

*EVS30 Symposium
Stuttgart, Germany, October 9 - 11, 2017*

Advancing Electric Mobility Through Public-Private Partnerships: The Oregon Case Study

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Executive Summary

The small northwestern state of Oregon, adjacent to California, has emerged as one of the world's leading "living laboratories" for electric mobility. This paper summarizes Oregon's progress and argues that the most important factor in its success has been an ability to forge strong public-private partnerships among many diverse stakeholders. The paper discusses how public-private partnerships have made Oregon, and increasingly the broader Pacific Northwest, a leading market for electric and advanced mobility, and explores future trends and implications for other regions.

Keywords: consumers, demonstration, market development, state government, strategy

1 The Electric Vehicle Market in the U.S. and Oregon

The past several years have seen dramatic disruption in the traditional automotive industry, and in the mobility industry more broadly. These changes rival anything seen in at least fifty years. Electric cars, which were barely available just five or six years ago, are now selling much better than hybrid vehicles did at this point in their product cycle.¹ Sales continue to grow, with July 2017 setting a new sales record for the 22nd consecutive month.² With battery prices continuing to drop, and increasing numbers of vehicles available, at least one analyst predicts that "...the 2020s will be the decade of the electric car."³

Moreover, these sales are not evenly distributed globally, or within the United States. Some states, and some specific communities within states, have virtually no electric vehicles registered. In other communities, 10% of new vehicles sold are electric. Oregon is in the 2-4% range, making it one of the highest per-capita sales markets in the country.⁴ This is clearly shown in Figure 1, from the International Council on Clean Transportation.⁵

While sales are growing, there is much further to go. Oregon is one of nine states that have adopted the Zero Emission Vehicle (ZEV) Mandate developed in California, which requires approximately 15 percent of new vehicle sales in 2025 to be zero-emission vehicles. Oregon has also joined other state and national governments in a more ambitious goal of having all new cars sold be zero-emission electric vehicles by 2050.⁶

Over the past decade, Oregon has also led efforts to develop per-mile car insurance policies and a per-mile road use charge to replace the state's gas tax.¹³ The city of Portland was the first U.S. city to adopt a greenhouse gas strategy, in 1993, and Oregon has been a leading state in this regard.

Oregon adopted California's stricter vehicle emissions standards and the ZEV mandate in 2006, and joined the International ZEV Alliance committing to a goal of all new car sales being electric by 2050.¹⁴ In 2016, Oregon passed legislation that doubles the state's Renewable Portfolio Standard to 50% and bans the sale of electricity produced by burning coal, while requiring electric utilities to develop plans to accelerate transportation electrification.¹⁵ In 2017, Oregon passed legislation creating rebates of up to \$2,500 for electric vehicles, with additional rebates for low income drivers.¹⁶

2.3 Early Adopter Market

Oregonians are technology savvy "early adopters," with many residents working in the "Silicon Forest" companies like Intel, Mentor Graphics, and others. When the first hybrid vehicles became available in the 1990s, Oregon quickly emerged as one of the leading markets, and it has continued to be a top market for hybrids to this day. More generally, Oregon is consistently ranked as one of the top states for clean technology, landing third behind California and Massachusetts in the U.S. Clean Tech Leadership Index.¹⁷ The city of Portland was ranked 4th among the top 50 metropolitan regions in the country.¹⁸ Oregon remains one of the top electric vehicle markets in the country on a per capita basis, and has seen strong growth in electric vehicle sales since 2011. This is even though, up until this year, Oregon lacked any state incentives, making Oregon an "unconventional success story" for electric mobility.¹⁹

2.4 "The Oregon Way"

Oregon has another advantage: the state enjoys strong working relationships among diverse stakeholders, and a general commitment to collegial working relationships even when disagreements arise. Public agencies, interest groups, and even competing companies tend to work together collaboratively more than in most parts of the country. In fact, the Oregon Legislature has funded and supported a substantial Oregon Consensus program designed to facilitate collaborative problem solving in the public policy realm.²⁰ We argue that this collaborative approach, and an emphasis on public-private partnerships, has been one of the most critical keys to the region's success.

