WEST HARTFORD

ELECTRIC VEHICLE (EV) INFRASTRUCTURE PLAN

March 2024

Stantec

Source: Adobe

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The following goals were established in support of this vision:

- Identify where and how community charging can be **implemented cost-effectively** in response to market demand.
- **Prioritize equity,** especially for people without designated EV charger access, and recommend enabling policy to close accessibility gaps
- Leverage EV adoption as a strategy to **reduce emissions** and improve air quality.
- Determine a **business model**, pricing strategy, and monetization opportunities to offer charging to EV owners at the lowest possible cost.
- Identify the **governance structure** to develop and maintain enabling policy and manage contracting with third-party charging providers.
- Identify and leverage **synergies with existing plans** and town priorities.
- Consider long-term maintenance and **performance management** as a foundational component of the plan.

With significant new investments being made in electric vehicles (EVs), now is the time for West Hartford to plan its role in this ecosystem. This project builds upon West Hartford's history of embracing sustainability and innovation by establishing a roadmap for the infrastructure investments and enabling policy required to meet the widespread EV adoption expected in the region.

The vision for this project is to develop a community charging plan for West Hartford residents, workers, and visitors. The focus on community charging means that the Town will prioritize infrastructure for day-to-day use by the people spending time in West Hartford while relying on federal, state, and private investment to support long-distance travel needs..

To develop this plan, the Town utilized an iterative, collaborative, and multifaceted process which included a combination of public and stakeholder engagement, internal workshops, technical studies, and policy analyses. Key findings from these activities include:

Demand is growing for EV charging infrastructure—

Based on the estimated adoption growth rates in West Hartford, by 2035 there could be over 30,000 registered EVs throughout the Town. This level of adoption will require more than 500 new publicly available chargers to meet recommendations by the National Renewable Energy Lab.

The Town can encourage EV adoption by addressing concerns about charging- People in West Hartford are interested in buying EVs but have concerns about the cost and ease of charging to support the driving range they need. While the purchase cost of EVs is coming down with time, the Town can help reduce range anxiety by making charging readily available and accessible.

Good locations for EV charging exist in West Hartford, largely on town-owned land or in business districts—Based on technical analysis, survey results, and upcoming capital improvement projects, the top priorities for new EV infrastructure include (shown on map on next page):

- Town-owned parking in Blue Back Square/West Hartford Center including the Arapahoe and Town Hall parking lots and on-street parking along Isham Road.
- Business districts including Park Road (on-street parking near the Playhouse on Park identified as a top priority) Bishops Corner Elmwood/Home Design District and the New Britain Avenue corridor.
- Town-owned schools and parks, with Walcott Park identified as a top priority.

The West Hartford power grid can support EV charging—While there is generally sufficient grid capacity to support charging at the locations identified above based on data collection from EverSource, other physical alterations (such as increased clearance space in parking lots, bollards to protect equipment, and upgrades to each site's electrical panel) will be required to meet industry safety and accessibility standards.

State, Federal, and private funding is available, especially with a strategic funding/grant strategy— Funding is available for these investments from multiple sources, meaning many of the recommendations in this document can be achieved without significant costs to the Town. However, these funding sources are competitive and will require a cohesive strategy to be successful.

