that data to help reach decisions. This study conducted multivariate analysis using zoning, employment, and travel data.

After preparing the maps, ECOtality and members of the Advisory Team reviewed the maps for anomalies, places where the gathered data did not reflect current conditions. Several adjustments were made. As an example, a regional retail shopping area was developed east of the Portland Airport on previously undeveloped land; data sources we used did not adequately capture this change.

3.2.5 Nissan Registrants Compared to Population Distribution

One question that arose during Micro-Climate planning was how do registration rates for the Nissan LEAF correlate with general population? At the macro level – looking across the Willamette Valley study area, we see relatively minor variations between population and registrants, as shown in Table 3-2 below, which is based on data from August 2010.

Table 3-1: Nissan LEAF Registrants Compared to Metropolitan Area Population

Metropolitan Area	Population	Number of LEAF Registrants	Percentage within Study	
			Population	Nissan Leaf Registrants
Corvallis/Albany	112,000	45	6%	9%

Eugene/Springfield	226,030	38	11%	8%
Portland Area	1,462,300	375	72%	77%
Salem/Keizer	228,270	27	11%	6%

However, patterning within metropolitan areas is rather strong, as shown in Table 3-2.

Table 3-2: Nissan LEAF Registrants, by City

For Willamette Valley as of August 10, 2010

Metro Area	City	Number of LEAFS	Ratio of City to Metro Area
Eugene-Springfield	CRESWELL	1	2.63%
	EUGENE	33	86.84%
	PLEASANT HILL	2	5.26%
	SPRINGFIELD	2	5.26%
Eugene-Springfield Total		38	
Corvallis-Albany	ALBANY	3	6.67%
	CORVALLIS	33	73.33%
	MONMOUTH	2	4.44%
	PHILOMATH	6	13.33%
	SHEDD	1	2.22%
Corvallis-Albany Total		45	
Portland	ALOHA	1	0.27%
	BEAVERCREEK	1	0.27%
	BEAVERTON	42	11.20%
	BORING	2	0.53%
	CLACKAMAS	3	0.80%
	CORNELIUS	2	0.53%
	DAMASCUS	4	1.07%
	FAIRVIEW	1	0.27%
	GLADSTONE	1	0.27%
	GRESHAM	2	0.53%
	HAPPY VALLEY	7	1.87%
	HILLSBORO	26	6.93%
	LAKE OSWEGO	26	6.93%
	MILWAUKIE	2	0.53%
	NEWBERG	5	1.33%
	OREGON CITY	8	2.13%
	PORTLAND	204	54.40%
	SANDY	3	0.80%
	SHERWOOD	6	1.60%
	TIGARD	7	1.87%

	TROUTDALE	1	0.27%
	TUALATIN	7	1.87%
	WEST LINN	11	2.93%
	WILSONVILLE	3	0.80%
Portland Total		375	
Salem & North Valley	AURORA	1	3.70%
	CANBY	1	3.70%
	DUNDEE	1	3.70%
	HUBBARD	2	7.41%
	KEIZER	1	3.70%
	RICKREALL	1	3.70%
	SALEM	19	70.37%
	TURNER	1	3.70%
Salem & North Valley Total		27	

Figure 3-1 shows registrants as a percentage of population for selected cities.

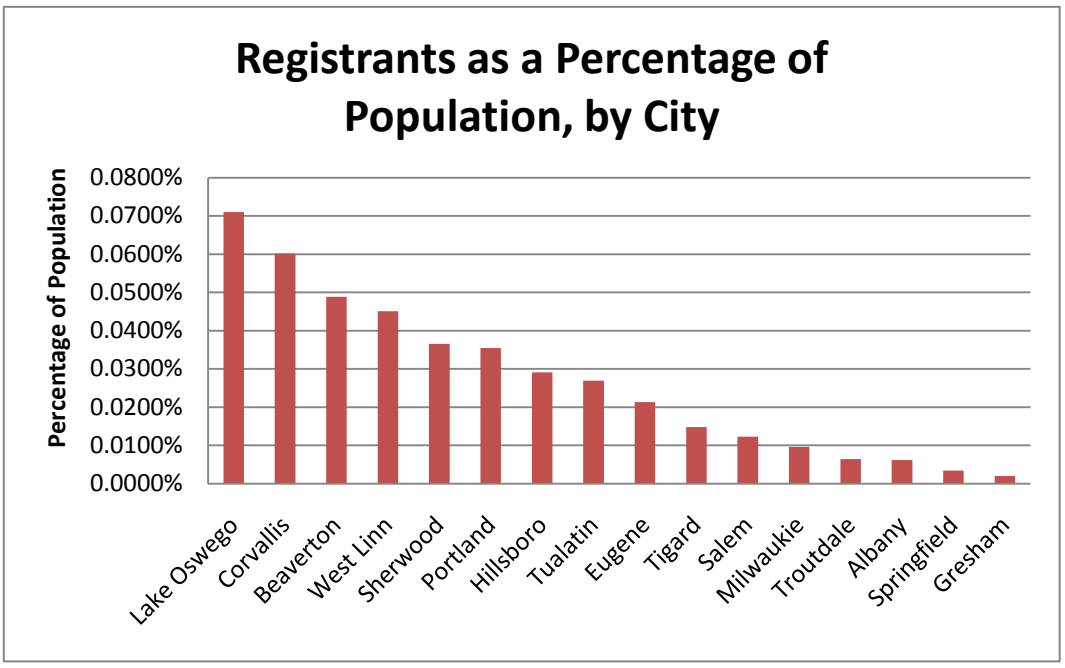

Figure 3-1: Nissan Leaf Registrants, by City

Based on the August 2010 data, Lake Oswego, Corvallis, and Beaverton have percentages of registrants greater than one standard deviation above the mean, and Springfield and Gresham have percentages lower than one standard deviation. To some extent, these statistics should be considered during distribution of The EV Project's publicly-available EVSE. However, where a LEAF owner resides does not mean that is where that driver will want or need publicly-available EVSE.

