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Tools for Accelerating EV Adoption in Columbus, OH

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Executive Summary

In 2016, the City of Columbus won the U.S. Department of Transportation's Smart City Challenge, after competing with 77 other cities. These dollars provided the seed funding for Smart Columbus—a region-wide Smart City initiative co-led by the City of Columbus and the Columbus Partnership. Smart Columbus was awarded two grants: $40 million from the U.S. Department of Transportation to test the latest mobility technologies that improve quality of life for our residents, and $10 million from the Paul G. Allen Family Foundation to reduce greenhouse gas emissions through the electrification of the transportation sector.

By increasing the electric vehicle (EV) adoption rate from 0.37[1] percent to 1.8 percent of passenger vehicles, Columbus will be among the highest share of EV registrations for any city with no zero-emission vehicle (ZEV) regulation or direct incentives to customers. The increase represents a near 500 percent increase in the market share for EVs in a metropolitan area that has only grown 12 percent from 2017 to 2019.

To establish an EV market with no additional government financial incentives, Smart Columbus has focused on early adopters and deployed targeted education and adoption interventions. Through the Paul G. Allen Family Foundation grant, Smart Columbus invites large employers from the region's private sector to join the Acceleration Partners program, which targets Fortune 1000 companies headquartered in Columbus.

The Acceleration Partners program is tailored to each corporate environment and provides a significant entry point into drive electric and drive less initiatives for the early adopter population in the Columbus region. The program goal is to have 100 active companies and 100 empowered senior leaders by the end of the grant period in 2020. Smart Columbus has met nearly half of its program goals and believes the five program commitments that each company agrees to will make significant impact in the Columbus region.

Key Words: consumers, education, EV, incentive, marketing, sales, ZEV

1 EV Market & Policy Environment

1a. Global & U.S. EV market

In 2017, global EV sales passed one million units, and according to the McKinsey Electric Vehicle Index growth trajectory, EV sales are expected to reach 4.5 million globally by 2020.[2]

The U.S. EV market grew 27 percent from 2016 to 2017, compared to China's EV market which grew 72 percent and Europe's EV market that grew by 40 percent over the same time.[2]

China also has some of the most generous EV incentives and subsidies for consumers, offering 50,000 renmibi ($7,900 U.S. dollars) for long-range BEVs and 22,000 renminbi ($3,500 U.S. dollars) for plug-in hybrid vehicles.[2]

> *Electric vehicles are exempt from license-plate lotteries and auctions in some Chinese cities, and this still plays an instrumental role in promoting EVs. After a successful pilot program in selected cities, the Chinese government decided last year to introduce green license plates for new energy vehicles (NEVs) across the country. At the end of 2017, the plates were rolled out to all provincial capitals and other selected major cities, with the remaining cities to follow in the first half of 2018. Car owners with these license plates will be eligible for preferential treatment. Furthermore, China's national and local subsidies for electric vehicles are among the world's highest, reducing consumer concerns about the comparatively high up-front cost.*[2]

The U.S. currently offers a federal tax credit from $2,500 to $7,500 toward the purchase or lease of a new EV, which varies based on the make and model of the EV purchased.[3] The full tax credit is available to the first 200,000 EVs sold per model, and both Tesla and GM are quickly entering a phase-out period where the tax credit begins to lower.

Currently, there are several states in the U.S. that offer per-car zero emission vehicle incentives, on top of the federal incentive including:

- New York at $2,000
- Massachusetts at $2,500
- Connecticut at $3,000
- Maryland at $3,000
- Delaware at $3,500
- Colorado at $5,000
- California up to $7,500[4]

The state of Ohio does not offer any additional incentives for zero-emission vehicles.

1b. U.S. policy environment

In April 2018, the U.S. Environmental Protection Agency announced a proposal to lower vehicle emission standards, as a next phase of regulations are slated to hit car companies in 2021.[5] Though legislative changes have yet to be announced, U.S. President Donald Trump has announced interest in eliminating the EV federal tax credit and in February 2019, legislation to discontinue the federal tax credit and add an annual tax on EVs was introduced by lawmakers.[6]

> *As it is the credits are not permanent, and are scheduled to phase out during the calendar year after an automaker sells 200,000 EVs and/or PHEVs. Tesla has already reached that milestone, which the tax credit on Tesla models drops to $3,750 for vehicles sold between January 1 and June 30, 2019. It will then be reduced to $1,875 for units sold beginning July 1, 2019, and will be eliminated altogether on December 31, 2019.*
>
> *Ironically, General Motors confirmed it would reach sales of 200,000 plug-in cars this year. For all of the president's acrimony that means GM's credits are already set to phase out (starting in April 2020).*[7]

1c. Columbus Region market

Because the state of Ohio is not a ZEV state, there is no prior EV sales history, and it was difficult to quantify availability of EVs in the market. We realized that in order to sell EVs in the seven-county

Columbus Region, dealers have to stock cars with lower or often negative profit margins from manufacturers that don't receive a state incentive.

EVs are known to cost less to maintain and therefore generate less ongoing service and repair work[8,9]. This current financial environment strains the manufacturer-dealer relationship and negatively impacts the customer journey.

The Smart Columbus goal to increase EV adoption rate from 0.37 percent[1] to 1.8 percent of passenger vehicles represents a near 500 percent increase in the market share for PEVs in a metropolitan area that has only grown 12 percent over the past three years.

2 Understanding Early Adopters

In March 2018, Smart Columbus and research firm Navigant, published the findings of a survey of 900 people in the Columbus Region who were identified as early adopters or early majority users for EVs, and who were looking to buy a new car in the next four years. The survey measures respondents' vehicle preferences, EV awareness, considerations when buying a car, barriers to purchase and other consumer characteristics. The goal of the survey was to baseline consumer understanding of and receptivity to EVs in the region, with the intent to repeat the survey at the conclusion of the Smart Columbus Electrification Program in 2020. The survey also helped Smart Columbus better understand opportunities and barriers to EV adoption in the region, and how measures of EV adoption compare to nationwide EV figures.

The survey found that the ideal candidate for purchasing an EV in Columbus is more likely to be between the ages of 30 and 44, make $100,000 or more annually and hold a bachelor's and/or graduate degree. These results are similar to national survey results of people interested in buying EVs.[10] This reinforces the early adopter profile, as Midwest early adopters are no different than those in high adoption cities across the county.