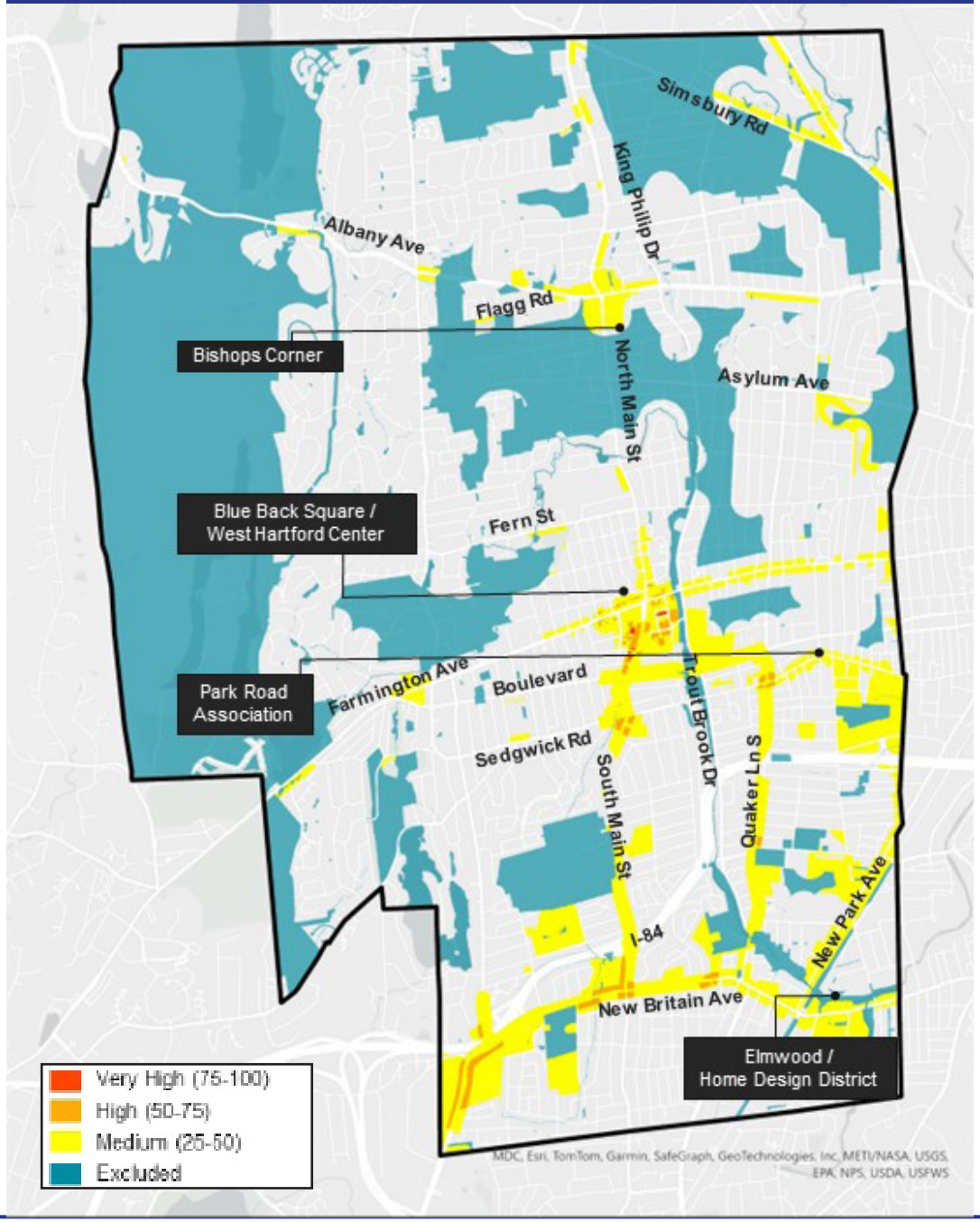
The recommended business model will split ownership and operations responsibilities between the Town and a third-party vendor— Implementing EVSE on Town-owned property will require a thoughtful contracting approach in which the Town retains ownership of infrastructure and has the ability to set pricing, but works with a third-party vendor to perform maintenance and operations duties.

Additional local policy change is necessary to best support EV adoption— For EVSE to become widespread, the Town will need new policy and regulatory tools to encourage adoption on private property. Potential strategies include changes to zoning and building codes to establish minimum standards for chargers.

This document includes the following sections:

1. Introduction describing the context, vision and goals, and overall planning process for this project.
2. Existing conditions including adoption trends, demand and suitability analysis results, and lessons learned from community engagement.
3. The governance, policy, and contracting considerations to deliver recommended EV infrastructure on Town-owned property while enabling adoption more widely.
4. Site requirements for different types of parking typologies.
5. Recommendations and next steps to deliver this program.

Figure 1. Demand and Suitability Analysis Results



1. INTRODUCTION

1.1 Project Context

The transportation industry is undergoing a seismic shift as automakers and consumers shift from traditional internal combustion engines (ICE) to electric vehicles (EVs). Many states throughout the Northeast have adopted the Advanced Clean Cars II rule established by the California Air Resources Board (CARB). This mandate establishes a year-by-year roadmap to 2035, when 100% of new cars and light trucks sold in CARB states must be zero-emission vehicles[1]. While Connecticut is no longer one of the states adhering to this policy, recent trends suggest that widespread EV adoption in Connecticut is no longer a question of if, but how soon.

