

Consumer EV Education Lessons Learned

- A Pacific Northwest approach to E-Mobility -

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ABSTRACT: The Northwest Electric Showcase Project is an effort led by Forth seeking to double the amount of electric vehicles sold in Oregon and Washington by 2020. This work, funded by the US Department of Energy, will use a variety of strategies to expand consumer awareness for electric vehicle viability including; a permanent storefront in Downtown Portland adjacent to the city's Electric Avenue, numerous "pop up" ride and drive events throughout Oregon and Washington, and an adaptive digital marketing and media campaign engineered to increase awareness and participation for electric vehicles and test drive events.

KEY WORDS: sustainability, infrastructure, marketing, education, implementation

1. INTRODUCTION

The Pacific Northwest Electric Showcase¹ has emerged as a natural next step for Forth and its partners, building on its strong history of success in advancing electric vehicle deployment in the region. Forth, formerly known as Drive Oregon, is a nonprofit 501c6 trade organization with an affiliated 501c3, the Forth Mobility Fund.

As a leader in per-capita PEV sales, the Pacific Northwest is in a unique position to make the leap from early adopter to early majority toward the "tipping point" for PEVs. Since the region is already starting at a higher level of PHEV registrations as opposed to other US regionsⁱⁱ, we feel we can achieve greater penetration and provide a roadmap for other regions by using effective engagement tactics such as offering a safe place like the Go Forth Electric Vehicle Showcase for education, free of a sales pitch, and mobile pop up ride and drives in several regional locations.

The goal of the Pacific Northwest Electric Showcase project is to transform the market from early adoption to early mainstream for PEVs in the Pacific Northwest, putting Oregon and

Washington on a sustainable path to increase sales more than tenfold, to at least 15% of all new cars sold by 2025. The project's interim goal is to at least double electric vehicle adoption rates by 2019, which translates into annual sales of 9,000 PEVs per year in Washington and 5,500 per year in Oregon, which also translates into total PEV sales of 33,000 in the two states over the funding's three-year performance period.

Our market includes the cities of Portland, Oregon and Seattle, Washington. While the market similaritiesⁱⁱⁱ of the two states can benefit from regional tactics of marketing and messaging, automakers treat these two states differently due to zero emission regulations. Oregon is a Zero Emission Vehicle (ZEV) state, having opted to be a part of California's Zero Emission Vehicle Program, and receives new models of EVs before Washington does, wherein Washington is not a ZEV state.

While the variety and availability of electric vehicles continues to grow in many cities, it remains to be seen how we can move past the "early adopter" market and grow mainstream consumer appeal. Automakers and dealerships have their own strategies for developing the plug-in car segment, but must also market their

(more common and more profitable) gas and diesel offerings. This co-marketing has led many to question the enthusiasm to sell a segment that has the potential to undercut more popular legacy offerings. In May 2014 Fiat Chrysler CEO Sergio Marchionne even went so far as to ask the public not to buy the Fiat 500E, saying that the company loses \$14k with each sale^{iv}. The Pacific Northwest Electric Showcase set out to promote plug-in vehicles to the masses and educate and objectively stimulate electric vehicles sales and accelerate the buying process. The following narrative is a brief description of putting the Showcase together, and some of the lessons we have learned in the process.

2. Project Execution

2.1. Putting the Showcase Together

Upon award of the US Department of Energy (USDOE) funding, Forth began the search for a suitable place to house the physical Showcase. Portland General Electric (PGE) is a large utility in the Portland metro area and has been a supporter and member of Forth's Board of Directors since inception. PGE occupies most of the real estate in the Portland World Trade Center group of buildings, and had an open rental space available for use.



Fig. 1 Go Forth Electric Showcase

The location, 901 SW 1st Ave. is in the heart of downtown Portland, and with a high density of neighboring businesses, has very high visibility. Located on the ground level of a busy street corner, hundreds of pedestrians walk by the Showcase every day. Through Forth's relationship with PGE, we were also able to secure the location for a much-reduced rent. The proximity to PGE and their commitment to EVs has also resulted in PGE holding monthly tours of the Showcase as part of the onboarding process for their new employees. The City of Portland has also provided free (and highly visible) on-street parking for Showcase vehicles directly in front of the location as an in-kind contribution.