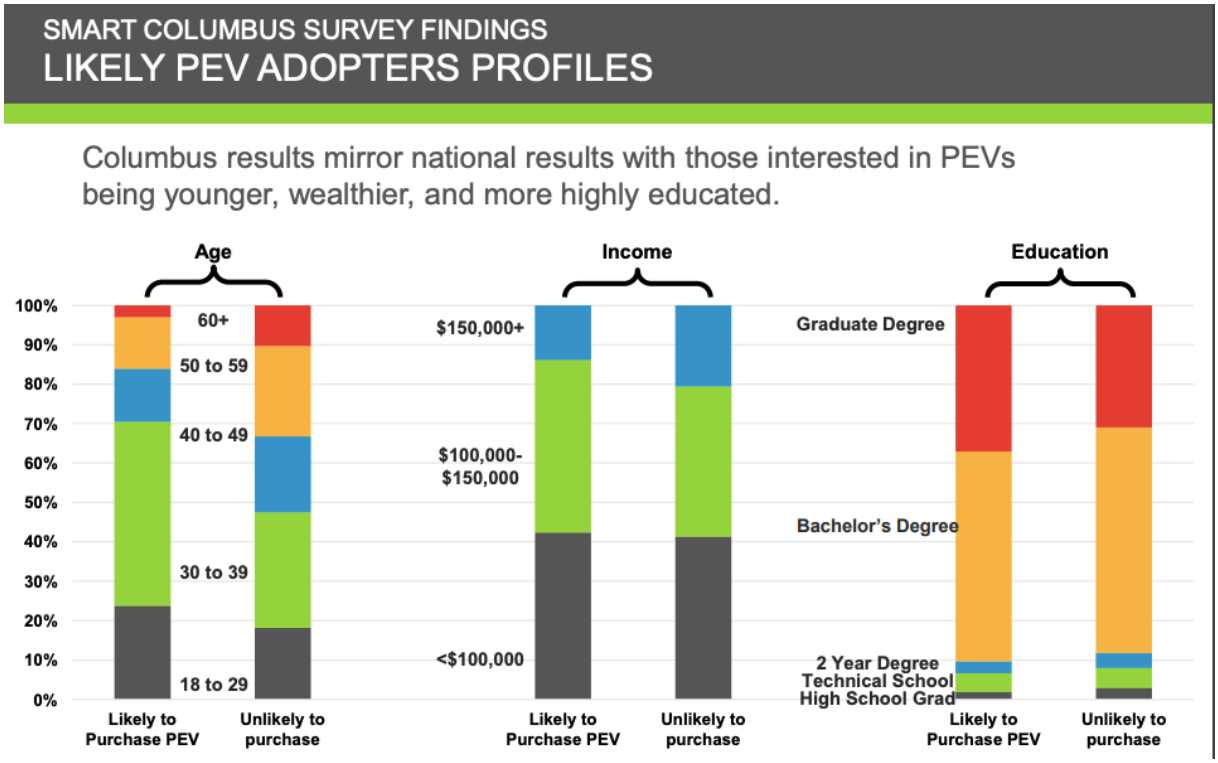

Figure 1: EV Adopter Profiles [10]

Misunderstandings about EVs were prevalent, even among early adopters, the survey found. For example, 60 percent of respondents underestimated the fuel savings of an EV. Sixty percent also overestimated

vehicle range.

Two-thirds of survey respondents think that maintenance costs are the same or higher with EVs compared to fuel-powered vehicles. Overall, the survey found that respondents had limited brand knowledge of the names of EVs and companies that produce them.[10]

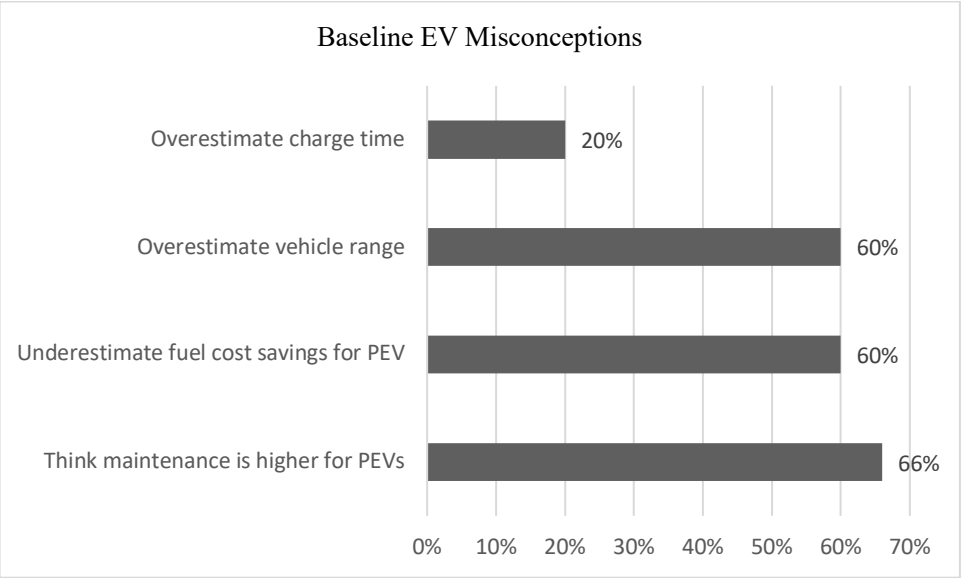

Figure 2: Baseline EV Misconceptions in Columbus Region [10]

According to the Navigant survey[10], more than a third of people surveyed were aware of the $7,500 federal tax credit for EV purchase. Forty-two percent of people surveyed were aware of one of more public charging station locations. Two-thirds of respondents knew that charging times average between three to six, or five to nine hours.