ECOtality needs to pair registration data with information on regional destinations related to jobs, recreation, cultural events, education, and other attractors. ECOtality considered using origin-destination travel information to help determine destinations that may be attributed to the location of the registrants, but traffic modeling experts advising the project recommended against this approach because the data currently available for our study area includes household survey data that is approximately 15 years old. (It is currently being updated).

In Oregon, we have relied on the Density and Distribution mapping and also stakeholder input to identify destinations. The Micro-Climate process includes tools to help locate EVSE that feature both data-driven inputs and community-requested locations.

3.2.6 Stakeholder Input for Locating EVSE

ECOtality has gathered requests and advice on locating EVSE from a variety of sources. Our team will utilize this input as we consider opportunities presented by property owners willing to host publicly-available EVSE.

3.2.7 Methods

- Community-based outreach has been the basis for creating a Nominated Locations Map, which is discussed later in Section 3.4.2. Meetings were scheduled throughout the Willamette Valley. The meetings were attended by city and county staff and other community members. Participants were asked to consider the following EV-Project parameters when nominating locations:
    - Focus on general locations (mapped as 1/4-mile circles) rather than specific properties.
    - Consider locations where people regularly gather for shopping, recreation, cultural events, or business.
    - Find places where publicly-available charging is likely to occur for about 1 to 3 hours.
    - Determine sites where the community would likely benefit from having publicly-available EVSE.

  Most of the activity centered on Level 2 EVSE, but a few cities also nominated sites for Fast Chargers. Many communities provided information on which locations were likely to be of highest importance.

Participants drew their ideas on maps, which were then entered into an ECOtality map for the entire study area showing community-based nominations (as ¼-mile circles). ECOtality is using this map to help match specific site opportunities with community input.

Continuing through Fall and Winter 2010/2011, many jurisdictions are helping to identify specific host sites on both public and private property.

- Advisory Team members have nominated, and continue to bring potential locations and sites to the attention of ECOtality. Advisory Team members are also hosting meetings to bring together potential hosts with ECOtality staff. PGE has a web link to ECOtality to assist potential hosts in contacting ECOtality about locating EVSE. Nominations from Advisory Team members are entered into ECOtality's CRM database.

- ECOtality Stakeholder Meetings were held in April 2010 and forms distributed to solicit potential EVSE sites.

- Media Outreach through newspapers has requested site nominations and ECOtality has received about 50 responses as a result. These ideas have been entered into ECOtality's CRM database.

- EV Project Web Portal links give visitors two ways to participate in locating EVSE – first, by nominating a site on a map of the Oregon area, and also through the ability to leave a message for ECOtality. Ideas emailed to the EV Project Web Portal have been entered into ECOtality's CRM database.

3.2.8 Results

The following local jurisdictions have participated with ECOtality to help locate publicly-accessible EVSE in places important to their communities. The cities and counties listed below sponsored a special meeting for The EV Project:

- Albany
- Beaverton
- Clackamas County
- Corvallis
- Gresham
- Eugene
- Fairview
- Hillsboro
- Keizer
- Multnomah County
- Oregon City

- Portland
- Salem
- Sherwood
- Springfield
- Lake Oswego
- Newberg
- Milwaukie
- Tigard
- West Linn
- Wilsonville

Staff from the following additional communities has contacted ECOtality to provide EVSE location ideas and/or has attended a meeting sponsored by ECOtality where location input was requested:

- Adair Village
- Benton County
- Banks
- Forest Grove
- Independence
- Linn County
- Marion County
- Philomath
- Newberg
- Troutdale
- Washington County

Community-based outreach resulted in hundreds of locations nominated in the urban areas. These areas are expressed as ¼-mile circles on the figures shown in Appendix A. No effort was made to limit or subsequently edit the number of locations selected at these meetings, so the number and density of nominated sites varies from jurisdiction to jurisdiction.

Site nominations gathered through the Advisory Team and through stakeholders' direct contact with ECOtality are being entered into a customer relationship management (CRM) database. In acting on these site nominations, ECOtality staff reviews both the density and distribution mapping for EVSE as well as locations nominated by local jurisdictions.

3.2.9 National Accounts

ECOtality is developing national accounts to help distribute EVSE. National accounts are corporations and other organizations that have suitable properties for locating EVSE in more than one state. Many of the areas identified on the Nominated Locations will align with locations of properties in ECOtality's national accounts database.

4 Plan for Convenience (Level 2) EVSE

ECOtality will be collecting data from participating vehicle owners both at their home chargers and at publicly-available EVSE. A vast majority of the EVSE will be Convenience (Level 2) EVSE.

Most publicly-available EVSE will be placed within four metropolitan areas: Portland, Salem/Keizer, Corvallis/Albany, and Eugene/Springfield. Target allocations of Level 2 EVSE for these communities, which are detailed within Section 4, are summarized in Table 4-1.

Table 4-1: Locations for Deployment of Convenience Chargers per Metropolitan Area

Year	Greater Portland	Salem Keizer	Corvallis Albany	Eugene Springfield	Other	Total
2011	665	105	75	105	200	1,150

Destinations that attract the public will be the primary focus, as identified by the local jurisdictions, other stakeholders, and ECOtality.

4.1 EVSE located on Public Property

ECOtality plans to allocate about 150 publicly-available convenience EVSE (level 2) on public property including publicly-owned parking lots, parking structures, and on right-of-way. Locations will include community colleges, city halls, libraries, state offices, state colleges, and other locations as nominated by the local jurisdictions, the Advisory Team, and others.

