ELECTRIC VEHICLE CHARGING INFRASTRUCTURE ANALYSIS

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Electric vehicle (EV) usage and ownership is increasing across the country. By 2030, 50% of all cars sold will be EVs, as mandated by the Biden Administration (The White House, 2021). As more residents and visitors depend upon EV for their daily transportation needs, cities need to be ready to support this shift with EV charging infrastructure (a.k.a. electric vehicle supply equipment or EVSE). Many residents will depend upon home charging to power their vehicle(s), however, in denser urban areas and in areas without access to garages, public chargers located in the right-of-way will be an important tool to ensure equitable access for all residents.

The City of Dayton is committed to improving sustainability outcomes for our community, and EVs are a component of the City’s strategy. In terms of internal city operations, the City is converting its entire municipal fleet of vehicles to electric by 2035. Out in the community, the City is installing EV chargers at public buildings and City-controlled parking garages and supporting installations on private property. However, we recognize the need to have a clear strategy that equitably provides access to EV infrastructure throughout the city.

As the need for EV infrastructure increases, federal and state funding programs continue to grow to support this national shift. The City will need to utilize all available funding programs to transform the way our community travels. This report provides an overview of the analysis conducted to determine prioritized EV charging locations across the city. The analysis places an emphasis on determining the areas of highest need, ensuring equitable placement of infrastructure, and leveraging City owned-properties to encourage additional private investments.

This report shares the geographic analysis the City conducted on existing EV charging stations in the Dayton area. It identifies easy wins for the City’s initial investment in EV infrastructure and highlights areas of opportunity for both publicly and privately funded chargers.
Dayton’s existing EVSE is concentrated in the urban core, with most installed on private property. Of the seventeen (17) existing chargers, only two (2) are owned and managed by the City of Dayton - one in the public right-of-way at 221 N. Patterson Blvd. and the second in the City Hall garage. All existing chargers are level two.
The Office of Sustainability conducted two public meetings during which they provided information on electric vehicles, EV charging stations, and the future infrastructure investment needed to support a city-wide shift from gas-powered vehicles to electric-powered ones. In the interactive sessions, residents and small business owners identified locations that they felt would be ideal for charging locations. Recommendations included recreation centers, community centers, libraries, and private developments.

Through cross-departmental conversations, the City identified additional areas of opportunity. Some suggestions focused on areas with a high concentration of tourist and residential activity such as the Dayton Art Institute, Dayton Dragon’s stadium, and University of Dayton Arena. Other suggestions highlighted City-owned properties that might support EV chargers such as our recreation centers and popular public parks. All suggested locations are shown on the “Community Feedback” map and listed on the following page.
## COMMUNITY FEEDBACK LOCATIONS