Once the location was decided, Forth put out a Request for Proposals to design and build the Showcase. Several prospective designers were given tours of the space including VizWorks who ultimately won the contract for the work. The request for proposals requested a range of costs to be presented with the top-end being \$90,000. Brink Communications has a strong relationship with Forth and we felt confident that they could communicate our message. In addition, VizWorks would tackle the technical design and buildout of the space. Together with Brink, the Forth program managers worked to design the Showcase in a way that would inform visitors completely new to EVs yet provide further information to visitors who may already own an EV. Exhibits, descriptions and interactive displays were designed to have a museum quality appearance with user-friendly hands-on operation. Definitions of the types of EVs are lettered in large script on the wall near the entrance, and a light-up display of an EV shows the inner workings of the battery and regenerative brakes.



Fig. 2 EVSE on display

One of the most common questions from Showcase visitors is 'How do I charge an EV?' Charging methods, locations and options are unfortunately still a big confusing mystery for potential EV owners. Improved ranges of 200 miles or more do a lot to assuage range anxiety fears, but the fact remains that charging a car is still a new and unfamiliar experience for most people, and it takes longer than filling up a gas car, so generally consumers are wary. To tackle this problem at the Showcase, Forth installed several different charging units for visitors to handle. They can see the dryer plug and handles that are easy to manipulate, and we make the distinction to them of a 'smart' network-enabled unit vs. a non-networked 'dummy' unit. In seeking EVSE unit displays for

the Showcase, we leveraged our existing relationships with manufacturers and were successful in receiving more than enough units. The charging display is intended to be rotating to give fair play to manufacturers and new models. Most visitors are also surprised, yet reassured, to learn that nearly 80% of charging happens at home.^v

In addition, when tabling or hosting a ride and drive event, a demo level-2 electric vehicle charger provides a “hands on” prop that allows staff to give the consumer audience a chance to handle an EVSE.



Fig. 3 Showcase visitors explore charging options

A touchscreen display allows visitors to explore the many charging stations that are already available and illustrates the ease of finding a station while out and about. This tool has been extremely popular with visitors and provides an easy reference for volunteers and staff, both in the physical showroom and on tablets at ride & drive events. The display offers access to both the consumer-friendly “PlugShare” website, and the Alternative Fuels Data Center (AFDC) website. Both tools are available as web-based options and mobile app downloads for drivers.

The second touch screen in the Showcase has a unique tool, developed by Forth, called the EV DriveFinder^{vi}. The user answers a series of questions about their transportation requirements and the EV DriveFinder generates a list of vehicles that matches their needs. It also lets the user know which models they can test drive at the Showcase.

The Go Forth Electric Vehicle Showcase is usually staffed by one or two Forth staff members or interns and sometimes by an EV Ambassador. EV Ambassadors are volunteers who typically own an EV and are EV enthusiasts who enjoy speaking to the

public about their experience driving electric. All Forth staff and EV Ambassadors are shown an EV 101 presentation and periodically updated with news and information with current information about rebates, vehicles options, and charging.

2.2. Marketing & Advertising

Working with our primary marketing and communications partner Brink Communications, Forth developed a marketing strategy leveraging project contributions with an aim of attracting people to the Showcase and making them aware of the viability for electric vehicles. Several digital ads were tried over one-week periods with similar audience characteristics and the performance of these advertisements was used to inform effectiveness of future campaigns. Facebook, Instagram, Google, and the Chinook Book were all primary platforms for these tactics. A short radio clip was also recorded to drive summer traffic to test drive Forth’s electric vehicles and learn at the downtown Portland Showcase location. When digital assets were available, social media campaigns proved to be a cost-effective way of attracting impressions and trackable click-throughs.

Several prize package promotions were utilized and designed around an attractive, donated giveaway item. A weekend stay at a bed & breakfast in the Columbia River Gorge, Portland Auto Show tickets, and REI giveaways are examples of items that could be won by those engaging with the prize campaign.