If these EVSE are distributed according to population, the distribution would be:

1. Portland Area 108
2. Salem/Keizer 17
3. Corvallis/Albany 8
4. Eugene/Springfield 17

This distribution does not consider centers of government as destinations. Albany, Corvallis, Portland, Eugene, and Salem are all county seats, plus Salem is also the state capitol and headquarters for most state departments.

Following Advisory Team review, ECOtality modified the target distribution of convenience EVSE located on public property to be as follows:

1. Portland Area 95
2. Salem/Keizer 20
3. Corvallis/Albany 15
4. Eugene/Springfield 20

4.2 Convenience EVSE located on Commercial Property

ECOtality plans to allocate approximately 1000 Convenience EVSE on commercial property in Oregon. Allocation of these EVSE is planned as follows:

- About 80% within or near cities in the Willamette Valley as rich infrastructure
- About 20% as safety net locations:
    - Small communities within and fringing the Willamette Valley
    - Unincorporated areas with destinations
    - Oregon Coast locations west of the Willamette Valley
    - Rogue Valley urban centers of Medford and Ashland
    - Others as requested from EV Project participants

Relative population numbers for the metropolitan areas of the Willamette Valley suggest distribution of the number of convenience EVSE as shown in Figure 4-1:

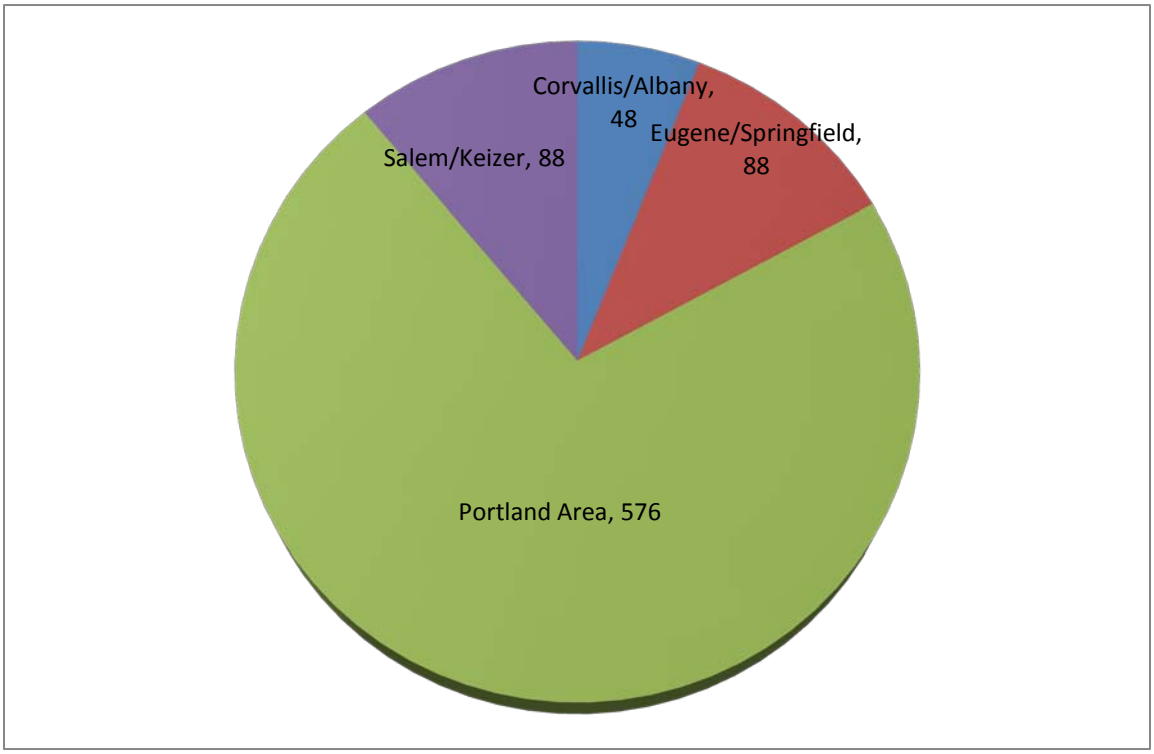

Figure 4-1: Convenience EVSE Distribution within Cities

Within the metropolitan areas, other factors besides population affect distribution of allocations. The proportion of EV Project registrants compared to population will influence distribution in those communities that are more than one standard deviation from the mean:

- Lake Oswego, Corvallis, and Beaverton have very high levels of registration.
- Gresham and Springfield have very low levels of registration.

The Advisory Team supported having the Corvallis/Albany metropolitan area receive a higher proportion based on that area's high number of Nissan LEAF registrants. Therefore, the target distribution of EVSE at commercial property locations for these four metropolitan areas will be:

1.	Portland Area	570
2.	Salem/Keizer	85
3.	Corvallis/Albany	60
4.	Eugene/Springfield	85

4.3 Selection of Sites for Convenience (Level 2) EVSE

ECOtality will select sites for convenience charging using allocations identified in sections 4.1 and 4.2. Sites are nominated either through stakeholder involvement collected into ECOtality's CRM database, national accounts, or by staff referencing the Density and Distribution Map and the Community Nominations Map.

To be selected, sites should meet the following criteria:

- Likely to meet EV Project data collection requirements
- Supported by the property owner
- Cost-effective
- Safe for the equipment and the user
- Consistent with the Density and Distribution Map and/or the Community Nominations Map

5 DC Fast Charge Plan

Under The EV Project, it is estimated that 25 DC fast chargers with two ports each will be deployed in Oregon. Selection criteria for locating DC fast chargers takes into account the criteria listed above in Section 4.3 as well as actual site suitability for DC fast chargers depends much more upon the electric grid capability.

