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# ELECTRIFYING RIDE-HAIL SERVICES

A case study on Maven Gig's use of Chevrolet Bolt EVs

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Partnerships that electrify ride-hail services are a promising way to reduce greenhouse gas emissions from light-duty vehicles and improve the business case for fast charging services. Much like the personal vehicle market, the high upfront costs of electric vehicles (EVs) and access to charging infrastructure is a barrier to EV ownership within the ride-hail driver community. Maven Gig, a mobility service provider, offers Chevrolet Bolt EVs for rent to ride-hail and delivery drivers, and through a partnership with EVgo, these drivers have access to unlimited charging at EVgo DC fast charging stations as a limited time benefit. The rental arrangement alleviates the high upfront cost burden of EVs and the drivers have predictable operating costs since unlimited charging services are currently included in the weekly rental fee. The EVgo partnership both addresses the charging demand access issue for Bolt EV drivers and improves the business case for fast charging service providers.

Since launching the Maven Gig service in 2017, the Bolt EVs have been a popular vehicle on the platform with over 21 million electric miles driven through August 2018. Offering Bolt EVs is also promising way to expose both the Maven Gig drivers and their passengers to EVs, a benefit to Maven's parent company, General Motors.

This case study on Maven Gig is a part of "Making the Business Case for Smart, Shared, and Sustainable Mobility," a project which aims to accelerate the adoption of electric vehicles in shared mobility services and to establish best practices that can be used by other public agencies around the United States.

## INTRODUCTION

Four U.S. cities have joined together to demonstrate the potential for electric shared mobility services. "Making the Business Case for Smart, Shared, and Sustainable Mobility Services" (EV Shared Mobility) aims to accelerate the adoption of electric vehicles (EVs) in shared mobility applications and to establish

FIGURE 1: EV SHARED MOBILITY PROJECT



best practices that can be used by other municipal and regional governments and businesses around the United States. The project, led by the City of Seattle and Atlas Public Policy, brings together the U.S. Department of Energy's Energy Efficient Mobility Systems program and major industry stakeholders with the cities of New York, Denver, and partners in Portland (OR) to test different interventions designed to increase the adoption of EVs in shared mobility services. Visit [www.evsharedmobility.org](http://www.evsharedmobility.org) to learn more about the project.

Each project partner in the four cities will test a market intervention and analyze its impact on EV adoption and electric vehicle miles traveled for carshare and/or ride-hail services.

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A major part of the project is to share the results, successes, and lessons learned through these pilot programs. The project partners will not only facilitate the implementation of EVs and EV infrastructure for the programs, but they will also evaluate the policies and programs that were employed during the project period.

To inform the project development, the project team has prepared case studies to assess previous and ongoing efforts to electrify shared mobility services. This case study focuses on Maven Gig's electrification of ride-hail services through its introduction of the Chevrolet Bolt EV. A second case study assesses the efforts of the carshare company car2Go to electrify shared vehicles on their platform.

## BACKGROUND

The transportation sector generated 27 percent of greenhouse gas (GHG) emissions in the United States in 2015 of which, the light-duty vehicle sector was responsible for 60 percent of the emissions [1]. Electrification of light-duty vehicles can reduce GHG emissions as driving a battery electric vehicle results in fewer lifecycle GHG emissions than driving a gasoline vehicle with a fuel economy of 80 miles per gallon (on average across the United States) [2].

With shared mobility growing in popularity [3, 4, 5], electrification of these services can further help cities and states reduce their GHG emissions generated by light-duty vehicles. Within the shared mobility space, ride-hailing platforms, like Uber and Lyft, allow users to request a ride on-demand through a mobile application and specify their desired pick-up and drop-off locations. Ride-hail drivers either use a personal vehicle or rent one for a daily or monthly fee through a service such as Maven Gig. Multiple aspects of ride-hail services support the case for their electrification, including:

- **High-Mileage Vehicles:** When paired with a robust, comparably-priced charging infrastructure network (not presently available for drivers,) the high mileage nature of ride-hail vehicles improves the total cost of EV ownership [6].
- **Shared Vehicle Trips:** Pooled rides can greatly increase the efficiency of these services and, along with electrification, are a core part of the ride-hail providers' long-term vision for their platforms [7].
- **Connecting Electric Mobility to Transit:** Electric shared mobility trips, when serving as a first or last mile connection to high capacity transit, while helping achieve broader mobility and congestion management goals.
- **High Technology Turnover:** The high mileage of these vehicles increases the turnover rate for vehicles obtained through mobility companies, which can quicken the transition to newer, more affordable EVs.

Direct current (DC) fast charging (also referred to as "fast charging") is critically important to ride-hail drivers. DC fast charging infrastructure has the added benefit of creating an anchor tenant for charging infrastructure providers and is a promising way to improve the business case for these services [8]. Since ride-hail drivers only earn income when providing rides, time spent charging must be minimized. Accessible, available fast charging is needed to support EV ride-hail drivers.