- In support of this transition, the federal government has advanced a number of new funding streams, programs, and policies through the Infrastructure Investment and Jobs Act (IIJA, also sometimes known as the Bipartisan Infrastructure Law) enacted in 2021 and the subsequent Inflation Reduction Act enacted in 2022. Among the $30 billion in funding for EV incentives and charging infrastructure, the following will likely have the biggest impact on state and local governments:
- The National Electric Vehicle Infrastructure (NEVI) program, which will distribute $5.0 billion in formula funding to state governments to build out direct current fast charging (DCFC) infrastructure for long-distance travel. The Connecticut Department of Transportation (CTDOT) will receive $52.5 million of this funding and will allocate this according to the Connecticut NEVI Plan.
- The $2.5 billion Charging and Fueling Infrastructure (CFI) program, which will award discretionary grants to government agencies to build out both community charging infrastructure (generally, a slower charging speed for places where people live, work, and shop) and address additional corridor charging needs not covered by NEVI funding.
- Tax incentives for people who purchase EVs, including a new tax credit for used vehicles for people with low to moderate incomes. With these tax incentives now offered directly as rebates from car dealerships, many people will find that EVs cost about the same price as a similar ICE model.
- Nearly $16 billion in funding for the purchase of low and zero emission transit and school buses, including the supporting upgrades to agency facilities to charge and refuel them.
- Battery lifecycle programs totaling over $6 billion aimed at improving the sustainability of material mining, processing, manufacturing, and recycling.

In addition to these federal programs, many states, electric utilities, and philanthropic organizations are making significant investments in communities as they begin their transportation energy transition. Recognizing the opportunities and challenges that this rapid transition will create, the Town of West Hartford engaged Stantec to develop an EV Infrastructure Plan to prepare for the future. This document summarizes the outcomes of public engagement, technical analysis, and workshops with Town stakeholders on the following topics:

- Existing conditions including current and projected EV adoption, charging station site suitability considerations, and the results of mapping analysis to identify the best possible sites for EV infrastructure.
- Governance, policy, and contracting considerations to drive the organizational change within the Town required to finance, build, operate, and maintain EV infrastructure.
- Design guidance for charging infrastructure that builds upon the Town's existing standards while respecting the unique contexts of the West Hartford built environment.
- Final recommendations that synthesize the information above and establish a time-phased approach to building out charging infrastructure while leveraging outside funding sources.

Finally, alignment with existing Town priorities and planning efforts was an important component of this project.

- The 2030 West Hartford Plan of Conservation and Development, which recommends a zoning ordinance review to address electric vehicles and prioritizes sustainable energy investments at Town facilities.
- Participation in the Sustainable CT program, in which West Hartford currently holds a Silver certification. Completion of this plan aligns with ongoing activities by the Town and the Sustainable West Hartford Commission to achieve Gold certification in 2024.
- The ongoing West Hartford Center Infrastructure Master Plan, which is evaluating transportation, facility, and infrastructure improvements such as EV charging.

1 The CARB mandate defines both EVs and plug-in hybrid electric vehicles (PHEVs) as zero emissions vehicles. Because this project is focused on charging infrastructure that can be utilized by both types of vehicles, this document will use the term EV to describe both.

- The Town's adopted 2020 Energy Plan, which was incorporated by reference into the POCD.
- The Town's Resolution Declaring a Climate Crisis, which calls for the Town to "assess the climate change impacts of all future Town actions…and encourages residents to do the same."
- The Town of West Hartford is currently designing a new Elmwood Community Center at 100 Mayflower Street that will be constructed using sustainable resources and will be net zero or net zero ready. The Town is exploring installing EV charging stations in support of this goal.

1.2 Vision and Goals

The vision for this project is to develop a community charging plan for West Hartford residents, workers, and visitors. The focus on community charging means that the Town will prioritize infrastructure for day-to-day use by the people spending time in West Hartford while relying on federal, state, and private investment to support long-distance travel needs. The following goals were established in support of this vision:

- Identify where and how community charging can be implemented cost-effectively in response to market demand.
- Prioritize equity, especially for people without designated EV charger access, and recommend enabling policy to close accessibility gaps.
- Leverage EV adoption as a strategy in reducing emissions and improving air quality.
- Determine a business model, pricing strategy, and monetization opportunities to offer charging to EV owners at the lowest possible cost.
- Identify the governance structure to develop and maintain enabling policy and manage contracting with third-party charging providers.
- Identify and leverage synergies with existing plans and town priorities.
- Consider long-term maintenance and performance management as a foundational component of the plan.

1.3 Planning Process

The Town utilized an iterative, multifaceted planning process in developing this plan which included a combination of public and stakeholder engagement, internal workshops, technical studies, and policy analyses. The image below illustrates how these components were integrated to develop realistic and meaningful recommendations to build the physical and policy infrastructure required for EV adoption.