The network of DC fast chargers will offer EV drivers more diverse ability to conduct longer trips on major roads through Western Oregon – including I-5, the key link for urban areas in the Willamette Valley. ECOtality is coordinating with State-sponsored efforts in both Oregon and Washington to provide EVSE along I-5 from Oregon's California border to Vancouver BC. While this Micro-Climate Plan includes that portion of I-5 from Portland to Eugene that will be serviced by The EV Project, additional DC fast chargers will be added from Eugene to Ashland to complete the system.

Fast chargers will also be utilized within the metropolitan areas to support high-mileage uses, such as taxis and delivery services.

DC fast chargers will be placed at locations where drivers can be comfortable and would want to spend from 10 to 30 minutes while their car is charging.

Targeted locations for DC fast chargers in Northwestern Oregon concentrate in the populated Willamette Valley, but also include safety net sites on highways that provide access to the Oregon Coast.

Nearby access to a freeway or state highway is an important consideration for selecting sites for DC fast chargers. According to the Long Range Plan, corridor travel should be supported by DC fast chargers located at intervals of 30 miles or less. For the initial rollout of DC fast chargers, the actual spacing will be greater on the rural corridors – but still well within the range of a Nissan LEAF.

DC fast chargers will be distributed in the Portland area at much closer intervals to help support the large population and diverse trip purposes. The plan for the Portland area includes support for programs that reduce congestion and air pollution, such as the electrification of car sharing, taxi services, and distribution of goods.

Stakeholders and potential hosts nominated sites for fast chargers and these ideas helped identify locations for DC fast chargers.

Target allocations for DC fast Chargers are shown on Table 5-1 below.

Table 5-1: Allocations for Deployment of DC Fast Chargers per Metropolitan Area

Year	Greater Portland	Salem Keizer	Corvallis Albany	Eugene Springfield	Other	Total
2011	15	2	2	2	4	25

Figure 5-1 highlights targeted locations for DC fast chargers in Northwestern Oregon. The map includes input from diverse stakeholders and review by the Advisory Team. The highlighted red-colored triangles mark 25 locations that are the primary recommendations for charging station locations. The green-colored triangles represent additional locations recommended by members of the Advisory Team should more CD fast chargers become available within the next two years.