Forth and our marketing team were able to draw upon a library of resources from previous educational electric vehicle efforts and either re-utilize existing assets or refresh a flyer or digital pieces using new language or color schemes. This led to greater economies for new campaigns allowing an emphasis on promotion rather than creation.

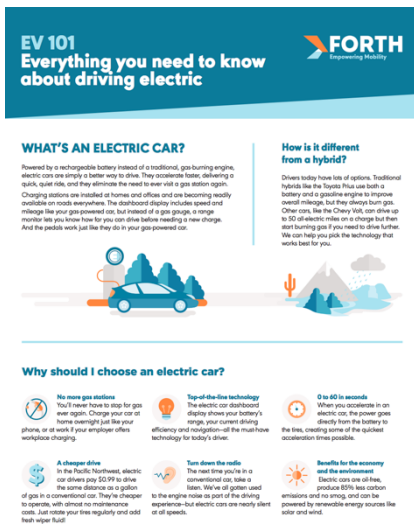


Fig. 4 EV 101 Digital Flyer Collateral Example

2.2.1. Launch

On May 2, 2017 with strong media coverage, the Go Forth Electric Vehicle Showcase officially opened. Many of the first test drivers heard about the Showcase through a TV news spot or coverage based on an interview about our new electric vehicle showroom. This TV spot was facilitated through Forth’s network of contacts and was free of charge. Although we may think of the nightly local news as ‘old school,’ considering that many people get their news from the internet, TV spots can generate considerable foot traffic. This same TV station contacted Forth again in September when the new \$2,500 EV point of sale rebate was passed in Oregon.

Print, social and radio media were also extensively used to promote the opening of the showcase. We have also been supported by regional discount book provider Celilo Group, purveyor of the Chinook Book, a sustainability-based coupon book for the Portland/Vancouver area. Chinook Book has a reach of more than 80,000 subscribers in Washington and more than 60,000 in Oregon and has been helpful in messaging to a wide audience to visit a ride and drive or the Go Forth Electric Vehicle Showcase and try an electric car. Chinook Books retail for \$25, but they are complimentary at the Showcase with a test drive.



Fig. 5 EV Roadmap 10, Portland Oregon World Trade Center

A little over a month after opening the Showcase, Forth hosted the 10th EV Roadmap conference directly across the street from the Showcase. As part of EV Roadmap 10, Forth hosted a live focus group drawn from Showcase test drive participants^{vii}. They were asked if they felt it was necessary to have a physical space to get information about EVs. Participants overwhelmingly answered yes, mostly due to the difficulty in sifting out information on the internet. As one panelist related, “If you do an online search for “Electric Vehicles” you get all kinds of hits, like hybrids.” The focus group agreed that it was important to speak to someone who was knowledgeable about EVs and be in an objective environment free from a sales pitch.

Members of the focus group also related that they felt they learned information from Forth that they would not have learned at dealership. One participant said before he came to test drive the 2014 Nissan Leaf at the Go Forth Electric Vehicle Showcase, he had test driven a used one at a local dealership. During the Forth test drive, the Forth employee pointed out the overall battery health indicator display on the dash and talked about how to interpret it. The participant said he realized that the used Leaf he had driven the day before at the dealership had very little battery life left, but the car dealer did not explain that, and it was not until the Forth employee pointed out how to read it that he understood. He was very glad he had not impulsively bought the used Leaf.

2.3. Grand Opening

On July 22nd, 2017, Forth celebrated the Grand Opening of the Showcase with a block party-style ride and drive. Tesla and Wentworth Chevrolet provided static vehicle displays, and ReachNow and a Ron Tonkin dealership provided test drive cars.

2.4. Operations and Outreach

Building on the momentum of EV Roadmap, the Northwest Electric Showcase had a very busy summer with strong visitor and test drive numbers, as well as visible presence at many outreach events. In conjunction with Forth's AmeriCorps member, Forth had a table nearly every weekend at events in June, July and August. The table below illustrates the monthly number of visitors and test drives.

Table 1 Number of Showcase Visitors.