<table>
<thead>
<tr>
<th>ID</th>
<th>Location</th>
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<tbody>
<tr>
<td>1</td>
<td>City of Dayton Community Golf Course</td>
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<td>10 Wilmington Place, Retirement Community</td>
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<td>2</td>
<td>Possum Creek MetroPark</td>
<td>30</td>
<td>Stivers School for the Arts</td>
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<td>3</td>
<td>Carillon Historical Park - Dayton History</td>
<td>31</td>
<td>Montgomery County Building</td>
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<td>4</td>
<td>Montgomery County Business Solutions Center</td>
<td>32</td>
<td>Downtown Dayton YMCA</td>
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<td>5</td>
<td>Brown Street business district</td>
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<td>6</td>
<td>Dayton Outpatient Center (DOC)</td>
<td>34</td>
<td>Wright Dunbar business district</td>
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<td>7</td>
<td>Dayton Metro Library - Southeast Branch</td>
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<td>8</td>
<td>Lohrey Recreation Center</td>
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<td>USPS (557 Salem Ave)</td>
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<td>9</td>
<td>Easttown Shopping Center</td>
<td>37</td>
<td>USPS (1111 E. 5th Street)</td>
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<td>10</td>
<td>Target Dayton Ministries</td>
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<td>Dayton Children’s</td>
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<td>Greater Dayton Regional Transit Authority Headquarters</td>
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<td>Kettering Field</td>
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<td>12</td>
<td>Dayton Beer Company</td>
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<td>The Salvation Army Dayton Kroc Center</td>
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<td>Water Street District</td>
<td>41</td>
<td>Kroger (3520 W. Siebenthaler Avenue)</td>
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<td>14</td>
<td>Tech Town</td>
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<td>Wegerzyn Gardens MetroPark</td>
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<td>2nd Street Market</td>
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<td>Gem City Market</td>
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<td>16</td>
<td>Dayton VA Medical Center</td>
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<td>Boonshoft Museum of Discovery</td>
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<td>17</td>
<td>Westown Shopping Center</td>
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<td>Northwest Plaza Shopping Center</td>
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<td>18</td>
<td>Dayton Metro Library - West Branch</td>
<td>46</td>
<td>Five Rivers Family Health Center</td>
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<td>19</td>
<td>Dayton Aviation Heritage National Historical Park (NAHA)</td>
<td>47</td>
<td>McIntosh Park</td>
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<td>20</td>
<td>Economy Linen &amp; Towel Services Inc</td>
<td>48</td>
<td>Montgomery County Job Center</td>
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<td>21</td>
<td>Five Rivers Health Centers</td>
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<td>Miami Valley Hospital</td>
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<td>22</td>
<td>Northwest Recreation Center</td>
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<td>City of Dayton Fueling Station</td>
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<tr>
<td>23</td>
<td>Greater Dayton Recreation Center</td>
<td>51</td>
<td>East Dayton Health Center</td>
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<td>24</td>
<td>Grandview Medical Center</td>
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<td>Dayton Metro Library - Burkhardt Branch</td>
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<td>25</td>
<td>Omega Senior Center</td>
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<td>Eastwood MetroPark</td>
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<td>26</td>
<td>Fifth Street Brew Pub</td>
<td>54</td>
<td>Airway Shopping Center</td>
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<td>27</td>
<td>Grace United Methodist Church</td>
<td>55</td>
<td>Dayton Raceway</td>
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<tr>
<td>28</td>
<td>Kroger (1555 Wayne Ave)</td>
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Other suggested locations not shown on the map include Dayton Public Schools (in particular high schools) and private schools. These locations will be considered for implementation even though not included on the preceeding map.
Based upon initial community feedback, the City identified a dozen locations for its first phase of EV chargers. Easy win locations were identified to facilitate quick installations and were selected by matching community supported locations with City-owned assets, areas of higher population density, and popular tourist destinations. During Phase I, the City will place an EV charging station in each of the five major land use areas (West, North Central, Northeast, Southeast, and Greater Downtown) as well as popular downtown, tourist, and workplace destinations.
City staff added a 5-minute walkshed to existing and planned EV chargers to illustrate the areas potentially served. This map demonstrates that the urban core and areas near the University of Dayton are relatively well-served. Other planned EV chargers will begin to serve residential populations further from the core, but the map illustrates the remaining gaps in our charging network.
To identify equitable and appropriate charging locations (both private and public), the City reviewed population density and concentrations of multi-family housing. The City utilized Census data to illustrate where our highest population concentrations are and mapped known multi-family housing buildings (SOURCE). The second phase of EV infrastructure should place chargers within easy walking distances of areas with high populations to ensure residents have equitable access to charging.
In developing an equity index for Dayton, staff considered factors in many categories, including accessibility, livability, economics, and education. U.S. Census and American Community Survey (ACS) 5-year estimates provide much of the data used in the index, but data was also drawn from the Ohio Department of Education, the Center for Disease Control (CDC), and the City’s own Departments of Public Works and Police. Using the equity index as a tool to identify vulnerable residents and geographic areas (those of highest disparity) allows staff to see more clearly how to equitably distribute amenities and provide more transparency when considering future land use changes.
This analysis utilizes two of the City of Dayton’s primary highway corridors, I-75 and US-35. Similar to the citing of gas stations, placing EV chargers near these corridors – particularly level three chargers that can provide a full charge in thirty (30) minutes – may prove to be an effective strategy for long-distance travelers.
The culmination of the previous analysis led to the proposed locations included in our Phase II rollout of EV chargers. The placement will be focused on areas of high population density to better serve residents living in multi-family buildings or without garage access. For residents who live in single-story homes, charging a vehicle at home will be the most cost effective. Residents who live in multi-family housing who do not have access for chargers will have the greatest barriers to charging.

**ID Priority Locations**
A  Stratford Place Apartments  
B  N. James H. McGee Blvd at Walton Ave  
C  Cornell Ridge Apartments  
D  N. Gettysburg Ave at Glenbrook Dr  
E  Desoto Bass  
F  Schuster Center  
G  Oregon District  
H  Grafton Hill  
I  W. Fairview Ave at Cherry Dr  
J  North Riverdale  
K  Wilmington Ave at Citation Ave  
L  Woodman Park Apartments  
M  Highland Park  
N  Brandt Pike at Avondale Dr  
O  Troy St at Leo St  
P  Forest Ridge/Quail Hollow  
Q  Northwest Plaza
RECOMMENDATIONS

By 2030, 50% of all cars sold will be electric vehicles. To ensure City of Dayton residents have equitable access to charging infrastructure, public and private partners will need to work together. The City is committed to providing EV charging stations on all appropriate public property, but City parks and rec centers alone will not solve the EV infrastructure gap. This report provides geographic guidelines for where charging infrastructure is needed and may be best utilized – particularly on private property. Where possible, the City will complement private infrastructure by identifying locations for charging facilities along public streets and in the public right-of-way.