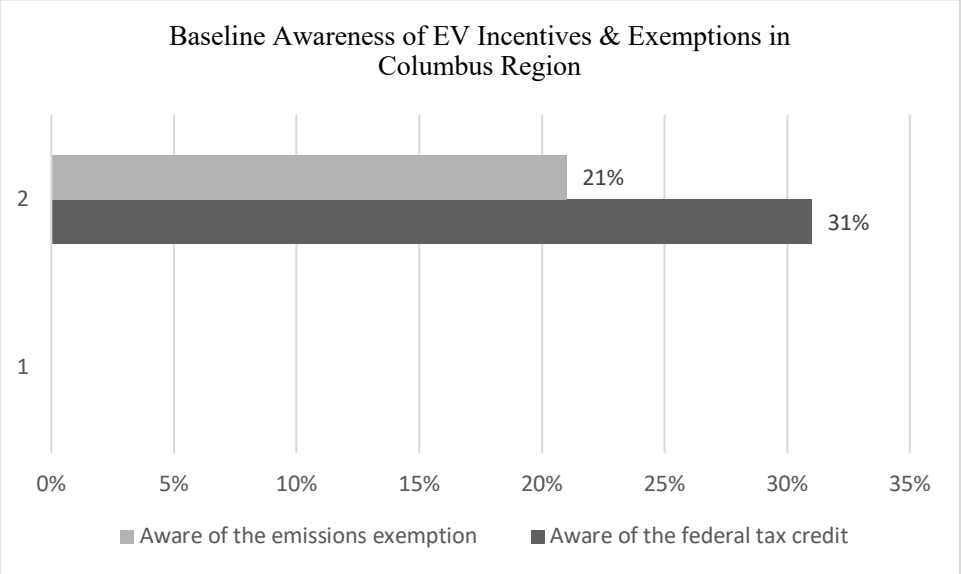

Figure 3: Baseline Awareness of EV Incentives & Exemptions in Columbus Region [10]

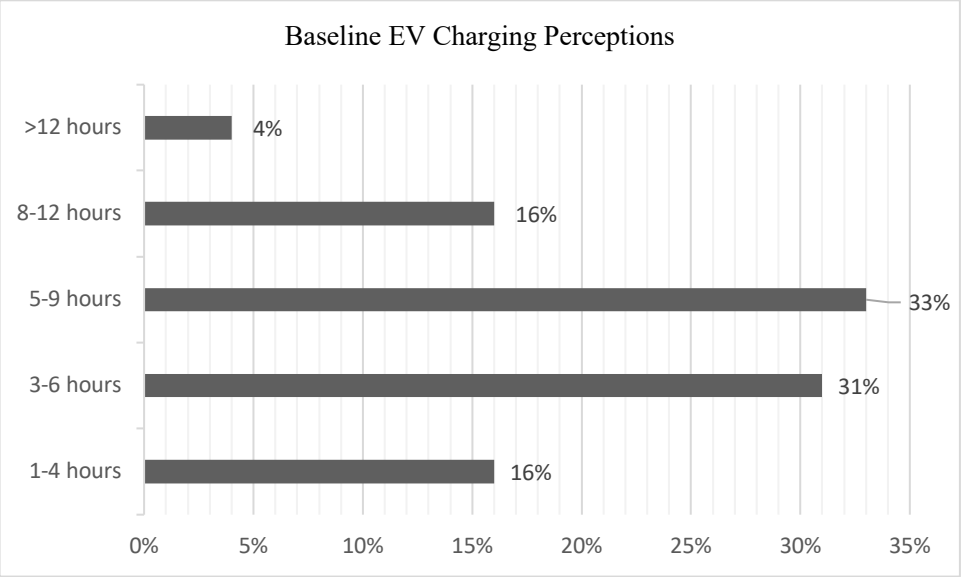

Figure 4: Baseline EV Charging Perceptions in Columbus Region [10]

3 Leading Early Adopters Through the Consumer Journey

Smart Columbus is implementing a suite of highly strategic interventions focused on guiding drivers through the customer journey, from awareness to consideration, and then purchase. We had a hypothesis that we could find and engage early adopters at their place of employment.

Figure 5: Smart Columbus Consumer Adoption Program Timeline

Smart Columbus created the Acceleration Partner program to provide a framework for activating large employers in the region to lead our community into the future with the Smart City movement. A substantial part of this program focuses on incentivizing and inspiring associates to drive less and drive electric.

Employers make five commitments in order to be a part of the Acceleration Partner program including:

- Designating a senior leader to lead internal, cross-functional teams that uplift program commitments. Senior leaders appoint mobility ambassadors who mobilize a cross-departmental internal team to focus on offering new mobility benefit packages.
- Introducing EVs into corporate fleet and encouraging senior leadership to model the way by driving electric.
- Installing EV charging infrastructure at two percent of corporate parking spaces and laying conduit in new parking structures to prepare for the future.
- Host a Smart Columbus Ride & Drive event as a way to offer EV test drives to employees in an educational, low-pressure environment.
- Incentivize employee behavior change by implementing mobility benefit packages based off of employee commuting habits and EV ownership.

3a. AWARENESS & EDUCATION

Smart Columbus Experience Center

The Smart Columbus Experience Center opened in July 2018, and offers brand-agnostic, hands-on opportunities for the public to learn about and test drive EVs. Located in downtown Columbus, the Experience Center is easily accessible to the public, open seven days a week, and features interactive electrification displays and six loaned EVs for display and test drives. Highly-trained ambassadors and staff provide EV education and test drives to visitors.

As of December 2018, the Experience Center has had more than 3,500 visitors. There have been 219 EV test drives, with a goal of conducting 400 by 2020. Of those drivers, 30 percent opted into being contacted by a dealer, surpassing the goal of 13.5 percent.

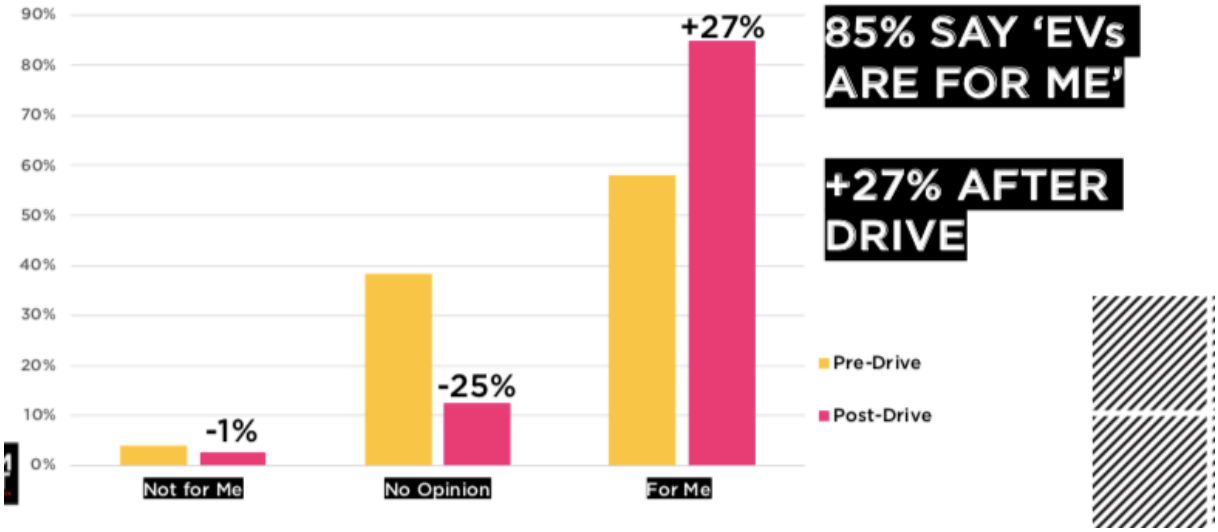

Figure 6: Smart Columbus Experience Center survey results

Post-drive surveys found that 27 percent more drivers stated that 'EVs are for me" after their Experience Center test drive. Overall, 85 percent of drivers stated that 'EVs are for me.' Post-drive surveys also found that more than 22 percent of drivers are more likely to make their next car purchase an EV.