Public engagement included a Department of Public Works open house and a survey with nearly 500 responses. The survey included questions about peoples' priorities and concerns for the EV plan and included a Social Pinpoint mapping exercise to show where people wanted to see charging infrastructure. A summary of the survey results is included in this document.

PLANNING PROCESS

Project Vision
- Public priorities and concerns
- Town leadership goals
- Stakeholder roles
- Relevant planning efforts

Charging Needs
- Current and future local EV adoption
- Land use and density
- Transportation network

Site Suitability
- Utility hosting capacity
- Site layout
- Lighting, accessibility, and safety
- Town-owned vs. privately-owned property

Enabling and Funding
- Department roles and responsibilities
- Zoning and building code
- Contracting
- Funding opportunities

2. EXISTING CONDITIONS

2.1 State Level EV Trends

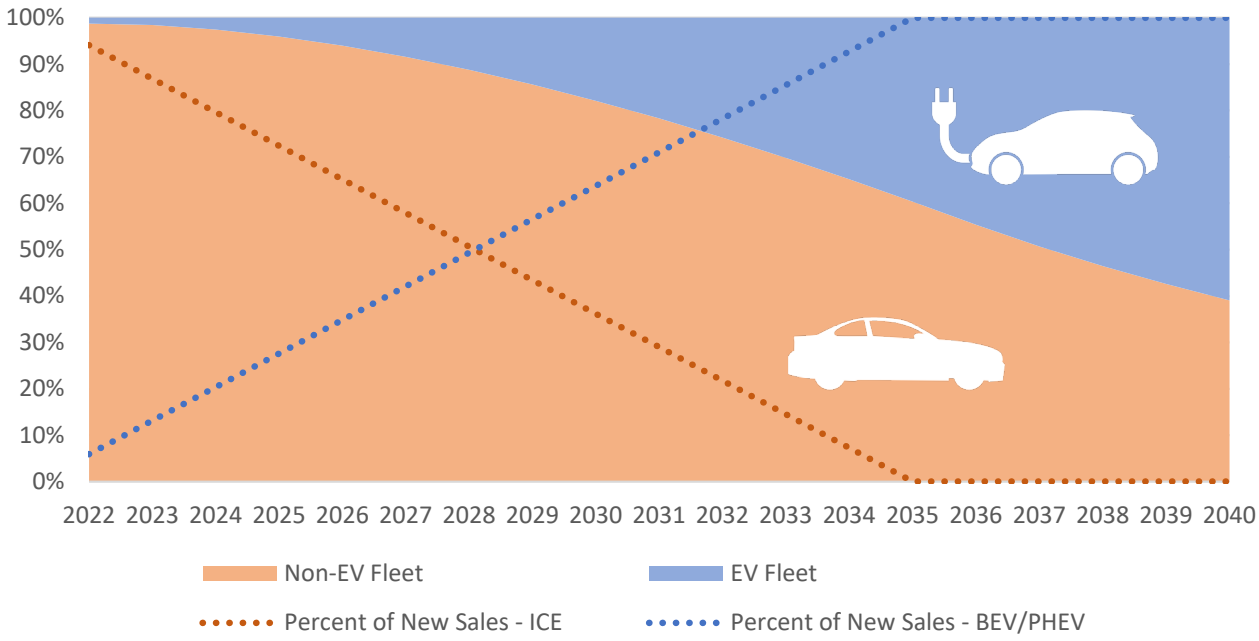
EVs represent a major shift in the transportation sector. While EVs are growing in popularity and are becoming more common on the roads, the transition to all electric or zero-emission vehicles is still in its infancy.

In 2022, there were 31,192 zero emission vehicles (ZEVs) registered in Connecticut (CT) according to EValuateCT[2]. This represents a little more than **1% of the total registered light duty vehicles in the state**. However, ZEVs make up a larger proportion of the new vehicle registrations in the state. Approximately **6% of new vehicles registered in 2022 were ZEVs,** outpacing national trends.

While Connecticut is no longer following the CARB Clean Cars II mandate, it is expected that the CARB mandate will impact production decisions of major auto manufacturers and model availability in the Northeast. As such, the target of widespread adoption of ZEVs outlined in the CARB mandate was used to provide a high-end estimate of ZEV deployment (and the required number of chargers) in West Hartford. These projections assume that all new light duty vehicles will be ZEVs by 2035. Even with this rapid deployment of new EVs, it is worth remembering that the overall makeup of vehicles on the road will change less rapidly since most vehicles remain on the road for over a decade.