3 Leadership Through Public-Private Partnerships

In 2011, the State of Oregon, through the Oregon Innovation Council, made an initial investment in Forth (then known as Drive Oregon,) a new public-private partnership designed to accelerate the growth of the electric vehicle industry. Over the following six years, the State of Oregon made cumulative total investments of just under USD \$3.5 million in Forth. These financial investments were paired with a commitment by Oregon's Governor and state agencies to work with Forth to advance the electric mobility industry. This public-private partnership has driven Oregon's emergence as a leading electric mobility hub in several ways.

3.1 Partnerships Yield Industry Growth

In 2012, Forth and the Portland Development Commission worked with the Northwest Economic Research Center at Portland State University to complete an economic analysis of Oregon's electric vehicle industry.²¹ That study conservatively estimated that the industry provided over 1,600 jobs and gross annual economic activity of over \$266 million. Between 2011 and 2016, Forth used state funding to provide highly leveraged funding to Oregon companies through its Matching Grant program. Overall, total grant awards of less than USD \$600,000 leveraged over USD \$26 million in additional investment into growing Oregon's electric vehicle industry. Forth itself has grown from a dozen member companies to well over 100.

Forth has also worked with diverse public and private partners to grow the industry by strengthening network connections among industry firms, and raising the visibility of the region globally. This has been accomplished through monthly industry networking events, and through coordinated participation by

member companies at international trade shows and exhibitions under the Forth banner. However, the most effective strategy in this regard has been Forth's focused work to grow the regional EV Roadmap Conference²² into a national event that would draw leading thinkers to Oregon, focusing greater attention on our regional electric vehicle companies and leadership. That effort has been wildly successful. The latest Roadmap Conference, held in June 2017, attracted 663 industry leaders from across the world, and the event has become widely regarded as the best in this space.

3.2 Partnerships Lead to Policy Advances

Public-private partnerships are also critical to advancing public policies that strengthen electric and advanced mobility. Lawmakers prefer to see legislation come before them with broad coalitions already organized in support. Legislation is far less likely to succeed if it is supported by only one interest (e.g. environmental advocates or electric utilities) or by just one company or industry. By mobilizing a broad constituency of stakeholders, Forth has been able to make significant policy gains in the region.

3.2.1 Engaging Electric Utilities

For example, as mentioned previously, legislation adopted by Oregon in 2016 doubled the state's renewable energy requirements to 50% and banned the sale of coal fired electricity. This legislation was negotiated by electric utilities and environmental advocates. Forth was not involved in the fundamental negotiations, which were tied to a broader set of issues around carbon pricing and climate change. However, both sets of stakeholders are represented in Forth's membership, and both had an interest in seeing transportation electrification provisions included in this legislation as well. Forth was able to help these stakeholders develop legislative language that would advance transportation electrification broadly, rather than simply the interests of one company or one stakeholder. Since passage, Forth has been actively working to help the electric utilities develop transportation electrification plans. Forth plays a unique and valuable role because it represents the industry as a whole – car makers, charging companies, local governments, environmental advocates, and utilities – and because Forth has no agenda other than advancing the industry as a whole.

3.2.2 Securing a Rebate for Electric Vehicles

Forth's work to secure electric vehicle rebates in Oregon provides another example of the power of public-private partnerships. Forth first began work on this issue in 2014, and struggled unsuccessfully to make the case for spending state funds on electric vehicle rebates. While Forth represented a broad coalition of industry stakeholders, it lacked the political "muscle" to move this issue on its own. In other words, we did not have strong enough partnerships with key stakeholders to move this proposal forward.

In 2017, however, Forth was able to make the need for an electric vehicle rebate part of a broader conversation about modernizing Oregon's transportation system. Working with environmental groups that wanted to ensure a proposed transportation funding package would reduce air pollution and carbon, Forth was ultimately able to embed USD \$72 million in a larger USD \$5.3 billion transportation funding package that was passed in Oregon.²³

3.3 Partnerships Produce Cutting Edge Demonstration Projects

While Oregon and the Pacific Northwest are relatively small markets globally, Forth has worked with partners to make the region a "living laboratory" for electric mobility demonstration and pilot projects. With a mission-driven focus on strengthening advanced mobility, a broad network of stakeholders, and access to diverse funding sources, Forth can act as an entrepreneurial consulting firm, but without the need to have a predetermined client. Instead, Forth:

1. Works with its members and network to identify industry needs and problems;
2. Designs projects that can test sustainable and scalable solutions to these problems;
3. Assembles partners, funding, and other resources;
4. Serves as a project manager for high-impact demonstration projects; and
5. Shares evaluations and reports that move the industry forward.