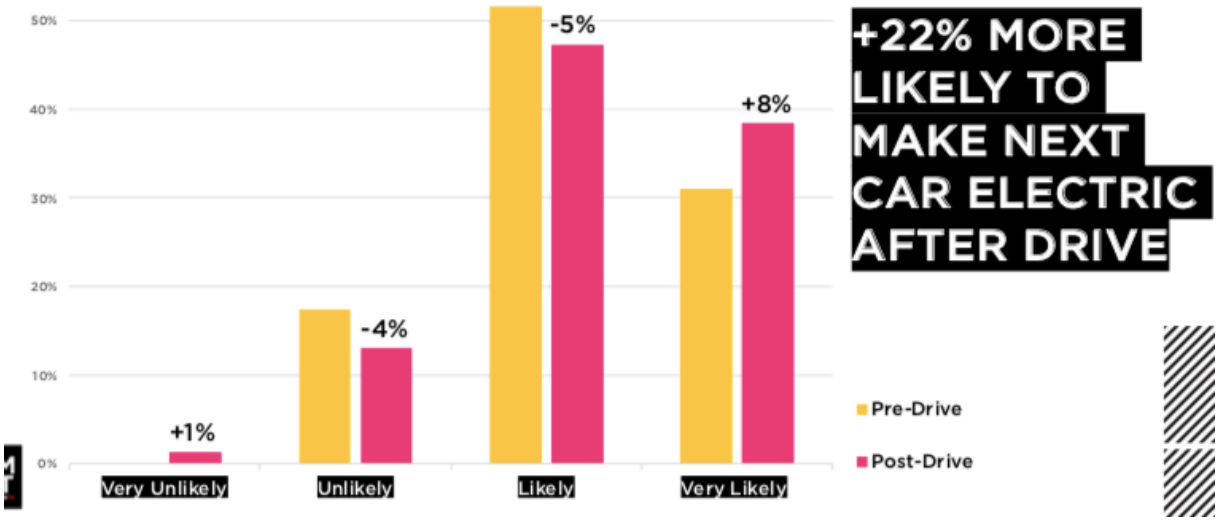

Figure 7: Smart Columbus Experience Center survey results

Ride & Drive Roadshow

The Ride & Drive Roadshow is Smart Columbus' flagship EV education program. The initiative drives EV adoption by educating central Ohio residents about EVs, and by providing opportunities for residents to test drive electric vehicles of all varieties in a low- pressure, educational environment. The Ride & Drive target audience is focused on large employers in the Columbus Region based on the hypothesis that a high concentration of early adopters work at these employers.

The goal of the Ride & Drive strategy that will put 12,000 people behind the wheel of an EV by

2020, with at least 13.5 percent of them opting in to be contacted by a dealer about the vehicle they drove.

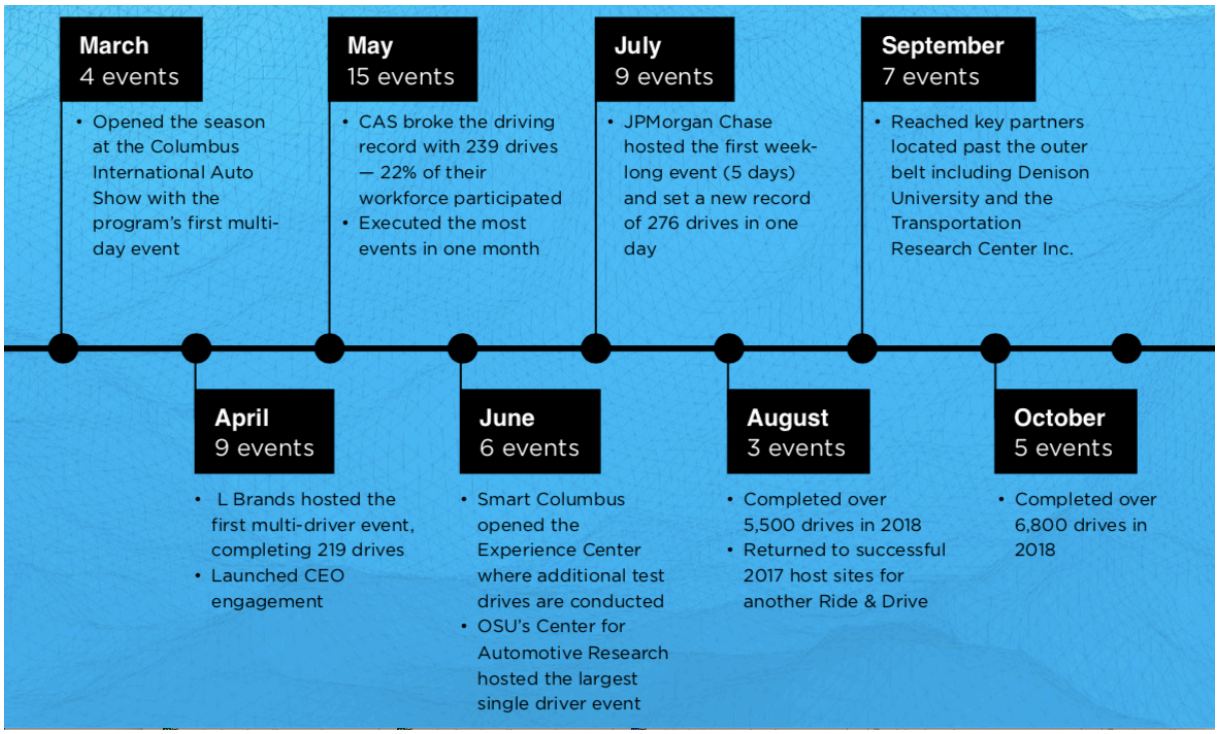

Figure 8: 2018 Smart Columbus Ride & Drive Roadshow Timeline

In 2018, Smart Columbus hosted 59 Ride & Drive events, and completed 6,837 drives. Of the events held with local employers, 2.5 percent of drivers were EV owners at the time of their drive, and 46 percent of early adopters reported that they plan to purchase a new vehicle in the next two years. This left plenty of opportunity to encourage attitude change and increase adoption.

