

## MEMORANDUM

**TO:** Downtown Mobility Authority (DMA) Board of Directors

**FROM:** Planning and Development Staff, the Downtown Memphis Commission

**DATE:** May 11, 2021

**SUBJECT:** EV Charging Recommendations for DMA Facilities

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### I. RECOMMENDATION

With electric vehicles (EVs) becoming increasingly prevalent, staff recommend the adoption of EV standards for future DMA-affiliated parking facilities Downtown. The dual goals of this policy are to 1) increase the total number of “EV-ready” parking spaces Downtown, and 2) increase the total number of EV charging stations Downtown as demand continues to grow.

Creating an EV-ready parking space means taking steps to ensure that it is easier to install a new charging station in the future by including the needed infrastructure and mechanical equipment, including electrical panel capacity, conduit, and full-circuit charging infrastructure. This preparation and advance planning can make installation of future charging stations easier and less expensive. New public garages should be designed and ultimately built with a minimum number of these spaces.

There are 14 existing Level 2 EV chargers currently in operation at seven DMA garages: two at Shoppers Garage, two at Riverfront Garage, two at the Justice Center Garage, two at Barboro Flats Garage, four at Peabody Place Garage, and two at Once Commerce Square Garage. Because the existing chargers at these locations are not yet showing high levels of utilization, staff does not recommend installing additional chargers at this time. Instead, regular analysis and reporting are recommended on the usage of EV chargers at DMA-affiliated garages, so that when utilization rates approach the necessary threshold to warrant more EV charging stations, staff are able to move forward with partners and increase supply. Additionally, staff will take immediate steps to more proactively market and promote the availability of the existing chargers using temporary signage, social media tools and the DMC website.

Based on best practice research, staff recommends that the DMA set the following standards:

- The number of EV-ready spaces for new DMA-affiliated garages should be no less than 5 percent of the facility’s total number of available parking spaces, with electrical panel and conduit capacity installed during construction to support the future operation of a Level 2 charger.
- Existing EV charger usage will be reviewed by staff every 6 months to determine demand growth and prepare for the addition of new chargers when warranted.

## II. BACKGROUND

There are more than 1.7 million electric cars currently registered in the United States, nearly 13,000 of which are in Tennessee. The Tennessee Department of Transportation confirmed that at the end of 2020, 11,034 light-duty electric vehicles (EVs), both fully electric and plug-in hybrids, were registered across the state. Electric vehicle registrations specific to Shelby County have steadily increased over the past few years, from 865 in 2018 to 1,679 in 2020.<sup>1</sup>

There are two types of EVs – fully battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), which have a gasoline-fueled engine as a backup power source for when the electric battery is depleted. Both types require plug-in charging facilities. While EVs have a higher sticker price than gasoline or diesel-powered vehicles, they require much less maintenance with fewer moving parts, and over the years save their owners thousands in fuel costs. EVs are quick to accelerate, provide air-quality benefits, reduce noise, and reduce greenhouse gas emissions. Newer technology has made charging faster and easier, battery costs more affordable, and electric-vehicle miles (or the range per charge) last longer.

Globally, electric cars accounted for 2.6 percent of car sales in 2019, a 40 percent increase from 2018, and sales are only expected to increase thanks to rebates and incentive programs.<sup>2</sup> In the United States, consumers are eligible to receive up to a \$7,500 tax credit for switching to electric. The Biden Administration has vowed to replace all federal fleets with electric vehicles, some 645,000 cars, trucks and vans, and is developing a “cash-for-clunkers” style program for additional incentives to ensure that all cars on the road are electric by 2040. The Administration has also pledged to add 550,000 EV charging stations to public access, mainly along highways.<sup>3</sup>

It’s difficult to pinpoint exactly how many EVs to plan for in the coming years, but ensuring that adequate charging infrastructure is available by making new investments is a sound decision for cities. Ford and General Motors are both committed to increasing EVs on the road, with a dedicated \$22 billion and \$27 billion in spending promised for electric vehicle development through 2025, respectively. General Motors has also pledged to have 30 EV models on the market by 2025, two thirds of which will be available in the United States.<sup>4</sup>

## III. ANALYSIS

Locally, the Tennessee Valley Authority is partnering with municipalities, automakers, and power companies (including MLGW and MATA) with a multi-year plan to increase EVs on the

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<sup>1</sup> Information provided by Allison Raymer, Director of Vehicle Services Division, Tennessee Department of Transportation.

<sup>2</sup> From the Electric Vehicles Initiative report, *Global EV Outlook 2020*: <https://www.iea.org/reports/global-ev-outlook-2020>

<sup>3</sup> More information on federal plans for infrastructure and clean energy: <https://joebiden.com/clean-energy/#>

<sup>4</sup> Ford and GM are just two manufacturers that are increasing their investment in EV technology. <https://www.caranddriver.com/news/a34730248/gm-accelerates-electrification-plans/>

road by more than 200,000 by 2028, with Level 3 fast charging stations located every 50 miles along major highways.<sup>5</sup> While most consumers will charge an EV at home, there is a gap in charging infrastructure to support future needs to power the expected 3 million electric vehicles by 2025. The International Council on Clean Transportation (ICCT) estimates that Memphis has enough existing charging facilities to cover between 60-70 percent of the area's demand for public and workplace EV charging over the next three years.<sup>6</sup>

Public chargers are needed to build out the charging network and accommodate the expected growth of EVs, but costs vary based on the level of charger. The higher the level, the more expensive the infrastructure and installation. Level 1 chargers that plug into a standard outlet cost around \$300-\$600, but take nearly all day to charge. Level 2 chargers cost roughly \$500-\$700 for the station, and installation can cost an extra \$1,000-\$2,000 or more. Level 2 chargers can fully charge a depleted battery in 5-7 hours. Finally, Level 3 chargers are the most cost-prohibitive, between \$120,000 and \$260,000 for the station and installation. A Level 3 charger can power an EV battery to 80 percent in about 10 minutes.