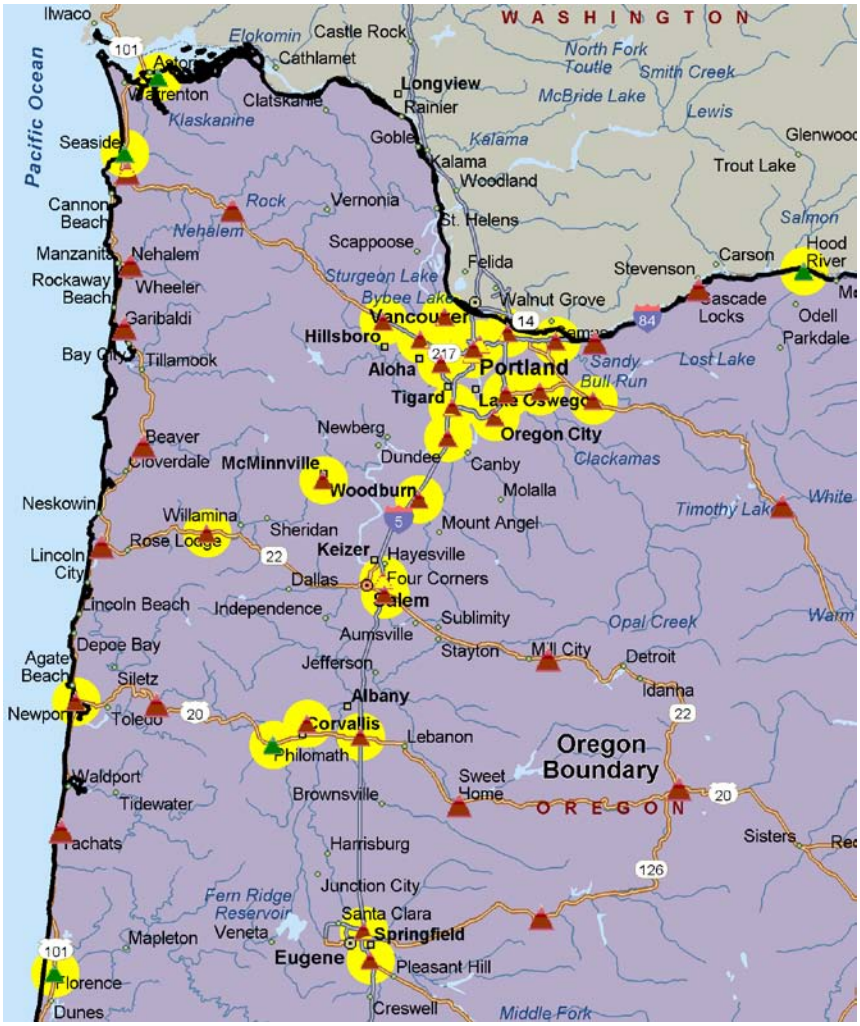

Figure 5-1: DC Fast Charger Location Plan

Appendix A – Density and Distribution Maps

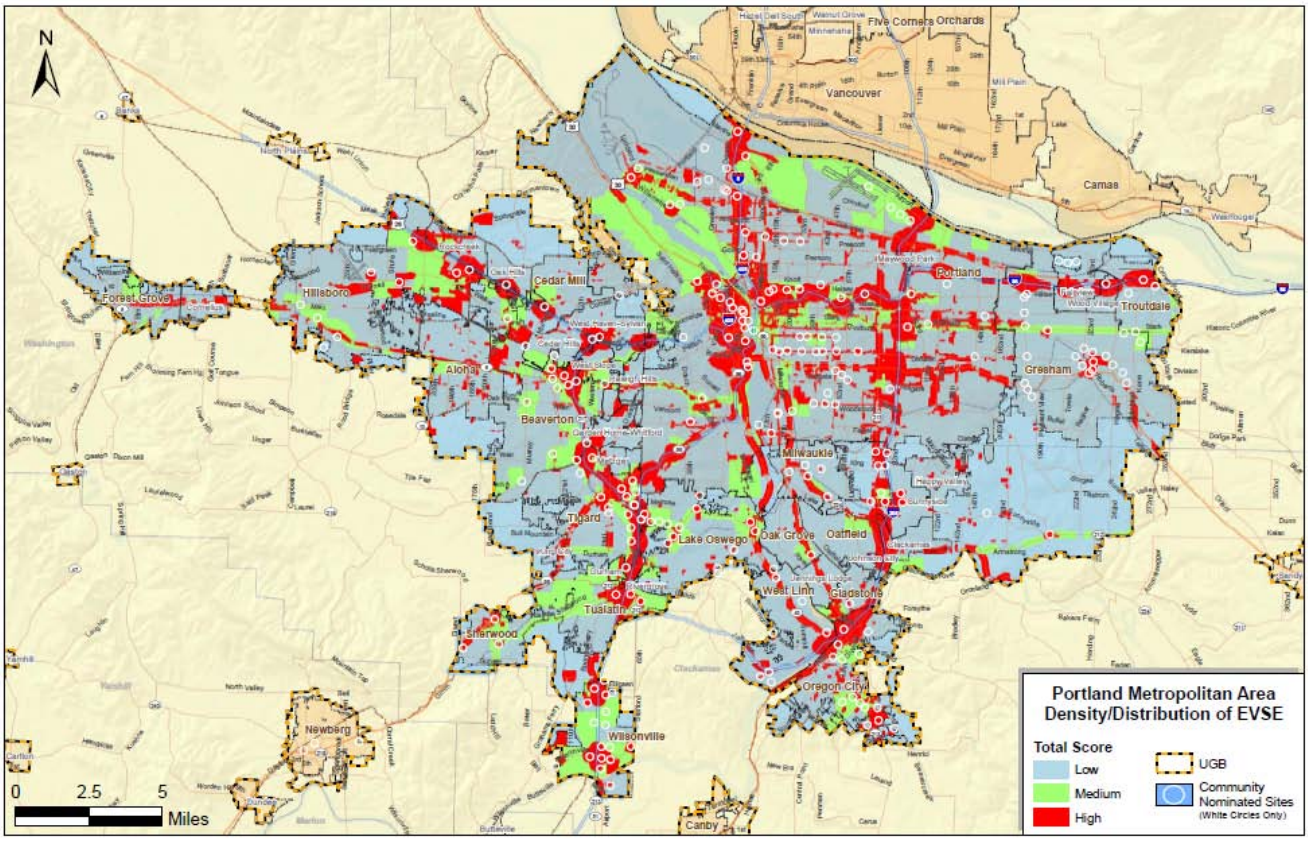