3.3.1 Building Markets for E-Bikes

One early example of how Forth has used this approach to move the industry forward relates to electric assist bicycles. While low-cost electric assist bicycles have long been popular in parts of Asia, and increasingly sophisticated e-bikes are seizing growing market share in Europe, these vehicles remain relatively unknown in the United States. Leveraging Portland's strong bicycle infrastructure, Forth worked with Portland State University to conduct and evaluate a demonstration project that loaned electric assist bicycles to employees of a local health care firm.²⁴ In the process, Forth learned valuable lessons about effective marketing strategies for e-bikes, developing tools and testing social media promotion campaigns.²⁵

ELECTRIC BIKES

Power your commute



E-bikes offer all the advantages of a regular bicycle – without the sweat or spandex. That's why more Oregonians are making the switch to electric bicycles every day. To find out how to test-ride an e-bike and transform your commute, visit forthmobility.org/ebikes.

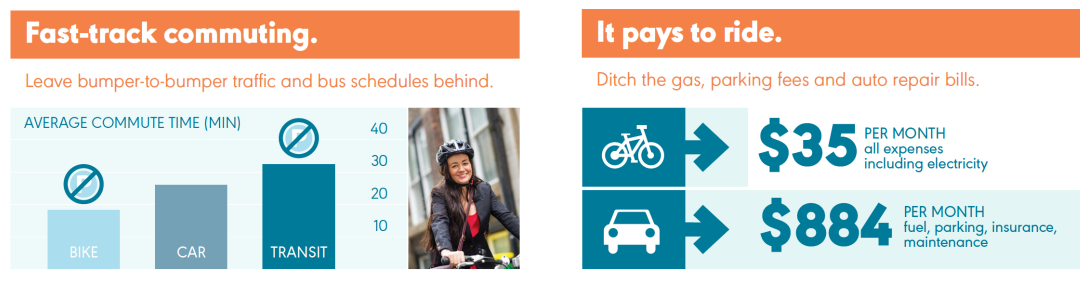


Figure 2. Sample e-bike marketing infographic used by Forth in social media campaigns

More recently, Forth has begun a pilot project testing e-bikes as a mobility solution for residents without licenses to drive – many of whom cannot legally drive, because they are living in Oregon without legal documentation. Forth has also incorporated e-bikes into its Go Forth Electric Showcase, described elsewhere in this paper. These efforts, collectively, are helping to develop the market for electric assist bicycles as a product class in the United States. These projects have been made possible by a combination of federal government grant funds, private philanthropic foundation support, donated or discounted e-bikes, and many public and private partners.

3.3.2 Bringing Electric Mobility to Underserved Communities

Forth has also focused increasing attention on how best to ensure that electric vehicles and other new mobility technologies benefit traditionally underserved communities, such as low income populations and communities of color. Transportation is the second highest household expense for most Americans, and poorer people spend an even larger percentage of their income on mobility than most households. Used electric vehicles are increasingly available and affordable, with many 2-3-year-old Nissan Leaf cars available for about USD \$7,500. However, low income communities are not aware of these vehicles, do not generally have electric vehicles marketed to them, and may be mistrustful of outside organizations. Forth is

partnering with the Hacienda Community Development Corporation, a community based affordable housing organization in Portland, to overcome these challenges.

Through this partnership, Forth has provided used Honda Fit electric cars and Blink chargers for use by Hacienda staff – saving them money over their prior practice of paying staff to use private vehicles. These vehicles are also available for rental by community residents via the Turo peer-to-peer car sharing application, creating new mobility options for residents. Furthermore, Forth is building on this foundation by developing used electric vehicle “ride and drive” events in the community, highlighting the availability of affordable used electric cars.



Figure 3. Used Electric Vehicle Car Sharing Project With Hacienda CDC

Here again, this project would not have been possible without diverse public-private partnerships among Hacienda, Honda, Blink/Car Charging Group, Pacific Power, private philanthropic foundations, and many other partners.

3.3.3 Electrifying Shared Mobility

Many stakeholders have been working to electrify shared mobility services, from taxis to transit buses to car sharing services. Transportation Network Companies such as Uber and Lyft pose challenges, since drivers are using their own private vehicles to provide those services. Here again, Forth is developing an innovative demonstration project made possible by its diverse network of members and collaborating organizations. Announced in April 2017, the Uber Electric project²⁶ is a partnership designed to help get more Uber drivers to choose clean electric vehicles.