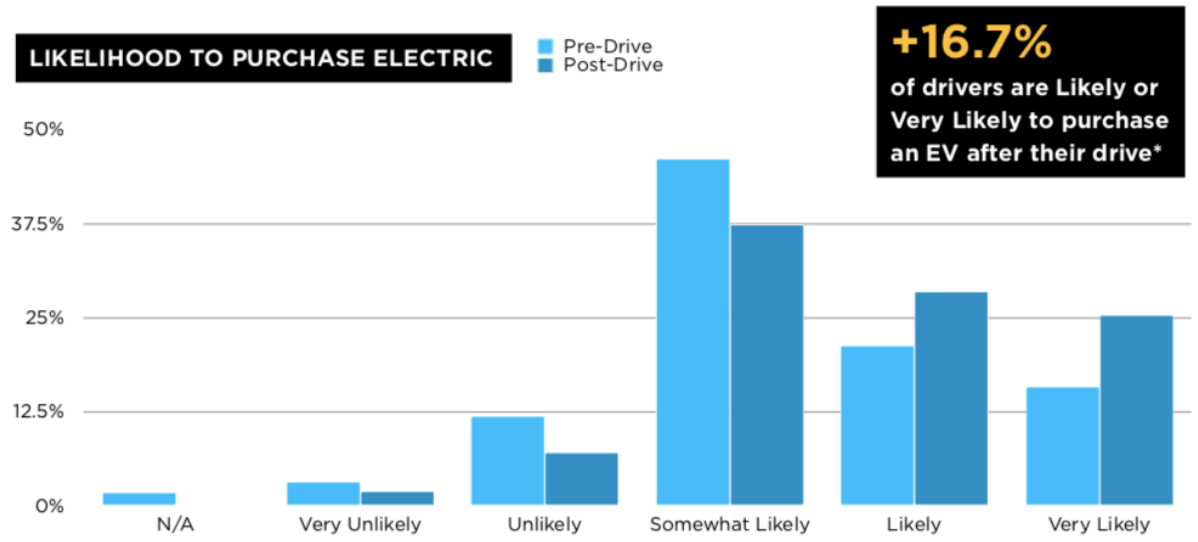

Figure 9: 2018 Smart Columbus Ride & Drive Roadshow Survey

The number of drivers who were “likely” or “very likely” to purchase an EV after their drive increased by 16.7 percent after their Ride and Drive experience.

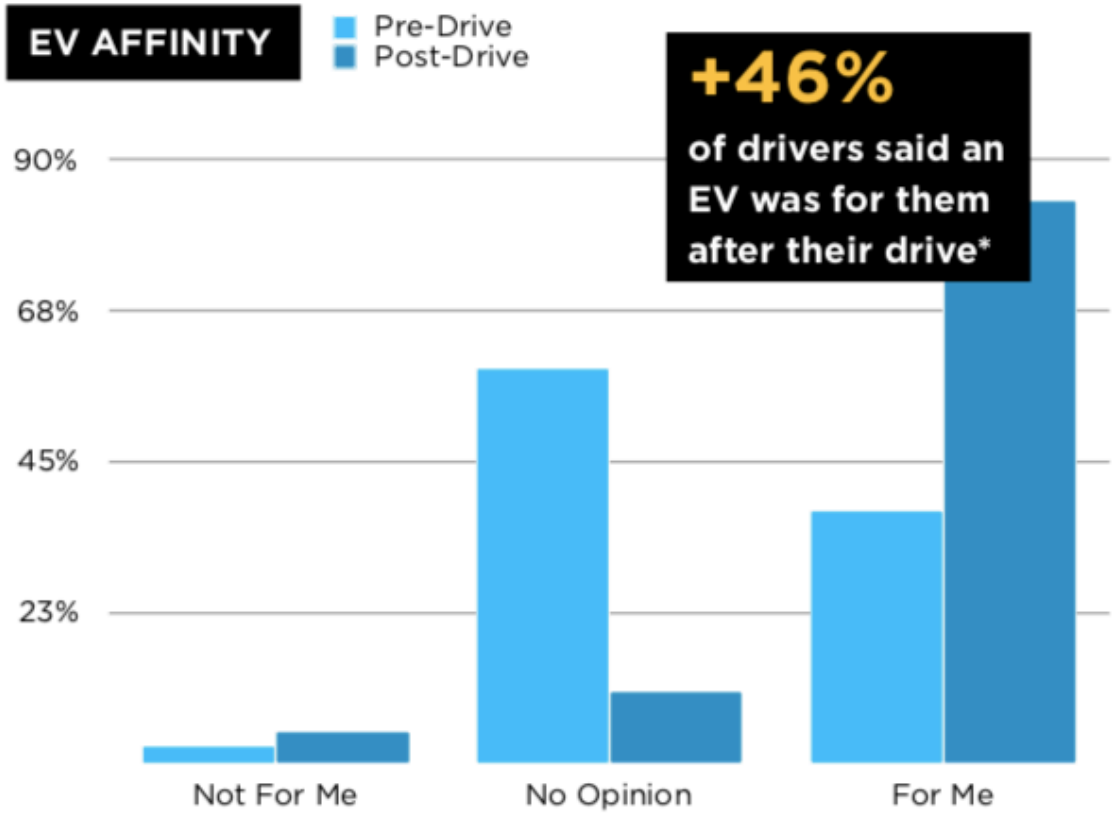

Figure 10: 2018 Smart Columbus Ride & Drive Roadshow Survey

There was also a 46 percent increase in drivers that said “EVs are for me” in post-drive surveys.

3b. CONSIDERATION

Mobility Benefits

Smart Columbus provides training, resources, exposure to smart mobility services, and ongoing coaching to support mobility ambassadors as they develop and launch mobility benefits to incentivize associates to drive less and drive electric. Smart Columbus provides them with tools to measure and track internal EV ownership and reduction in SOV commutes. Ambassadors conduct a plug-and-play survey designed to understand associate commuting behavior and preferences. This data helps partners select the most strategic and impactful smart mobility options to deploy and also provides a baseline to measure success.