Figure A-1: Portland Metropolitan Area Density/Distribution of EVSE

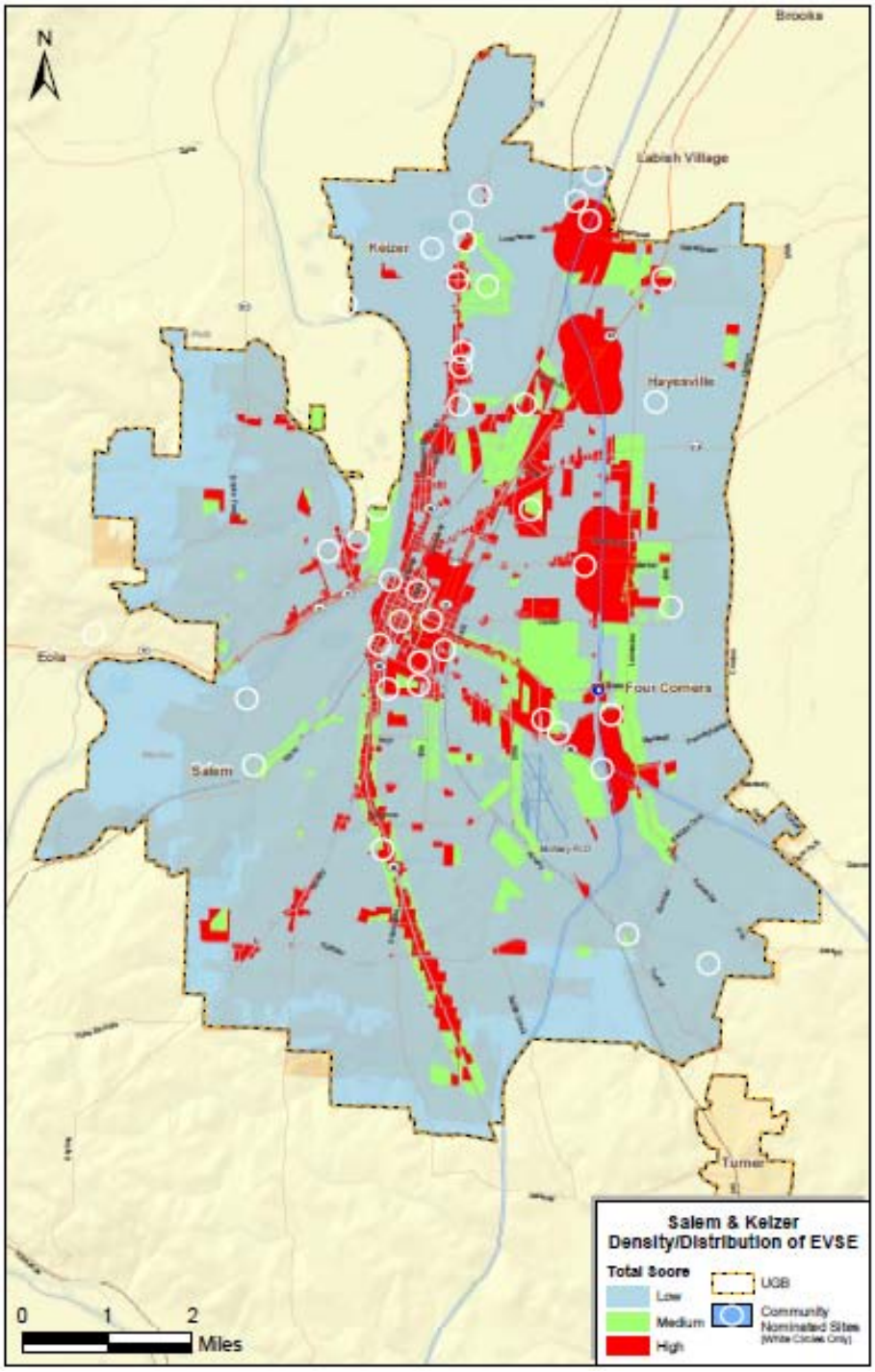

Figure A-2: Salem/Keizer Density/Distribution of EVSE

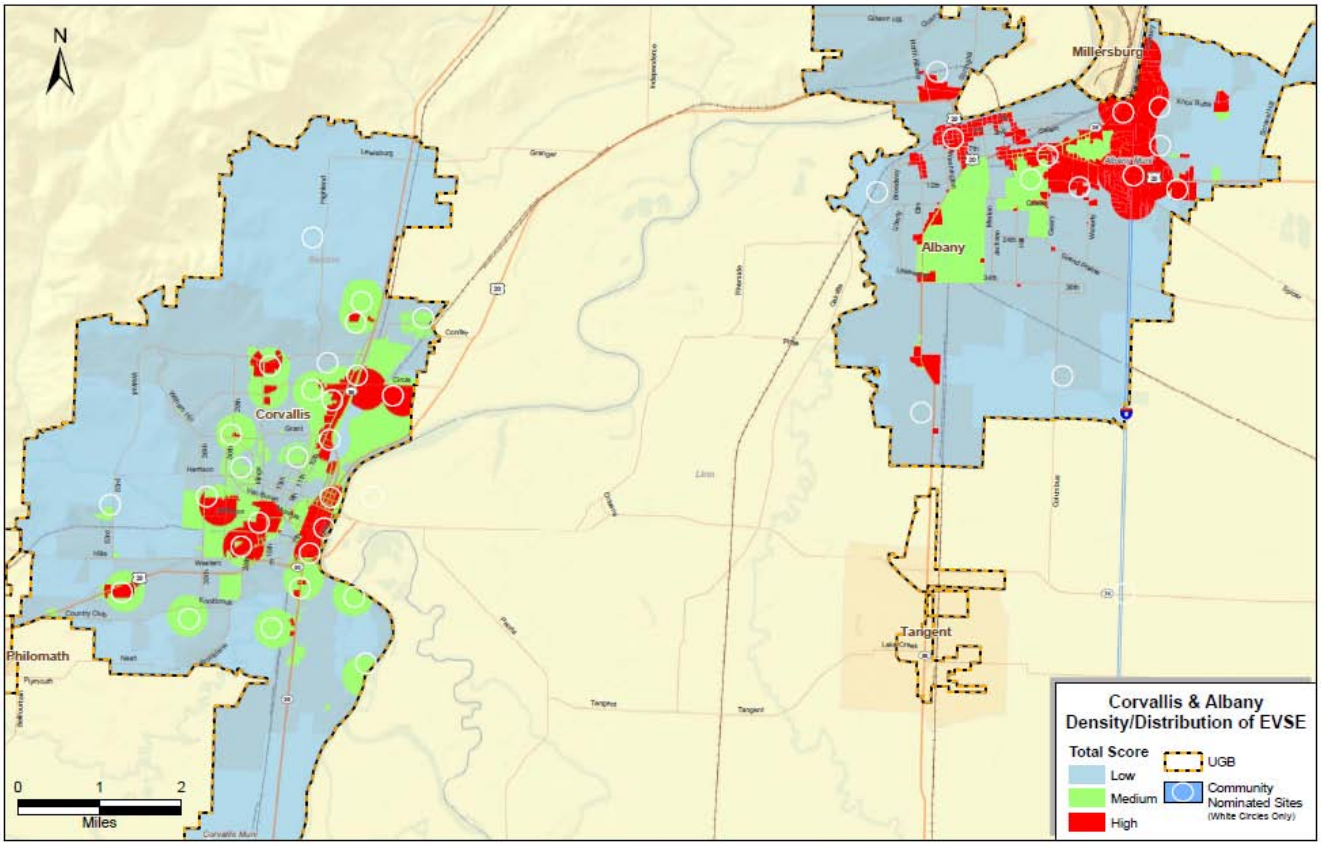