The program includes several parts, including educating Uber drivers about their electric vehicle options and key operational issues; developing attractive financing packages for new and used electric vehicles for Uber drivers; making attractively priced DC Fast Charging widely available for Uber drivers; and training and incentivizing Uber drivers to be “EV Ambassadors,” encouraging their passengers to consider electric vehicles for themselves. Ultimately, passengers in electric Uber vehicles will receive in-app notifications encouraging them to schedule test drives at the Go Forth Electric Showcase, described in more detail

below. While the program is still in its early development stages, Forth is already seeing strong interest from other markets. Here again, this effort will rely on strong industry engagement and partnerships with local electric utilities, charging providers, auto dealers, financing organizations, and many other public and private organizations.

3.4 Partnerships Drive Market Transformation

Public-private partnerships are arguably most important when it comes to accelerating electric vehicle sales in the marketplace. Electric vehicles are not simply cars with a different power plant: they represent a very different product, and a very different business model. They are fuelled differently, used differently, and perform differently. When we add connected, shared, and autonomous technologies to the mix, it is clear that new mobility technologies represent a fundamental disruption of the marketplace. As a recent analysis by the International Council on Clean Transportation concludes, “Growth in the electric vehicle market requires many actions by many players.”²⁷

3.4.1 Partnering to Develop Fast Charging Infrastructure

Oregon, Washington, and California led the nation in creating the first fully electrified highway (Interstate 5, dubbed the “West Coast Electric Highway.”²⁸) This effort was a perfect example of collaborative partnerships. The three states identified a need, but did not have funding or authority to operate charging infrastructure. Instead, this shared vision allowed them to each find unique strategies and funding sources to build out sections of this corridor.

Forth and other private partners have served as advisors, cheerleaders, marketers, and lobbyists for this effort, and private partners have also been critical to building out and managing the corridor. Forth continues to work with partners to identify best practices in developing effective charging infrastructure, most recently presenting a paper on fast charging “lessons learned” at the EVS 29 conference in Montreal.²⁹

3.4.2 Partnerships Make Charging “The New Bike Rack”

The US Department of Energy launched the Workplace Charging Challenge to convince more employers to provide charging for their employees – and has found that employees at participating workplaces are up to 20 times more likely to drive electric vehicles.³⁰ While government agencies can offer recognition or financial incentives for workplace charging, and companies that make and sell charging equipment obviously have an incentive to promote their products to employers, Forth has found that it is far more effective to have a partnership among interests. Forth’s role has been to promote workplace charging as a concept, or a movement, much as supporting bicycle-commuting employees has been a social movement led by bicycle advocates over the past few decades. With this in mind, Forth has developed and promoted several user-friendly infographics to promote workplace charging, and has tested paid social media campaigns and other tactics to engage employers.