Figure 2 shows a simple EV fleet penetration model based on West Hartford's assumed EV adoption trajectory. In this model, a linear increase in EV new car sales is assumed to reach 100% in 2035 and a steady retirement rate of 8% of the existing fleet is assumed each year. In addition to showing the expected proportion of new car sales, the figure shows expected makeup of EVs and non-EVs on the road over time. Based on this projection, in 2035 EVs will make up approximately 40% of the vehicles on the road even though all new light-duty vehicles will be EVs (or another form of zero emissions vehicle such as hydrogen). At the state-level, there are currently approximately 2.5 million registered light-duty vehicles. Assuming the total number of light-duty vehicles remains consistent, it is expected that by 2035, there will be about **one million EVs registered in the state.**

Figure 2. EV Fleet Penetration Model



Source: EvaluateCT, 2023

[2] EvaluateCT (accessed March 22, 2023) based on Connecticut Department of Motor Vehicle 2022 data. ZEVs are generally defined as vehicles with the capacity to operate without tailpipe emissions. ZEVs can include battery electric vehicles (EVs), hydrogen fuel cell vehicles, and plug-in hybrid electric vehicles (PHEVs). PHEVs have both an internal combustion engine and an electric propulsion system, but with an on-board battery that can be charged independently of the internal combustion engine.

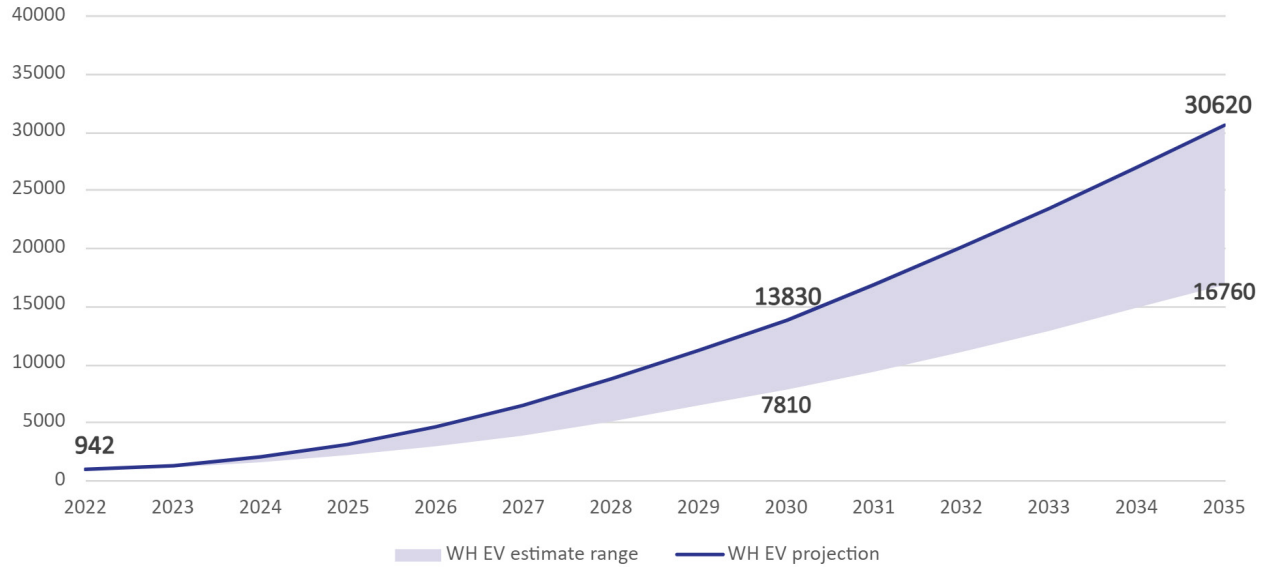
2.2 West Hartford EV Ownership Trends

Currently, there are approximately 41,000 light-duty vehicles registered in West Hartford, representing 1.6% of the total light-duty vehicle registrations[3]. Of those, 942 are EVs or PHEVs. Approximately 3% of West Hartford vehicles are classified as ZEVs, which is more than double the statewide average.

A simple projection of ZEV registrations in West Hartford was developed based on the statewide deployment model presented above. In the figure below, the high-end EV projection assumes that **West Hartford will continue to account for 3% of the state's overall EV registration.** The low-end estimate assumes that West Hartford will revert towards the state average based on the proportion of vehicle registrations in the town. Based on this approach, it's estimated that between 16,700 and 35,200 EVs could be registered in the Town by 2035.

This estimate projects more than 32 times the number of EVs on the road in West Hartford by 2035. By 2030, the projection suggests 19-34% of the vehicles registered in West Hartford will be EVs, and by 2035 that range increases to between 41-75%.