Days Open	Month	# Visitors	Daily Average	# Test Drives	Daily Test Drive Avg
24	May	210	8.75	13	.54
27	June	398	14.74	29	1.07
26	July	287	11.03	49	1.88
29	Aug	275	9.48	22	.76
26	Sep	260	10	68	2.62
25	Oct	169	6.76	147	5.88
18	Nov	107	5.94	74	4.11
20	Dec	152	7.60	16	1.25
		1858		418	

2.5. Test Drives

One of the key features of the Northwest Electric Showcase is the ability to offer test drives of EVs in our fleet. Potential test drivers are first directed to the Forth website where they can make a reservation or if capacity allows they may be able to test drive at the time that they walk into the Showroom. Northwest Electric Showcase currently has four test drive vehicles to choose from: 2014 Nissan Leaf, 2017 Chevrolet Bolt EV, 2016 Chevrolet Volt and the 2016 Ford CMax Energi.

To encourage consumers who need extra time in a car, Forth listed its fleet vehicles on the crowd-sourced car rental platform Turo. This peer-to-peer car share program allows vehicles to be rented for up to two days at a time and allows a consumer to make a road trip, and otherwise experience living with an EV. Many Showcase visitors have expressed interest in this program and the potential to test a car on their own for an extended period. This option for experiencing a plug-in can also extend a reason to not own a second vehicle as you can borrow or rent from a neighbor when that option is needed. The Turo platform requires no hardware to be installed, allows the vehicle rental rate to be set by

the car owner, and provides insurance for the vehicle in exchange for a portion of the rental revenue. High quality images were also provided courtesy of a Turo hired photographer.

To date, Forth has had four rentals on Turo, the proceeds of which have slightly offset the costs of the vehicles. One difficulty we quickly realized was that the Chevrolet Bolt EV is too popular for Showcase test drives to be rented for very long on Turo. We had no problem attracting people to the Turo listing, however we often already had test drives scheduled for the days Turo users requested. Another problem was that potential Turo drivers wanted to pick up and drop off the vehicles at times when the Showcase was not open and no Forth employee was able to meet them.

While we have not yet found the best formula for Turo rentals, the rentals we have had have given very positive feedback and we are hopeful to better use this tool in the future.

2.6. Department of Energy Survey

In return for the generous support from the DOE, Forth has diligently asked all test drivers to complete a pre-and post-drive survey on their experience. This process has been both informative and problematic. When the Showcase first opened, administering the survey took a large amount of time, due to the length of the survey, so thankfully this was shortened. Since shortening the survey, the administration of it is more manageable. Test drivers understand that it is appropriate to take the time to fill out the survey, since the test drive is free. They are slightly confused when asked for their email address, since they assume Forth already has it from the reservation. The post-drive survey is less well received by the drivers; they often ask if it is the same survey because the questions are so similar to the pre-drive survey. It would make more sense in the future to only have a post-drive survey. After the test drive, participants are usually more relaxed and are much more willing to talk about their opinions and experiences, rather than prior.

2.7. Learning from Peers: the Toronto EV Centre

As test drive numbers originating from the Showcase dropped off with the start of winter, we sought out ideas to draw in more visitors and increase the visibility of the Showcase. After doing some online research, we reached out to Ron Groves, Director of Education and Outreach for Plug n' Drive. Plug n' Drive opened the EV Discovery Centre in May 2017 in Toronto, and we wanted

to compare notes and see if we could get any ideas for driving Showcase traffic.

We soon learned that the EV Centre has many distinct advantages over the Northwest Electric Showcase. The EV Centre averages approximately 10-15 test drives per day, all of them walk-ins since the Centre does not accept reservations. (At first glance, not accepting reservations could seem like a deterrent, but Forth has had a significant problem with test drive reservation cancellations.) We asked them how they achieve this, and Ron had several interesting answers. The EV Centre is housed in a much larger space, almost 1,900 sq. ft. as opposed to the 850 sq. ft. of the Go Forth Electric Vehicle Showcase. This allows them to rent out parts of the building as event space. Their main conference room is rebranded as the 'Powerplace,' with a slick one-page hand out and easy reservation system. While the Go Forth Electric Vehicle Showcase has had some events, it does not have a separate room for meetings. We have the use of a conference room within the surrounding World Trade Center (WTC), but visitors don't necessarily go through the Showcase on the way there – losing potential test drive interest. Forth also can use a larger event space across the street, but we are required to pay for a certain amount of catering from the WTC.