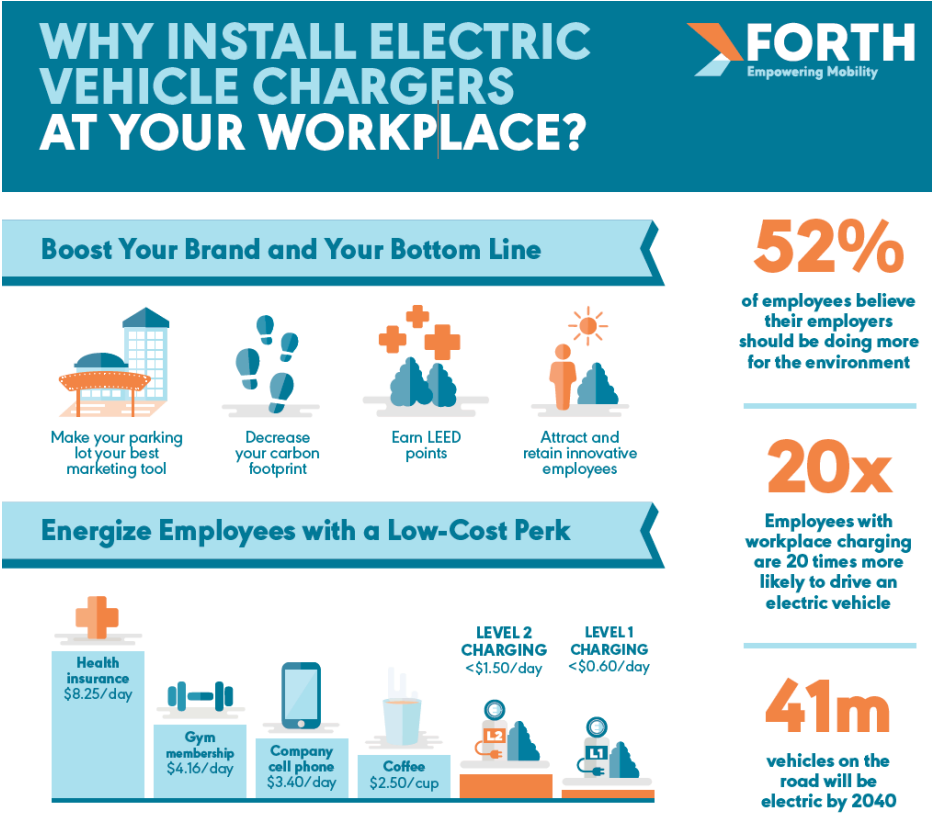


Figure 4. Sample Workplace Charging Infographic

The success of this approach is shown by the fact that Forth was the most successful organization in the country at recruiting employers to the program. In fact, Forth was ultimately responsible for 16% of all partners in the nation, including global firms such as Nike, Intel, and HP.

3.4.3 Partners Create a Brand Neutral Showroom

The culmination of these public private partnerships to drive electric vehicle adoption is the Go Forth Electric Showcase, opened in downtown Portland in May 2017. The Showcase includes a physical showroom in downtown Portland, open 6 days a week, with multiple electric vehicle models and charging equipment from multiple vendors. Staffed by brand-neutral Forth employees and volunteers, the Showroom provides a “safe space” for consumers to explore their options. Forth staff offer test drives of several vehicle models, as well as short-term rentals on the Turo peer to peer platform. The project also includes “pop up” ride and drive events across the Pacific Northwest, and a regional marketing campaign that includes both traditional and social media elements.



Figure 5. Go Forth Electric Showcase, Exterior View

This Showcase would not be possible without strong partnerships. The US Department of Energy provided a three-year grant of USD \$1 million to fund creation and operation of the project. Local electric utility Portland General Electric is providing subsidized space for the Showroom. Charging companies and others have donated equipment, auto dealers and other partners have provided subsidized promotional partnerships and marketing, and more partners join this effort every month.

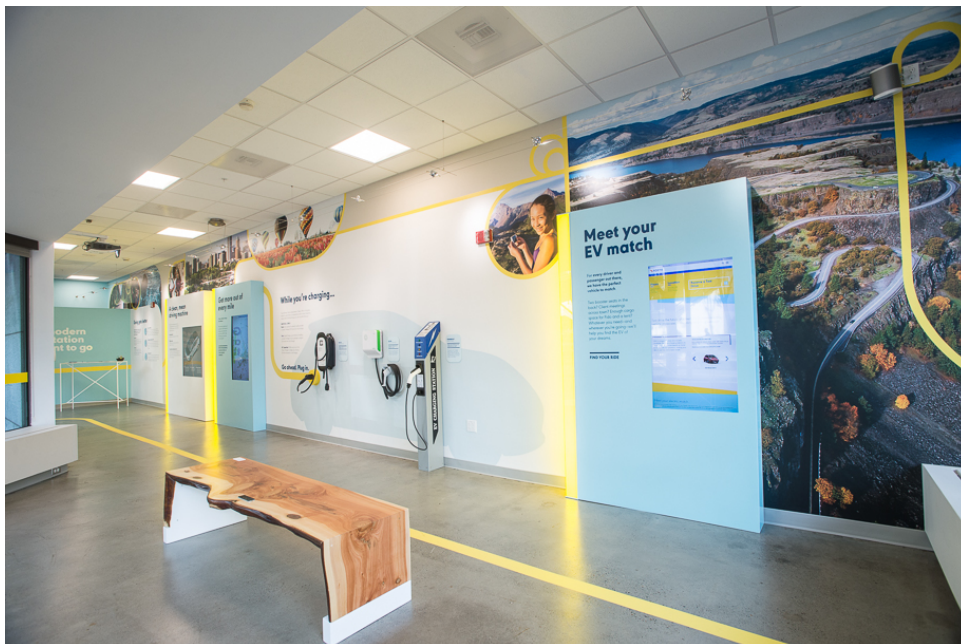


Figure 6. Go Forth Electric Showcase, Interior View

4 Lessons Learned and Recommendations

Forth has been working to advance electric and “smart” mobility since 2011, in a wide variety of ways. Our work continues to evolve alongside the industry. This work has yielded several lessons for other regions interested in promoting electric mobility.