Figure 3. Projected EV Adoption in West Hartford



Source: EvaluateCT, 2023

ZEVs are expected to increasingly dominate sales in the light-duty vehicle segment over the coming decade. This represents a major transition in the automotive sector. When these projections are translated to the local level, it's expected to result in significant changes to the vehicles on the road that will require a reimaging of transportation fueling infrastructure.

[3] EvaluateCT (accessed March 22, 2023) based on Connecticut Department of Motor Vehicle 2022 data.

2.3 Associated Charging Infrastructure

As EV adoption increases in West Hartford, there will be increasing demand for charging infrastructure. There are three broad categories for EV charging infrastructure:

- **Residential charging** is expected to be the most commonly used charging infrastructure, for most EV owners. It can be expected that many EV owners will charge their vehicle at home, likely overnight while the vehicle is parked in their driveway or garage.

- **Workplace charging** is another important need for EV charging. This refers to charging infrastructure that is privately owned and dedicated for employees. Workplace charging helps support EV drivers who commute longer distances to work or lack charging options at home.

- **Public charging** includes a wide range of potential settings that are open to all EV drivers, though some may have use restrictions. For example, businesses that have EV charging in their parking facility would be considered "public" even if it is only available to customers. Public charging includes both publicly and privately owned chargers.

Because this project focuses primarily on publicly available charging, the project team used the fleet penetration projections in Figure 2 to determine the charger footprint required to serve future adoption.

How many public chargers are needed to support the projected EV ownership in West Hartford?

The National Renewable Energy Laboratory (NREL), National Plug-In Electric Vehicle Infrastructure Analysis, includes estimates for the number of public EVSE required to serve both day-to-day travel and long distance trips. The model considers a wide range of potential scenarios and factors, including the concentration of EVs on the road and travel patterns. From this modeling, NREL has developed the following recommendations for Level 2 and Direct Current Fast Chargers (DCFC):

- **Level 2 chargers**, typically installed in residential, workplace, and retail environments to provide a full charge over 4-12 hours.

- **Direct current fast chargers (DCFC)** operate similarly to a gas station and charge a vehicle in about 30-60 minutes. DCFCs are essential for long-distance travellers, people without chargers at home, and people who do not have time to wait for a full charge with a Level 2 charger.

Table 1 summarizes the recommended number of plugs for towns, and nationally per 1,000 EVs on the road. Note: Some charging equipment will have multiple plugs.

Table 1. Recommended Plugs per 1,000 EVs

	Number of public level-2 charger plugs per 1,000 EVs	Number of public DCFC charger plugs per 1,000 EVs
Nationally	16	1.7
Towns	23.3	2.2

Table 2 applies the national recommended number of EV charger plugs based on the projected EV registrations in West Hartford.

Table 2. Recommended Plugs in West Hartford

	2030	2035
Projected EV registrations in West Hartford	13,380	30,620
Recommended number of Level-2 plugs	222	491
Recommended number of DCFC plugs	23	51

Based on these estimates, ***a significant number of EV chargers will be necessary to support long-term EV adoption in West Hartford***. The Town of West Hartford can certainly help support the deployment of public EV charging infrastructure in the community; however, an infrastructure buildout of this size will require participation by community stakeholders and businesses. Further exploration of deployment strategies for public EV chargers is presented in Section 3 Governance, Policy, and Contracting Considerations.

2.4 Site Suitability

A number of factors go into site selection for EV charging: compatibility with current and future land uses; grid capacity and availability of supporting utility infrastructure; transportation factors such as roadway classification, traffic, parking, and designated alternative fuel corridors; and protection of sensitive land uses such as floodplains, wetlands, and cultural/historic resources. The project team conducted geographic information systems (GIS) analysis to integrate these considerations and recommend ideal sites for charging infrastructure.