The EV Centre also has the distinct advantage of a large parking lot. The Go Forth Electric Vehicle Showcase is in a very visible, high foot-traffic spot, but there is very little convenient parking. All parking surrounding the Showcase is metered with a 2-hour time limit (and slightly aggressive parking enforcement workers,) and not much availability. The Northwest Electric Showcase has also, unfortunately, been beset by constant local construction, road upgrades and closures and bridge closures.

Of note, several Showcase visitors have noted that while they wish to test drive, they do not want to do so downtown where there is significant traffic, light and heavy rail, many cyclists and the above-mentioned construction.

One of the most significant differences between the EV Centre and the Northwest Electric Showcase is the way in which test drive vehicles were acquired. Many Northwest Electric Showcase test drivers have stated that they assumed that Forth received the vehicles at a free or reduced price and that local dealerships would have a strong vested interest in providing Northwest Electric Showcase with cars. This has not been the initial case; all

the Northwest Electric Showcase vehicles are leased or purchased by Forth. Forth has worked and continues to work on increasing local dealership participation in Showcase events and ride and drives. The EV Centre, however, had their vehicles donated. In addition, they have vehicles that are only for use at the EV Centre, and then a separate fleet that is used for their ride and drive events. Because many of the Canadian car manufacturers are in Toronto, the EV Centre has the advantage of having a direct relationship with the manufacturers to ask for donations, thereby going around the local car dealerships. Employee turnover at local dealerships is very high, and relationships between a dealer vs. a manufacturer are very different. As of this report Forth also will be adding a battery electric Honda Clarity to our test drive thanks to a loan by American Honda.

2.8. Utilities

One key strength that Forth continues to develop in relation to the Northwest Electric Showcase is our relationship with regional utilities. With more than 100 electric utilities in the Pacific Northwest there is a wide variety of enthusiasm and consideration for plug-in vehicles. These energy providers have a direct line of communication to their ratepayers and it is in their vested interest to support a transition to electric vehicles and investment in electric vehicle charging. Utility companies are great partners to have for a physical showcase and mobile pop-up ride and drive events. As noted previously, Forth has had a long relationship with regional energy provider PGE. They have offered EV purchase rebates to their employees and continue to support initiatives such as the PGE Employee EV Owners Club and workplace charging.

Forth has been an active partner helping both PGE and Pacific Power develop their EV proposals to the Oregon Public Utility Commission, which is expected to approve those plans in early 2018. This could lead to several million dollars of utility investment, including investments in brand-neutral consumer engagement. If the utilities decide to engage third-party contractors to assist in this work, Forth and the Showcase will be well positioned to compete for such work. Similar programs are being developed by utilities in Washington state, and by smaller non-regulated utilities across the region.

A piece of this project includes convening regular webinar calls with representatives from these utilities to discuss ongoing topics of electric mobility and the sharing of messaging and best practice

policies in the form of sample EV plans. Several of these utilities have been very receptive and eager to implement tools and host ride and drives. Utilities can help with marketing and promotion through their customer base and other industry partners. Others have been less engaged, but in most cases, have agreed to support an electric vehicle ride and drive in their service district for 2018.

2.9. Ride and Drives

As part of the Northwest Electric Showcase project we were tasked with hosting three ride and drive events in Oregon and three events in Washington in 2017. The Forth team has become efficient at delivering an educational and engaging experience. Our ride and drives typically rely on one or more community partners, often a utility, and whenever possible we try to engage nearby dealerships. The most successful events encompass multiple partners, a variety of dealerships, and the local city as well. The City of Seattle National Drive Electric Event is a good example of this where Forth collaborated with Western Washington Clean Cities, The City of Seattle, and the Seattle Electric Vehicle Owners Group to pull off an event that attracted more than 1000 consumers.

In addition, we also partnered with local organizations to host ride and drives for their employees and customers. We relied heavily on our utility partners to co-host existing local events that would attract foot traffic and maximize marketing dollars. The locations of the venues varied from public parks and farmer's markets to the Point Defiance Zoo.