Also, Smart Columbus hosts group learning exchanges for peer-to-peer learning and problem solving. There are currently 38 active mobility ambassadors that partners can access as part of the program.

Smart Columbus created the Ignite Action Fund as a tool for Acceleration Partner program participants to fund new incentives and/or projects that motivate respective company associates to drive electric and/or drive less. The purpose of the fund is to accelerate the timeline for launching new mobility benefits by reducing a barrier-cost. The long-term goal is to help employers pilot programs and benefits for employees that can last beyond the funding period.

Organizations that are part of the Smart Columbus Acceleration Partner program with an active senior leader and mobility ambassador are eligible to receive funding. Funding must go towards associates in the central Ohio seven-county region, to align with the Smart Columbus project area. Funds cannot be used for direct company vehicle or equipment purchases. Funding is distributed to partners on a reimbursement basis after a final report and documentation requirements are met.

Some of the mobility benefits deployed in 2018 include:

- The Columbus Zoo used Ignite Action Fund support to launch a comprehensive benefits package rewarding non-SOV commuting decisions with payroll bonuses and additional payroll incentives for commuting bicycle purchases, EV purchases/leases, and at-home charging stations. The Zoo also invested in connecting a multi-use trail to their property to ensure safe commuting options for cyclists.
- Alliance Data leveraged the Ignite Action Fund to deploy a $2,000 incentive to local associates and used their own funds to offer a $1,000 EV incentive to associates nationwide who purchased or leased an EV.
- With Ignite Action Fund support, White Castle subsidized 80 percent of monthly Central Ohio Transit Authority bus pass costs for part-time and full-time associates working in Central Ohio. White Castle also deployed Mid-Ohio Regional Planning Committee’s free Gohio platform to connect associates to carpooling opportunities.
- J.P. Morgan Chase formed an internal work group called the ‘1,000 Car Club,’ which is focused on deploying innovative new solutions to compel 1,000 associates to travel differently to work. Chase was the first Central Ohio company to launch subsidized micro-transit rides for associates via Wi-Fi enabled shuttles.

Consumer Education Campaign

Because car buyers spend an average of 13 hours researching their vehicle purchase online[11], Smart Columbus established the hypothesis that though influencing early adopters in the workplace is vital to achieving our EV adoption goals, we also need to be present online as they take the next step in researching and completing their purchase.

Smart Columbus identified that education and exposure were important objectives for an education campaign, but the most important thing the campaign could do is drive actionable demand for electric vehicles. For that reason, we determined that the most important key performance indicator we would use to measure the effectiveness of the campaign was dealer leads generated—getting local residents to opt-in to being contacted by a local car dealer to discuss a vehicle purchase.

With a budget of $900,000 for an 18-month program, Smart Columbus identified an agency partner that would help execute this program.

Upon consultation with the advisory group, the team mapped several pillars of messaging we wanted to focus on:

- **"Driving REVolution": General information on the benefits of electric vehicles**
- **"Go EVerywhere": Information on charging accessibility and vehicle range**
- **"Budget ReliEVer": Information on EV affordability and purchase incentives**
- **"Driving is BeliEVing": Information on the performance of EVs, and how fun they are to drive**

Some members of our advisory committee did challenge the concept of using the "EV" acronym, asking if it was too much jargon for our audience. However, the Navigant research on Columbus early adopters[9] demonstrated that the early adopters in our target population already had a high level of awareness about EVs, leading Smart Columbus to believe that it is safe to use the "EV" acronym technique with the target audience. However, in markets where EV adoption is more mature, this may not be as viable a strategy.

When producing the creative for the campaign, the team focused on both photography and videography, capturing content of both talent and real EV owners. The content secured was developed into a variety of digital banners, as well as video spots in 15-, 30- and 60-second spots and one nine-minute educational video that leveraged the testimonials of real EV owners from the region.

The campaign was launched in December 2018, leveraging several mediums of particular relevance to our early adopter demographic:
- Local TV
- Streaming TV
- Online digital ads
- Social media ads
- Online search
- Waze navigation

The spots all drive users to the **Drive Electric section** of the Smart Columbus website, where residents can learn more about the benefits of EVs, watch the short and long videos from the campaign, review model information via an EV buyers guide, and most importantly, complete a "Talk to a Dealer" form that creates a lead submitted directly to local dealers for follow-up.

Within its first two weeks, the campaign drove a 95 percent increase in website traffic from within the Columbus region, generating about one dealer lead per day.

4 Creating an EV Sales Environment

Car dealers are critical to the electrification of the transportation sector, which in the Midwest of the United States is primarily personally-owned vehicles. Through discussions with dealers, manufacturers and consumers, Smart Columbus developed the Electrified Dealer framework to create a high-quality sales environment. The Electrified Dealer program launched in August 2018 with 12 regional dealers. As of February 2019, 20 local dealers have been certified in the program.

The key components of the Electrified Dealer certification program include:

Readiness

- Dealers are required to have inventory on lot.
- Dealers must have a live EV charger on site and/or a dummy charger in their showroom that staff and consumers can use to show customers how they will charge the car.
- At least two sales staff must be trained by Smart Columbus on the Smart Columbus program itself and the benefits of driving an electric vehicle. Training occurs twice a year.

Promotion

- Dealers are asked to actively market EVs to increase their visibility beyond what the Smart Columbus program is doing.
- Dealers offer educational material on EVs in their showroom. Smart Columbus will help co-create the educational materials if desired.
- Dealers need to provide an EV owners gift that Smart Columbus created and pays for. This adds to Smart Columbus affinity and adds an extra benefit to those who are buying an EV.

Support

- Dealers share monthly ZIP code, age and gender information for each EV sale made.
- Dealers are asked to consistently engage with the Smart Columbus team to make sure there is program alignment and how to best market EVs to the central Ohio population.

These items allowed the Smart Columbus team to get wider engagement and buy-in from dealers and create a support community around EVs. In exchange, dealers receive the following incentives:

Education

- Free EV sales training, as not all dealers have staff trained on the benefits of EVs.
- Educational material on the benefits of EVs that can be co-branded with the dealership.

Sales

- Leads from more than 6,800 Ride & Drive test drives conducted this year.