Figure A-3: Corvallis/Albany Density/Distribution of EVSE

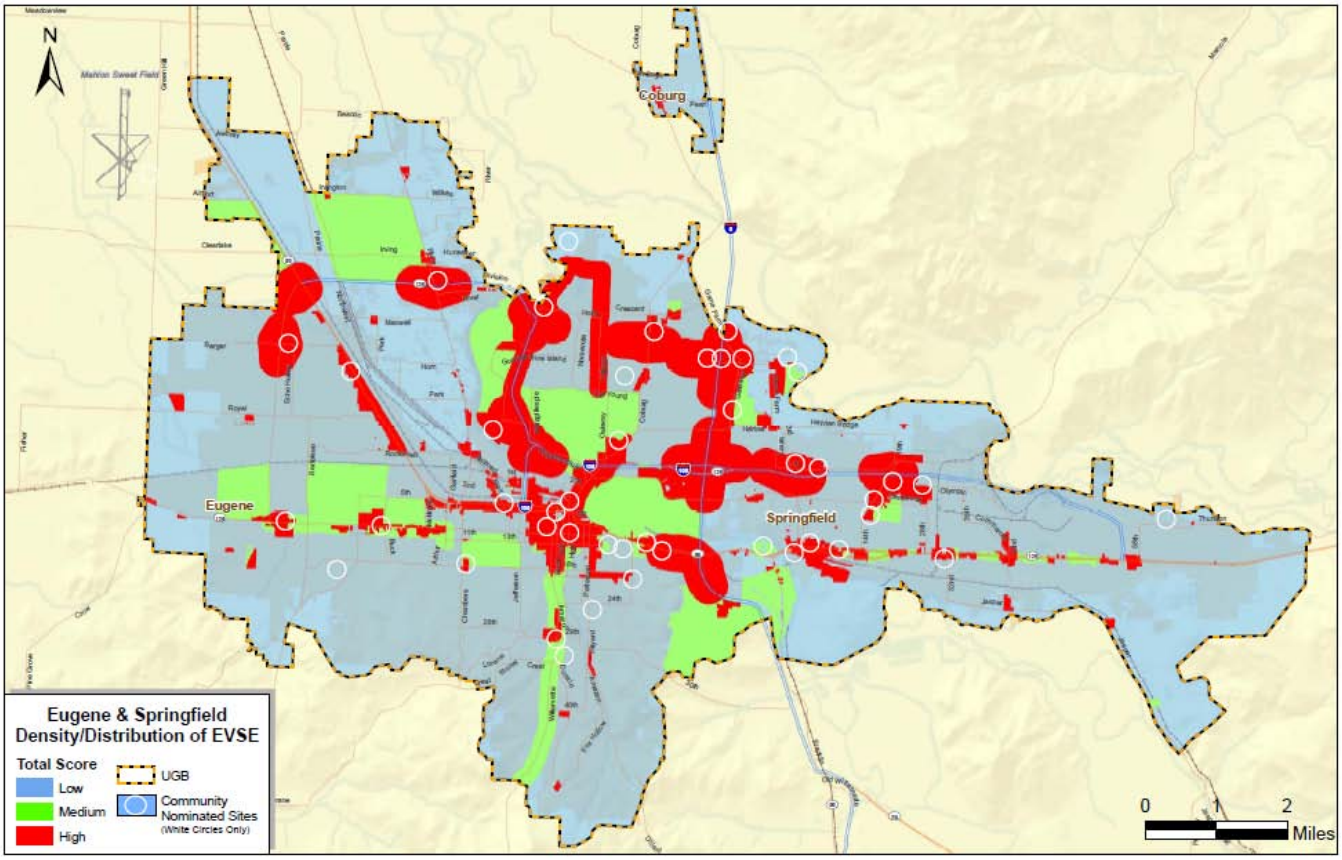

Figure A-4: Eugene/Springfield Density/Distribution of EVSE

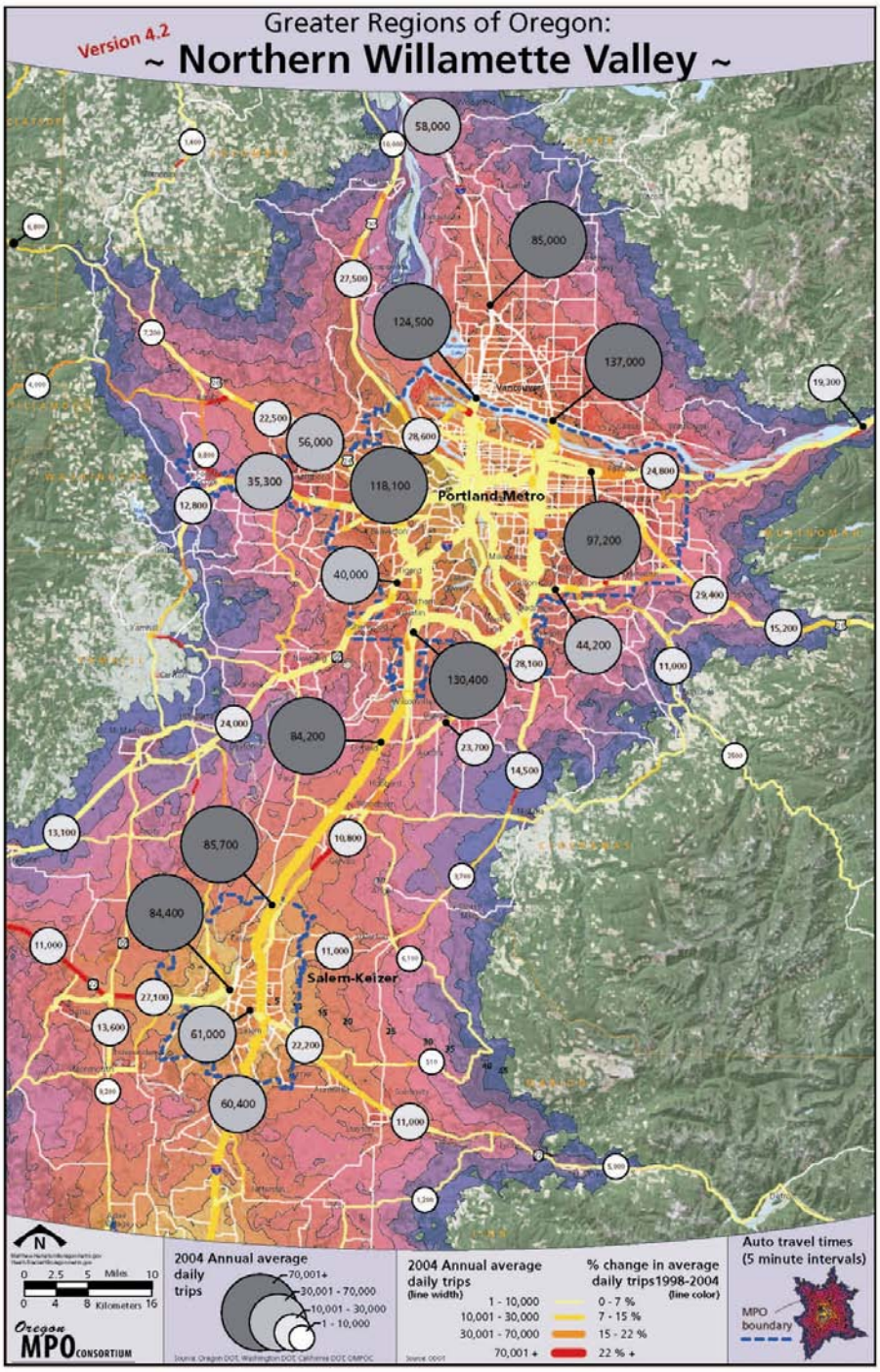