Access to electric vehicles is commonly cited as a barrier to electrifying ride-hailing services, particularly for low-income drivers that do not have the capital to purchase a new vehicle or access to supporting charging infrastructure. Maven ([www.maven.com](http://www.maven.com)) is a mobility platform backed by General Motors (GM)

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that offers short or extended rentals of GM vehicles for commercial use. The Maven Gig program launched in 2017 is designed specifically to provide flexible vehicle rentals for ride-hail and delivery service drivers. Through the Maven app, renters pay a flat weekly rate that includes unlimited miles, maintenance, and insurance coverage for permitted uses of the vehicles. Maven Gig drivers can rent a vehicle for as little as one week. The Maven Gig website lists rental prices starting at \$199 per week for gasoline-powered vehicles of different sizes and starting at \$229 per week for a Bolt EV [9]. Gasoline drivers cover fuel costs while renting the vehicle.

For the Bolt EV, the weekly rental rate currently includes the cost of charging at any EVgo charging station, as well as through select regional charging networks such as Austin Energy's Plug-In Everywhere network. Unlimited charging on a public network is one of the key benefits encouraging customer adoption. While the Bolt EV has a range of 238 miles on a full battery charge, the average daily mileage by Maven Gig drivers is typically over 125 miles. Furthermore, many Maven Gig EV drivers do not have access to charging at home, so drivers need to charge daily and must plan for when, where, and how they will charge.

## LAUNCHING THE BOLT EV ON MAVEN GIG

Offering EVs on the Maven Gig platform further advances GM's vision to provide a transportation future with "zero crashes, zero emissions, and zero congestion." The company strategy to achieve this vision is to develop and deploy a shared, electric, and autonomous vehicle fleet [10]. Providing EVs on the Maven Gig platform also allow GM and Maven to try and establish a successful business model for the shared, electric, and autonomous future the company envisions [11].

There are also business adjacencies. For example, by putting EVs on high-mileage platforms like ride-hailing and delivery services, the engineers at GM can witness the impact of high-use wear and tear on the EV battery and use learnings to work toward improving the vehicle. Additionally, because the vehicle is being rented, drivers are able to participate in extended EV "test drives." This EV exposure extends beyond ride-hail drivers to include the passengers they pick up. The experiential learning and word-of-mouth marketing are potentially important parts of the business model.

The primary concern for Maven Gig when launching the EVs in a shared-use application was whether there was enough charging availability to support EV drivers, especially fast charging. The company assumed most Maven Gig drivers would not have access to charging at home, which they later validated through driver surveys [11]. This supported the company's need to develop a seamless approach to charging for Maven Gig customers. To address charging challenges, Maven partnered with the charging provider EVgo to offer their EV drivers unlimited access to the fast charging stations on EVgo's network. As of September 2018, EVgo had the largest publicly accessible fast charging network in the United States (excluding Tesla). Since EVgo owns and operates the equipment, they are able to manage pricing and ensure station uptime, which provides cost certainty for the Maven Gig program.

In the first half of 2017, the Bolt EVs were introduced on Maven Gig's platform in three California cities with the most available charging infrastructure: Los Angeles, San Diego, and San Francisco (see Table 1). Uncertain of the impact to infrastructure utilization, the EV fleet deployments were managed in each city to provide adequate support for all EV drivers.

TABLE 1: INITIAL LAUNCH MARKETS FOR THE BOLT EV ON MAVEN GIG'S PLATFORM

City	Bolt EVs at Initial Launch	Total Fast Charging Ports (January 2017)	EVgo Fast Charging Ports (January 2017)
Los Angeles	~50	108	79
San Diego	~40	29	25
San Francisco	~100	91	60

*Fast charging ports are those that work with the Bolt EV and are located in the Combined Statistical Area for the city.*

*Source: [12, 11]*

Many EV programs to date have relied on government policies, regulations, or incentives to launch. Maven Gig's initial launch did not. Maven has a goal of building a long-term, sustainable business model for transportation electrification and has not relied on these types of incentives. Furthermore, they are subject to change and can be ended unexpectedly. Ahead of launching EVs in a new market, Maven engages with the city officials and electric utilities involved with vehicle electrification and public charging. Cities that are more actively engaged with electrification can help bolster the goals of Maven Gig. Additionally, the company coordinates with their infrastructure partners, including EVgo, before launching EVs onto their network in the new market [11].