According to PlugShare.com, there are approximately 136 charging stations in the Memphis area, the majority of which are Level 2 chargers, able to fully power a standard EV in about seven hours. In comparison, the Nashville-Murfreesboro-Franklin area contains 651 chargers, Knoxville has 174, and Chattanooga has 138.<sup>7</sup> Level 2 chargers (208/240 volts) are the most common at public facilities, while Level 1 Chargers (110/120 volts) are typical for home use and can be plugged into a standard wall outlet. Level 3 chargers offer the quickest and most powerful charge (as high as 800 volts), and are not compatible with all vehicles.<sup>8</sup>

EV charging destinations include hospitals, town halls, bus stations, airports, pharmacies, restaurants, stadiums/arenas, and cinemas – all areas where a driver may stay for a substantial amount of time. Currently, there are 14 Level 2 electric chargers at seven DMA-affiliated parking garages. First Park Place does not have charging stations as it was acquired by the DMA after the stations were installed in 2012, and Peabody Place Garage has four chargers.<sup>9</sup> Twelve of the charging stations are owned and operated by Blink Charging, who operates an additional two stations in the Medical District at 20 S. Dudley.

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<sup>5</sup> See the TVA's Electric Vehicle vision at <https://www.tva.com/energy/technology-innovation/electric-vehicles>

<sup>6</sup> To read the ICCT whitepaper, *Quantifying the Electric Vehicle Charging Infrastructure Gap Across U.S. Markets*, visit [https://theicct.org/sites/default/files/publications/US\\_charging\\_Gap\\_20190124.pdf](https://theicct.org/sites/default/files/publications/US_charging_Gap_20190124.pdf)

<sup>7</sup> Plugshare.com is one of several trip-planning online tools where drivers can map locations of different types of EV chargers.

<sup>8</sup> Level 1 and Level 2 chargers are indirect chargers, and charge to an on-board capacitor that transfers power to the battery. Level 3 chargers directly charge to the battery.

<sup>9</sup> First Park Place is located at 21 S. Second Street. The chargers at One Commerce Square are operated by SemaConnect. The locations of all DMA-owned or managed garages can be found at <https://downtownmemphis.com/about/boards/downtown-mobility-authority/>

According to Blink, a charger is considered profitable if it is used for 2 hours daily, or 60 hours a month. The most profitable and utilized garage in the DMA group, Barboro Flats Garage, does not meet that metric.<sup>10</sup> At 60 hours of charging per month, a charger would generate around \$2,500 revenue annually to be deemed profitable. For the twelve Blink chargers, a fully-utilized system would generate \$30,000 a year. Since their installation in 2012, the Blink chargers at DMA-affiliated garages have generated \$7,482 total charging revenue.<sup>11</sup>

#### **IV. PROPOSAL**

Until there is a higher utilization rate at current Downtown charging locations, it is not time to add additional chargers to the network. This will change. The ICCT estimates that the number of EVs supported by existing chargers will increase by 35 percent for public Level 2 chargers, and by 65 percent for DC Fast Chargers, by 2025. With the certainty that demand will increase, there ways to prepare the Downtown parking ecosystem for future EV charging needs.

Markets similar to Memphis have passed ordinances that require all new garages to have a certain amount of EV chargers installed on site, with supporting conduit installed for increased future capacity. St. Louis recently passed three ordinances, stating that as of January 1, 2022, new construction and renovation projects of residential and commercial buildings must be EV-ready by including accommodation for chargers as part of construction.<sup>12</sup> Requirements include EV-ready parking for single-family homes, 5 percent EV-ready spaces and 2 percent electric vehicle supply equipment (EVSE) installed spaces (meaning the spaces have chargers ready to be used) at all multi-family residential and non-residential new-construction buildings with more than 50 parking spaces. In 2025, the requirement increases to ten percent EV-ready spaces at multi-family residential constructions.

A similar plan and timeline should be considered for Downtown Memphis. Key requirements would be to increase the number of EV-ready spaces by adding electrical panel capacity, conduit, and full-circuit charging infrastructure at all new garages covering 5 percent of the total parking spaces. That goal should increase over time as the current EV-charging stations reach their capacity and additional stations are required to meet demand. Existing chargers should be monitored for increased usage on a regular basis, so that staff are ready to recommend adding more chargers when the utilization threshold is reached.

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<sup>10</sup> In 2021, Barboro Flats chargers were used eight times in January, nine in February, three in March, and three in April. Kris Kentera, who provided the information, is the Executive Sales Manager for West Tennessee at Blink.

<sup>11</sup> EV charging utilization is typically measured based on the number of kilowatts generated, but Tennessee measures charges through a time-based method, at \$.03 every thirty seconds. The state is transitioning to a kilowatt-based measurement as time-based does not generate the same revenue. When this takes place, there will be a significant increase in revenue.

<sup>12</sup> Board Bills 162CS – Electric Vehicle Charging Equipment, 163CS – EV Ready, and 181 – Electric Vehicle Charging Equipment Codes. More information about the ordinances can be found at <https://www.stlouis-mo.gov/government/departments/planning/sustainability/documents/upload/EV-Ordinances-Overview-final.pdf>.