Marketing

- Co-marketing opportunities where we co-promote dealer EVs.
- Community-wide recognition as a Smart Columbus partner. This promotes the dealers and drive traffic to their dealerships. This is done on our website, at the Smart Columbus Experience Center and at our Ride & Drive events on corporate campuses

5 Initial Results

In September, October and November of 2018, newly registered EVs were 2.01 percent of all vehicles sold in the Columbus Region—up from .38 percent when the program began. With an end of program goal is 1.8 percent, Smart Columbus is proving that the programs and strategies that target employees of central Ohio's largest employers are aligned with what the public needs to transform their car purchases.

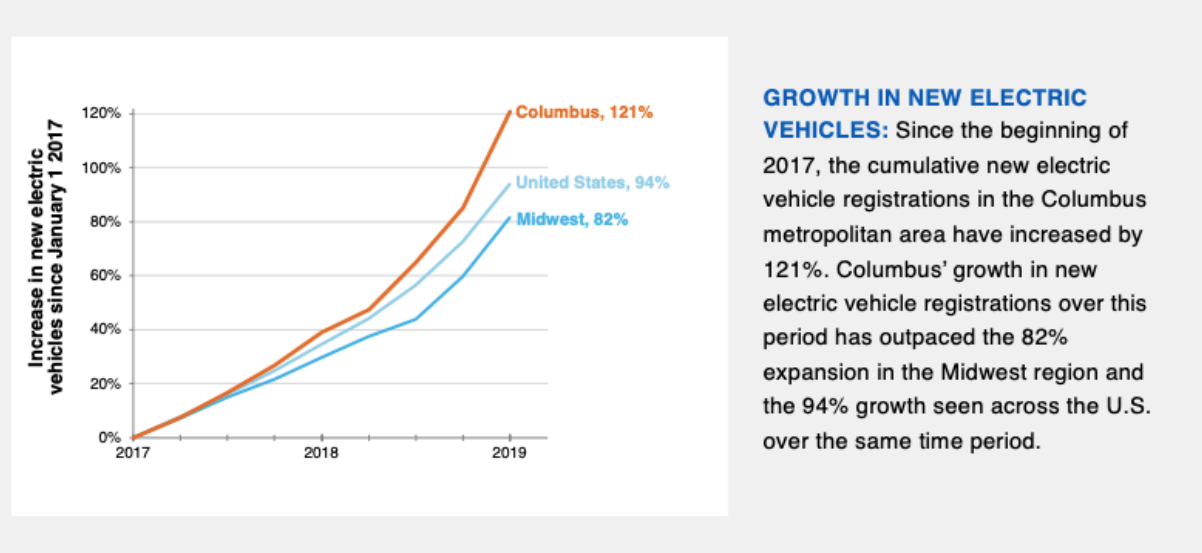

Figure 12: Columbus EV Market Quarterly Progress Update through December 31, 2018 from the Paul G. Allen Family Foundation

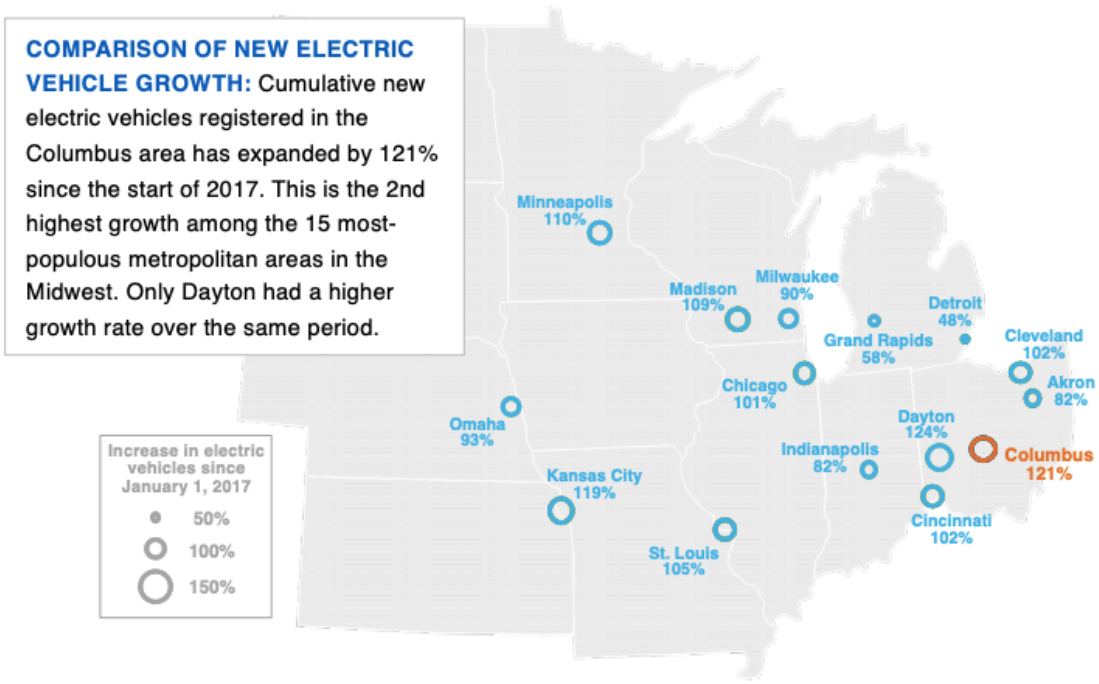

Figure 13: Columbus EV Market Quarterly Progress Update through December 31, 2018 from the Paul G. Allen Family Foundation