Maven Gig avoids extensive EV-specific outreach or advertising so as not to overwhelm potential EV drivers with information that could deter them from trying the vehicles. When EVs are made available, they rely on the typical customer process to discover the EVs through the app like any other vehicle. If Maven Gig drivers use an EV for the first time, Maven guides them through some extra training at the time of the rental, including a video and in-person instruction on charging etiquette and charging speed.<sup>1</sup> Much of the initial outreach happened through word of mouth among Maven Gig drivers, which Maven found to be an effective way to maintain a high utilization of the Bolt EVs. The EV drivers were quick to learn how best to use an EV during the rental period. Maven also created a closed Facebook site for Bolt EV drivers to allow drivers to educate each other and provide a forum for informal dialogue without input from Maven.

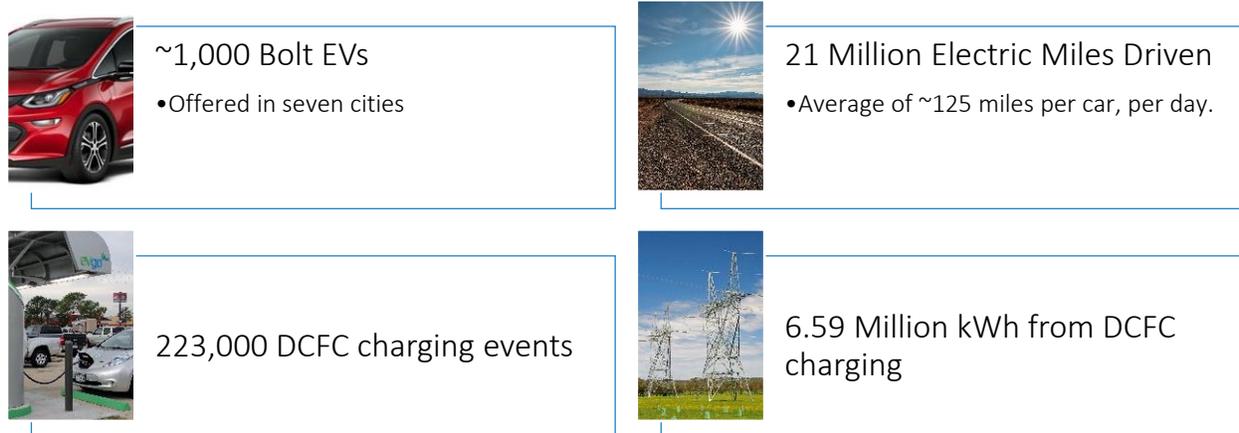
## EVALUATING THE SUCCESS OF EVS ON MAVEN GIG

Maven uses metrics such as those detailed in Figure 2 to evaluate the success of its EV market segment. Based on those numbers, Maven continues to expand the EV offerings, reaching about 1,000 Bolt EVs on the platform as of August 2018 in seven markets: Austin, Baltimore, Boston, Los Angeles, San Diego, San Francisco, and Washington, DC.

<sup>1</sup> For many EVs, including the Bolt EV, charging speed slows down when the battery capacity reaches 80 percent.

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FIGURE 2: SUMMARY STATISTICS FOR EVS ON MAVEN GIG THROUGH AUGUST 2018



Summary statistics for Bolt EVs on Maven Gig. A majority of DCFC charging events occur on the EVgo network.

Source: [11]

Increasing customer adoption of EVs was a broader GM goal and getting drivers and their passengers into EVs has proven to be a valuable way for the Bolt EVs to gain exposure. Maven Gig drivers have become advocates for the Bolt EVs making it one of the most popular vehicles on the platform. Key attributes for this success include the benefit of including access to charging in the weekly rental and the drivers' own passenger feedback [11].

Maven also hoped to demonstrate a consistent demand for public charging to encourage more infrastructure deployment by charging service providers. Its drivers mostly charge the Bolt EVs at public EVgo stations, though a small percentage charge at home and smaller percentage charge at non-EVgo charging stations (costs not covered by Maven Gig).

EVs on the Maven Gig platform are in high demand. The summary statistics on their use support the company's success in achieving its goal to increase customer EV adoption and showing high utilization of public charging infrastructure (see Figure 2). The summary statistics demonstrate the large demand, high mileage, and massive charging requirements for EVs on Maven Gig's platform.

## FINDINGS AND LESSONS LEARNED

Launching and expanding Bolt EVs on the Maven Gig platform is an ongoing process that required thoughtful implementation and resulted in valuable lessons learned.

First, Maven Gig's service has expanded transportation electrification to a broader cross-section of society and helped to dispel the myth that EVs are only for the wealthy. Showing the reach and success of Maven's efforts can encourage greater cooperation from city governments and is an important part of Maven Gig's value proposition when entering a new market. Although the company does not rely on policies and incentives, having the support of local government, utilities, and other entities is critical to the long-term success of the EV offerings on Maven Gig.