In addition to location recommendations, the City identified a series of policy and program opportunities to support equitable charging, to encourage private installations, and to ensure access to charging will not be a barrier to electric vehicle ownership.

Below are a few recommendations for how the City can directly and indirectly improve EV charging availability.

**Leverage public rights-of-way to provide access to EV charging, particularly in disadvantaged communities.**
When evaluating owned assets, the City identified rights-of-way as ideal places for EVSE, however, the installation cost at these locations poses a significant challenge. While the City does own many assets such as parks, community centers, and maintenance buildings, these assets do not always align with the areas of highest charging need. Therefore, while rights-of-way are one of the most abundant and closest assets the City can utilize for the placement of chargers, identifying appropriate funding is a necessary component of this effort.

**Explore methods for notification or coordination of private EV chargers to ensure equitable distribution.**
As charging demand rises, more private developments are installing chargers. While private charging stations are an important component of a comprehensive charging program, there is an opportunity to share resources to prevent too much redundancy in certain locations.

Creating a communication loop that invites private landowners to collaborate, coordinate, and inform the City about potential EV infrastructure investments may help prevent overconcentration and preserve resources for areas of greater need.

**Work with AES Ohio to coordinate EV charger installations across the city and with local advocacy groups (including Drive Electric Dayton) to determine appropriate charger locations.**
There are important regional partners with whom the City of Dayton should coordinate as we work together to increase the number of EVSEs across the city. One of the largest partners in the region for the installation of EV chargers is AES Ohio. AES Ohio provides EV charging rebates to public and private partners, as well as coordinating with installing infrastructure so jurisdictions can meet their charging needs. As one of the most active charging partners in the region, the City will continue to coordinate with AES Ohio to ensure a smooth rollout of new chargers and to avoid any unnecessary stress on the energy grid. The City also recognizes the value and expertise of local advocacy groups, like Drive Electric Dayton, and will coordinate with them to guide policy and placement for EVSE throughout the city.
Advocate and support the deployment of chargers at workplaces and locations where members of disadvantaged communities are employed.
Workplace charging was identified as one of the largest charging needs during our community engagement sessions. While many workplaces have started to install chargers, some, especially those in disadvantaged neighborhoods, might not have the capacity or capital to install chargers. Therefore, the City will work closely with employers to deploy chargers onsite within the City of Dayton to ensure that residents and businesses have access to chargers both at home and at work.

Support and encourage installation of appropriate chargers in high-density, low-income areas.
If the City leaves the siting of EVSE solely to private charging operators and developers, charging facilities may continue to be installed in isolated commercial developments and affluent communities (American Planning Association, 2022, p. 10). To ensure access for our underserved populations, the City will need to continue this planning process and adopt supportive equity-focused policies. Approaches to advancing equity in EVSE implementation may include regulatory changes to ensure access to EVSE, prioritizing City-led installations within underserved neighborhoods, and working with employers and supportive housing developments to identify creative solutions.

Explore ways to make EV charging affordable for disadvantaged communities.
The barriers to affording a private EV vehicle – and associated charging costs – will not be addressed simply by making EV chargers more accessible. The City recognizes the need for private EV charging providers to charge for usage. However, high charging costs can be a barrier for residents. Therefore, the City will investigate ways to create and support programs that ensure EV charging is affordable for all residents. This may include a voucher program for discounted rates on City-owned chargers and/or placing free charging in certain neighborhoods or businesses districts.

Adopt policies and legislation for EV uptake and charging infrastructure.
The companion to infrastructure is programs and policies that encourage new charging stations and support equitable use. Policies might include grants or forgivable loans to businesses and workplaces to install EV chargers, requiring EV wiring be installed in new construction & remodeling projects, incentivizing charging companies to place chargers in areas of greater need, and adopting revisions to City regulations to better support EVSE and related services.

NEXT STEPS
As the world moves to adopt electric vehicles, it is the responsibility of local jurisdictions to create programs, policies, and incentives to help our community make the conversion to electric, install EVSE, and ensure equitable access. While this is no small task, this report is a first step in making data-based decisions on our city’s EV future.

Over the next several months, the City will work to adopt a more comprehensive policy and strategy for the rollout of electric vehicle chargers for our community. As part of this strategy, the City will:

1. Set charging installation goals,
2. Use this study to start implementing chargers in the areas with greatest need, with a particular focus on dense residential districts with a high concentration of apartment buildings, and
3. Create charging incentives with our partners in the region.

Lastly and most importantly, the City will work to ensure resident and business voices are at the forefront of decision-making for the placement of this infrastructure. The City of Dayton pledges to be an electric vehicle friendly city, making it easy and cost effective to charge within city limits. While this report is just the beginning, our hope is that we will be one of the most EV ready cities in the US within the next decade.
REFERENCES