Our team provided planning and onsite support staff and our fleet vehicles for test drives. There were some challenges in getting participation from local car dealerships to provide test drive vehicles and navigating service territories, so having our own vehicles available was extremely important. The attendees were requesting information regarding available models, charging options and available state and federal incentives. Most attendees were in the process or committed to buying an EV as their next car. Overall, our partners saw great value in hosting ride and drive events and were eager to participate in planning future events.

The experience of the ride and drives also serves to show the very strong commitment from individual Forth employees. For an October event in Ashland, Oregon, a trip that would normally take a little over five hours turned into nearly 10 hours for a program manager. We felt it was important to bring a battery all-electric

Chevrolet Bolt to the Southern Oregon city, but a lack of charging infrastructure meant that the trip time more than doubled. Also in October, two Forth employees braved another five-hour drive and chilly temps to take part in a ride and drive in the Northern Washington border town of Bellingham. Even a local workplace ride and drive in Portland turned into an endurance adventure when one dealer unexpectedly pulled out of participation. Scheduled test drivers had to be condensed into a very tight schedule. That day a Forth employee managed 12 back-to-back test drives of the Bolt, fully using every 15-minute scheduled slot between 10-1pm.

2.9. The Showcase in a Smart City

Forth staff helped draft Portland's proposal to the federal Smart City Challenge, and we have remained engaged in regional efforts. From its inception, the Showcase project was designed to dovetail with the Portland region's Smart City efforts. For example, public agency staff routinely include the physical Showcase on tours for visiting smart city dignitaries, and we have recently been working with Travel Portland to promote the facility as a more general tourist attraction as well. Showcase efforts to bring electric mobility to traditionally underserved communities have been of particular interest to regional smart city planners, and we expect continued and deepening collaborations around these issues.

3. CONCLUSION

As the Forth team enters year two of the Pacific Northwest Electric Showcase project many considerations are on the table for discussion as plans are defined for future efforts. Without question, the new Oregon electric vehicle rebate will change the nature of outreach and plug-in education at the Northwest Electric Showcase by providing a quantifiable reason to buy an EV. Other plans include further outreach and relationship building with local and regional dealerships. Dealerships have the strongest role in new vehicles sales and as more programming comes online at the Showcase space, dealer training, networking events, and others engagement techniques will be trialed.

Strategies that are planned be implemented to improve consumer engagement at the Go Forth Electric Showcase for 2018 include:

	Next steps to address
That we need more events to drive traffic to the Showcase.	-Plan to host at least one external networking or engagement each month. -Plan to host at least two tours provided to an external partner organization each month.
That we need better auto dealer engagement.	-Plan to host and promote a monthly “dealer expert” paired with their electric vehicle each month. =Weekly outreach to area dealers including a one-pager flyer dedicated to explaining how the Go Forth Showcase can help them reach EV sales goals.
That the Showcase creates educational opportunities that are useful for a wide range of audiences.	-Developing electric vehicle curriculum and working through local school districts and charter schools to coordinate classroom Showcase visits.

ⁱ The Pacific Northwest Electric Showcase comprises the physical Go Forth Electric Vehicle Showcase also referred to as the ‘Showcase,’ the mobile pop-up ride and drive events that Forth organizes, and a regional marketing effort.

ⁱⁱ <https://energy.gov/eere/vehicles/articles/fotw-1004-november-20-2017-california-had-highest-concentration-plug-vehicles>

In the current budget period, October 2016 thru October 2017, \$816,033 was expended, much of which was provided as in-kind match. The \$435,330 that was provided was more than was anticipated for the first year of the project and included marketing and media support and the Portland International Auto Show, make ready improvements for the Showcase physical space, and staff time provided by the Forth team. Very few cash sponsorships arrived in time to tabulate for the first budget period and this presents a challenge for future budgets. As plans for budget period 2 continue to be refined an added emphasis will be placed attracting cash sponsorships while decreasing overhead costs.

This adaptive management approach to the showcase project will ultimately lead to refined and smooth-running engagement systems that can serve to move electric vehicle consumer adoption past the early adopter market and forward to the mainstreaming e-mobility.

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