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Second, fast charging infrastructure availability is the most important factor affecting expansion of EV fleet offerings on Maven Gig, and Maven aligns its launch and deployment strategies with each city's fast charging availability. Fast charging infrastructure in Boston, for example, is not as widespread as in other urban centers, so Maven has limited ability to expand EVs in that market. Maven remains in discussions with key Boston stakeholders, including working closely with Eversource (the regional electric utility) and EVgo to help grow the network [11]. In California, while a relatively larger infrastructure network is available, Maven believes further fast charging infrastructure is necessary to scale EVs to meet California energy and environmental goals. Austin is a unique case as it is the only Maven Gig fleet that is all-electric. In Austin, Maven formed partnerships with both Austin Energy and the City of Austin, who are both active in transportation electrification and charging deployment, pushing forward Austin's smart mobility roadmap [13]. Maven launched in Austin with 20 Bolt EVs in early 2018, which can charge at both Austin Energy's Plug-in Everywhere network and the EVgo network.

Maven Gig drivers must have reliable access to fast charging or even dedicated use of the equipment, if possible. There is an opportunity cost for drivers when they wait for or search for charging while driving on ride-hailing platforms. Maven's current experience has found that one DC fast charging station is likely to support to 10-12 vehicles per day in high-mileage, shared-use deployments, perhaps more if the charging station is dedicated and/or technology is used to manage the fleets [11]. Given this ratio, most cities do not have enough fast charging to support rapid electrification of ride-hail vehicles. For example, if there are 45,000 Uber or Lyft drivers in San Francisco, and 1/16<sup>th</sup> were electrified (2,800), there would need to be approximately 280 DCFC in the city [3]. Currently there are only 35 DCFC ports in the city [12].

Maven Gig is pushing the development of charging infrastructure in regions where they offer Bolt EVs and regions they hope to expand EV offerings to in the future. Maven Gig can act as a reliable anchor tenant for charging providers looking to expand fast charging networks which depend on high utilization [8].

Finally, ensuring Maven Gig's EVs have a long-term sustainable business model is an important aspect of the program. Maven finds that the Bolt EVs tend to be rented for longer periods of time than gasoline-powered alternatives, supporting the company's business case for EV fleets as the vehicles are not sitting unused. Making the business case for a ride-hail vehicle rental model was a major goal for Maven Gig. The success of using EVs in Maven Gig will depend on the development of fast charging infrastructure and other market factors that encourage adoption and improve driver economics. This is likely accomplished through continued collaborations with government entities, electric utilities, private companies, and community groups. For example, in Boston, EVgo, Maven, and Eversource, have an agreement to coordinate the deployment of charging in the region through Eversource's grid modernization program [11]. This is one way that Maven is trying to create a win-win-win environment for all parties who are pursuing similar goals.

## FUTURE PLANS FOR EVS ON MAVEN GIG

Maven plans to continue to invest in the electrification of its Maven Gig program. In April 2018, Maven and EVgo expanded their partnership with EVgo's announcement of a plan to build a network of dedicated DC fast charging stations for Maven Gig EV drivers. The dedicated network is important for Maven Gig drivers who need charging to be both available and fast in order to maximize their time spent on trips. The companies are testing the hypothesis that dedicated charging hubs will expose new learning and

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utilization patterns that could further drive fast charging development. The dedicated network may also present additional vehicle-grid integration opportunities.

Maven Gig EVs will continue to be offered, including as part of the EV Shared Mobility project. Maven and EVgo will be project partners to launch Maven Gig with Bolt EVs in New York City and Denver. They will deploy up to 150 Bolt EVs in each city on the Maven Gig platform over the course of the project. EVgo will deploy DC fast charging stations in each city for unlimited, dedicated use to Maven Gig EV drivers for one year. As these will be new to each city, the project will attempt to track EV utilization and charging behavior to assess customer satisfaction with the EVs and how well the unlimited and dedicated charging works in each city.

Maven Gig hopes to continue to build a sustainable business model that includes EV fleets.

## CONCLUSION

Maven has paved the way for deploying EVs in ride-hailing spaces. Their experience confirms customer demand for EVs and a path towards a sustainable business case for charging provided continued market development, demonstrating that renting EVs to ride-hail drivers can work. Bolt EVs on Maven Gig are one of the platform's most popular vehicles. Offering Bolt EVs on the platform is one way to expose both the Maven Gig drivers and their passengers to EVs. However, this is not possible without adequate access to fast charging for the EVs. Maven's partnership with EVgo to provide access to unlimited fast charging and include the cost of charging in the flat rental fee was an effective way for Maven to address the charging demand and access issues of their EV drivers. From Maven's experience, it is clear that developing partnerships with private companies, cities, and electric utilities for charging is critically important to making the business case for electrified shared mobility.

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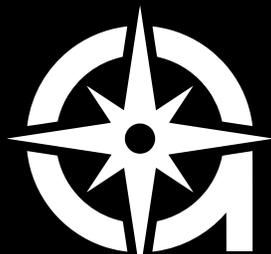
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