Figure A-5: Travel Statistics Northern Willamette Valley[2]

[2] Oregon MPO Consortium

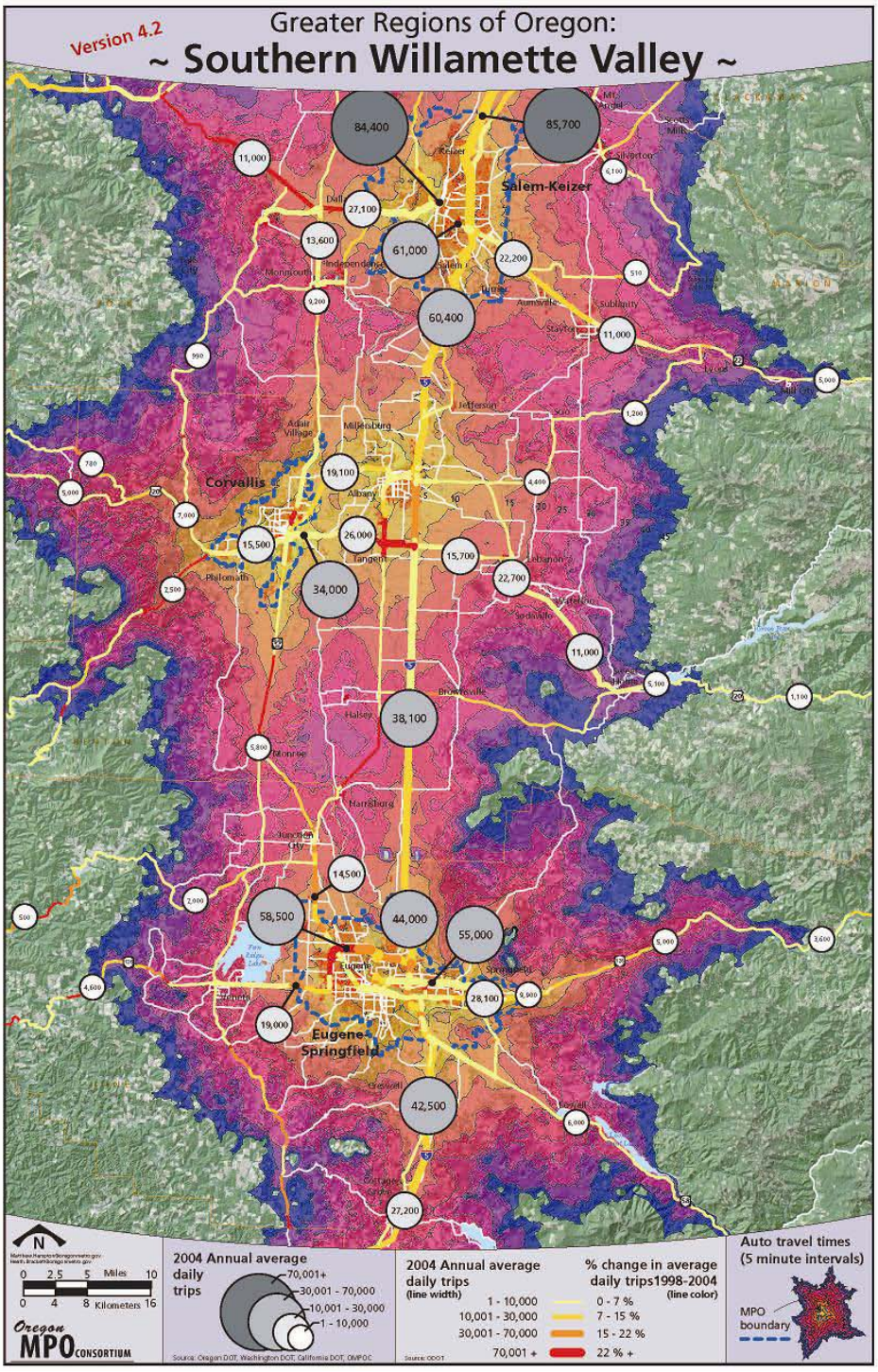

Figure A-6: Travel Statistics Southern Willamette Valley[3]

[3] Oregon MPO Consortium