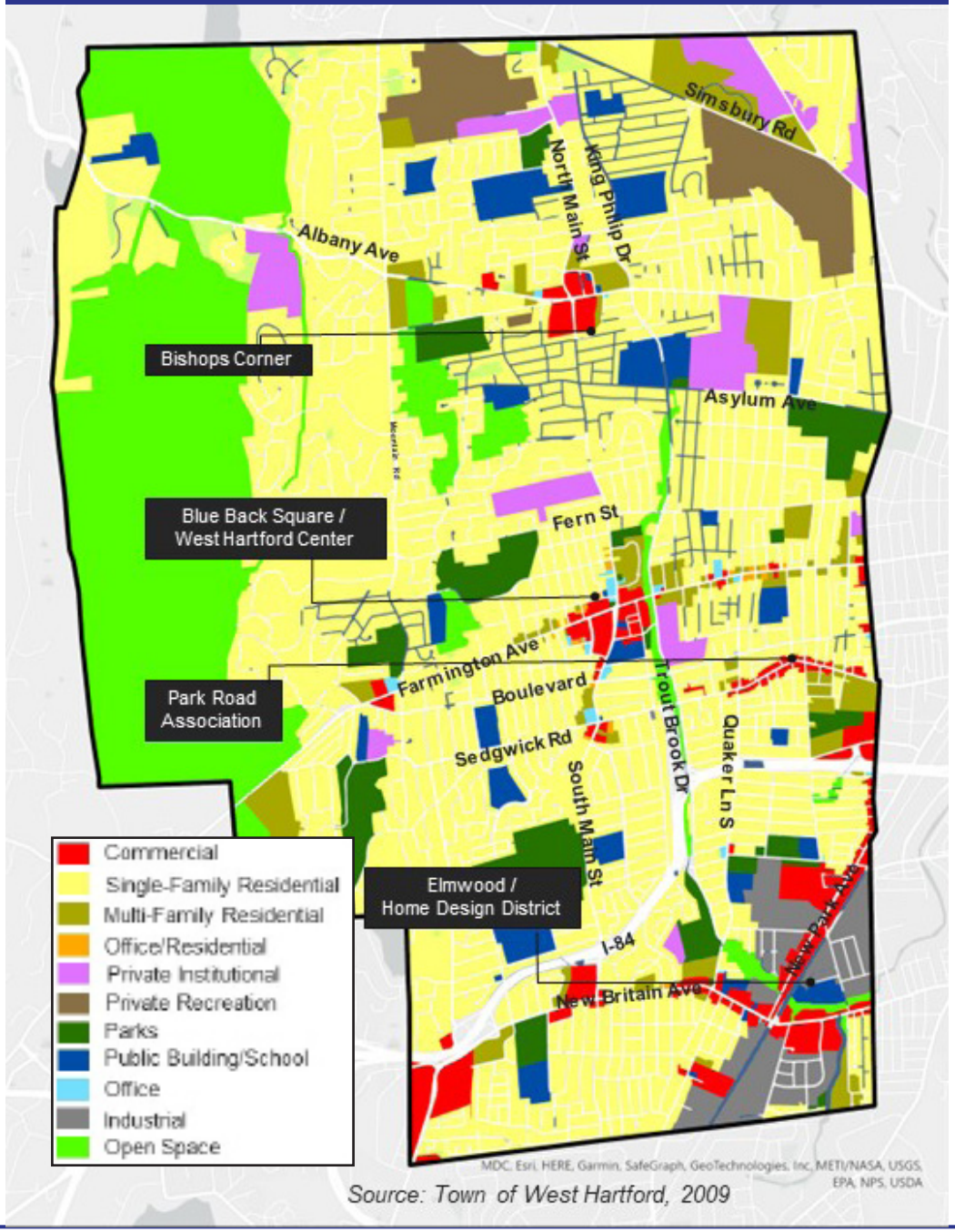
2.4.1 LAND USE

The suitability analysis includes future land uses to ensure alignment with other Town planning processes. The most recent land use plan from 2009 is shown in Figure 4. Future Land Uses in West Hartford. Based on discussions with the Town, this analysis incorporates the land use types listed below:

- Residential
- Commercial/ Service
- Office
- Industrial
- Parks
- Institutional Private
- Public Building (not including schools)
- Schools

These land uses are suitable for EV charging infrastructure as they are either publicly accessible and/or locations where people may park for a relatively long period of time. Note: the project team utilized a Town land use GIS layer which may reflect land use changes since the 2009 plan.