4.1 Find “A Suit to Own It”

During work with early stage technology companies in the United States, I once heard an investor ask, “Who is the suit who owns this issue?” In other words, the investor wanted to know that a single senior executive was ultimately focused on the issue, and responsible for making sure it was resolved. This same approach is critical to advanced mobility in a region. There needs to be a single clear central advocate for electric and smart mobility who has responsibility for moving the agenda forward and remains focused on making forward progress. This organization needs to be willing to innovate, to be nimble, and to take risks, recognizing that there will be failures as well as successes. Or, to paraphrase Tacitus, “victory has many fathers, failure is an orphan.”³¹ We believe that non-governmental organizations or networks of organizations will generally be more effective at this work than any single business or government agency. If an appropriate organization does not yet exist, regional partners should come together to create one.

4.2 Pitch a Big Tent

Electric and smart mobility issues cannot simply be assigned to a transportation or planning agency - or to a car company or an electric utility. Advanced mobility impacts these stakeholders and many more: electric utilities, vehicle manufacturers, suppliers, charging companies, government agencies at all levels, non-governmental organizations and advocates, real estate developers, housing organizations, and others. One of the roles of the central advocate for smart mobility must be to actively seek out, engage, and partner with these stakeholders – many of whom may not yet realize that they have a role to play. Involving diverse stakeholders early and often, even when they are reluctant, will ultimately save time and produce better outcomes. Business members will sometimes be competing for business, but we all share an interest in growing the overall industry and market. There will be similar issues among competing government agencies and organizations. Keep the big picture in mind.

4.3 Build a Community

Transforming mobility requires that diverse stakeholders work together in new and different ways. This becomes much easier if those stakeholders are able to develop strong and trusting personal relationships. One important role for a central smart mobility advocate is to bring these stakeholders together to build these relationships and to begin to explore the emerging connections among them that are being created by new mobility technologies. Forth has fostered these relationships through a series of monthly industry networking events held at local brewpubs over the past several years. A major annual conference, the Roadmap Conference³², brings several hundred leaders to the region as well. This conference also includes a networking reception, tours, long breaks, and other opportunities for attendees to build stronger relationships. There is an old saying among winemakers that “it takes a lot of good beer to make great wine.” We have found that good beer is also extremely helpful to make advances in mobility.

4.4 Embrace a Range of Solutions

Forth began with a narrow focus on electric mobility, and an implicit presumption that this primarily meant cars. Within a few months, we quickly realized that we needed to embrace a full range of electric vehicles, from electric assist bicycles and scooters to electric buses, forklifts, and industrial equipment, as well as the full supply chain feeding into these vehicles. Within a few years, we realized that we also needed to incorporate autonomous, connected, and shared mobility solutions into our work. Mobility is going through a period of extreme disruption, with new technologies and business models emerging constantly. Against this backdrop, advocates need to remain nimble and focused on outcomes rather than becoming too tied to any specific technology.

4.5 Think Globally, Act Regionally

As Forth has grown to embrace a broader range of smart mobility approaches, we have also come to realize that focusing just on Portland, or Oregon, was too limiting. Mobility is regional, and the Pacific Northwest is a coherent regional market that provides a larger canvas for innovation. We changed our name (previously Drive Oregon) in May 2017 to better reflect this expanded scope and vision. For other regional advocates, it will also be important to define an appropriate scale of action – large enough to have an

impact and support a core set of programs, but small enough to allow for the building of local relationships on the ground. However, this scope of action is defined, it is also critically important that regions seek out opportunities to share and adapt best practices from one another. While each region is slightly different, we have much to learn from one another.

Acknowledgments

Forth was created with funding from Business Oregon, through the Oregon Innovation Council. None of our work would have been possible without this strong and early support. We would also like to thank the volunteer board of directors, our members, and all our funders and supporters for their commitment to advancing smart mobility.

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