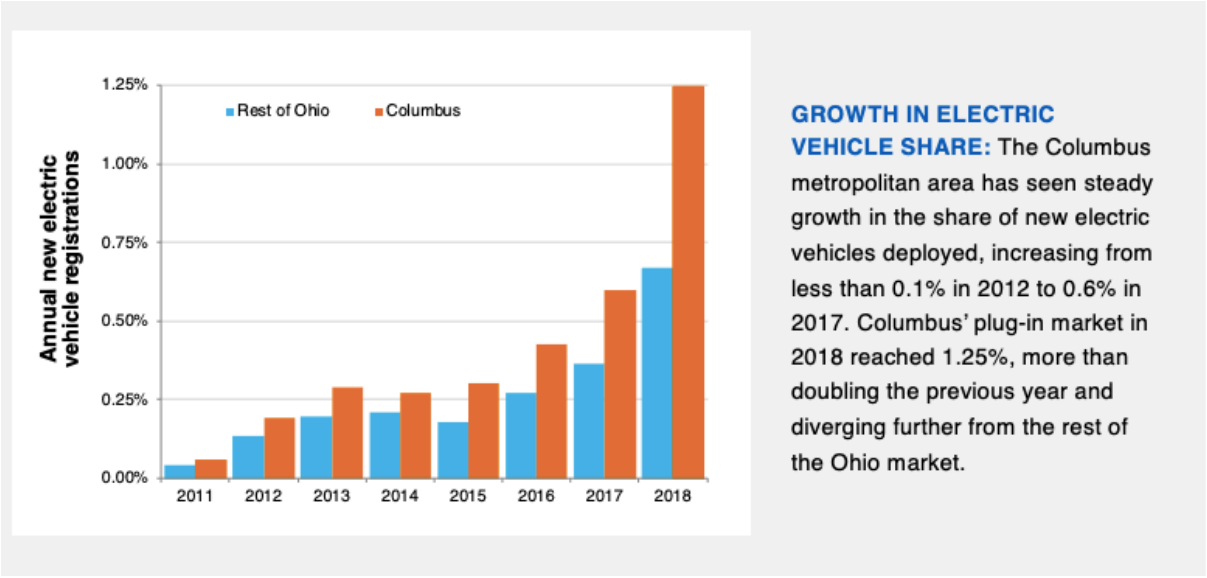

Figure 14: Columbus EV Market Quarterly Progress Update through December 31, 2018 from the Paul G. Allen Family Foundation

5 Lessons Learned

Through the process of developing the consumer EV adoption plan, measuring progress and adjusting our methodology, our team our team identified the following items that may assist others undertaking similar efforts.

Topic	Lessons Learned	Example
Consumer Adoption (Overall)	1. Because the State of Ohio does not utilize a Zero Emissions Vehicle (ZEV) program, the Smart Columbus team has been comparatively handicapped and must develop strategies to influence consumer behavior, as state incentives are minimal. 2. Focusing on the early adopter market was the most appropriate for increasing EV adoption in Columbus.	1a. Strong and active advocacy taken to preserve the Federal tax incentive. 1b. Leveraged relationships and connections to top leadership at OEMs to make the case for why the supply of EVs should be increased for Columbus. 1c. Regular and ongoing meetings with OEMs and dealers were held to monitor inventory levels and advocate for increased supply. 2a. Focused the Consumer Market Assessment baseline survey on the early adopter profile. 2b. Focusing the Consumer Education campaign on the early adopter profile.
Consumer Education	1. Smart Columbus convened a group of industry advisors to inform the development of the EV Consumer Education Campaign. Advisors helped to inform three pillars of messaging: 1) Range and charging availability, 2) Total cost of ownership and 3) Fun to drive.	1a. Creative campaign was calibrated based on advisor feedback to include more people and lifestyle shots.
Ride & Drive Roadshow	1. Encourage multi-driver experiences 2. Invest in hiring more staff instead of relying on volunteers as heavily 3. Driver pre-event education and event details	1a. Multi-driver experience at workplaces builds community enhances experience, increases exposure at each workplace 1b. Drivers can experience multiple types of vehicles (i.e. BEV vs. PHEV) by registering for more than one vehicle in any given day. 1c. By focusing our R&D efforts on large employers can make the most impact we found that many drivers invite their coworkers to ride along with them when they schedule their drives. Ultimately, if there is more than one driver in a vehicle, drives are directed so drivers can safely switch spots with other riders during the route. 2a. Conducted multiple trainings

		with paid product specialists and provided opportunities for feedback to empower them with all the knowledge of EVs and Smart Columbus. 3a. Pre and post drive emails have been updated to ensure drivers are prepared for their drive and have access to educational content on charging, etc. This primes the driver to get even more out of the experience because they have a foundation of knowledge.
Mobility Benefits	1. Each individual workplace/company engaged in the program has its own approach to getting things done inside the organization, but consistently we have found: • Large companies are bureaucratic and there are many levels of engagement and buy-in needed to make a decision. • Companies have internal experts with existing points of view – senior leadership is essential to driving change and embracing new approaches.	1a. To be an Accelerator Partner, you must have endorsement by the CEO to engage in the work and a Senior Leader must serve as the sponsor of the company's engagement. 1b. Established the Ignite Action Fund to expedite decision-making and generate early wins inside the organizations to catalyze additional investment. 1c. Worked with four companies to launch an EV rebate program leveraging the Ignite Action Fund. Additional funding proved a successful method to increase associate EV adoption on an accelerated timeline.
Electrified Dealers	1. OEMs have varying approaches and beliefs on how to best market, educate and sell EVs. This manifests itself in their approach to dealer training (i.e. some brands intentionally avoid all conversation about charging, while others embrace it and ensure it is a part of their conversation with every customer). 2. When a sales lead is generated by Smart Columbus through a Ride & Drive event or other interventions, the turnover of the lead is critical, but it needs to be done thoughtfully.	1a. More comprehensive EV dealer trainings to be conducted by Smart Columbus. 1b. Participation required to be a Smart Columbus Electrified Dealer. 2a. Bought an FTP site for secure transfer of contact information. 2b. Conducting direct follow-up with OEMs and dealerships to ensure sales leads are received and follow-up is being conducted.

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Authors

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Mark Patton is a Vice President of the Columbus Partnership, and co-leads the Smart Columbus initiative. Prior to joining the Partnership, Mark was the President of FactGem, a data analytics platform for customer intelligence. Mark is a native of the West Coast and moved to Ohio in 2011 to help establish JobsOhio, the state's private economic development organization, where he was the Senior Managing Director. Earlier, Patton held senior roles in both sales and marketing organizations with corporations, including Procter & Gamble, Apple Computer and Eastman Kodak. Prior to moving to Ohio, Mark spent the previous 15 years leading technology start-up companies in Silicon Valley. Mark received his bachelor's degree from the University of Washington and completed a marketing management program at Stanford University.

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Donna Marbury has more than 15 years of experience as a multimedia content creator, social media strategist and journalist. Prior to joining Smart Columbus in July 2018, she launched the social media program at STRS Ohio, where she won the 2018 Central Ohio PRSA Award of Excellence for best Facebook page. She also revamped web content and social media strategy at OhioMeansJobs-Franklin County and worked as an editor and communication strategist for Who's Who Publishing and the Ohio Chamber of Commerce. Donna is a freelance journalist for B2B publications, including Managed Healthcare Executive and Medical Economics magazines. Donna has a master's degree from the Medill School of Journalism at Northwestern University, and a bachelor's degree in English and professional writing from Wright State University.