Figure 4. Future Land Uses in West Hartford

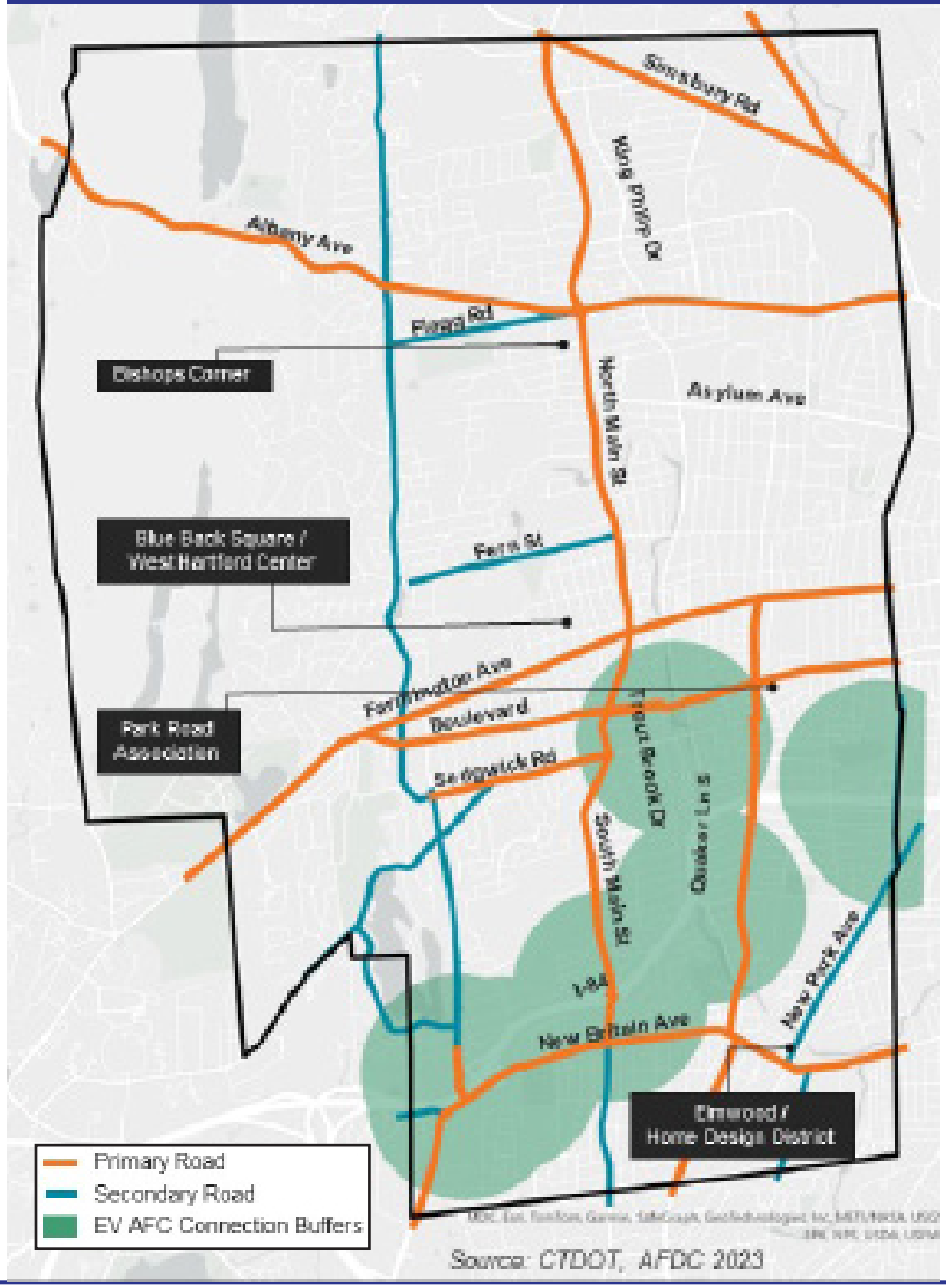


Source: Town of West Hartford, 2009

2.4.2 Transportation

Roadway classifications were used as an approximation for traffic, with primary and secondary roadways prioritized to identify infrastructure and adjacent land uses with high activity. Additionally, West Hartford interchanges with designated Alternative Fuel Corridors were included to prioritize areas supporting direct access to this network (which increases the availability of federal and state funding opportunities). The resulting map is shown in Figure 5. Roadway Suitability Analysis.

Figure 5. Roadway Suitability Analysis



Blue Back Square entrance on Memorial Road.

2.4.3 Power Capacity

Figure 6. Hosting Capacity shows the megawatt (MW) power capacity available on the Eversource electrical distribution system. Power capacity is included in the suitability model to identify areas with sufficient electrical capacity to serve EV charging. Figure 7. Areas with Low or No Power Capacity shows locations capacities below 0.25 MW, which were determined to be unsuitable in the GIS-based analysis. Installing EV charging infrastructure in these locations could require significant investment in enabling utility infrastructure or site charging capacities may need to be limited. The areas determined to be unsuitable due to limited power capacity are highlighted in purple. The West Hartford EV infrastructure strategy focuses on Level 2 community charging; DCFC equipment will require significantly higher power levels and would result in a map with far fewer available sites.

Figure 6. Hosting Capacity

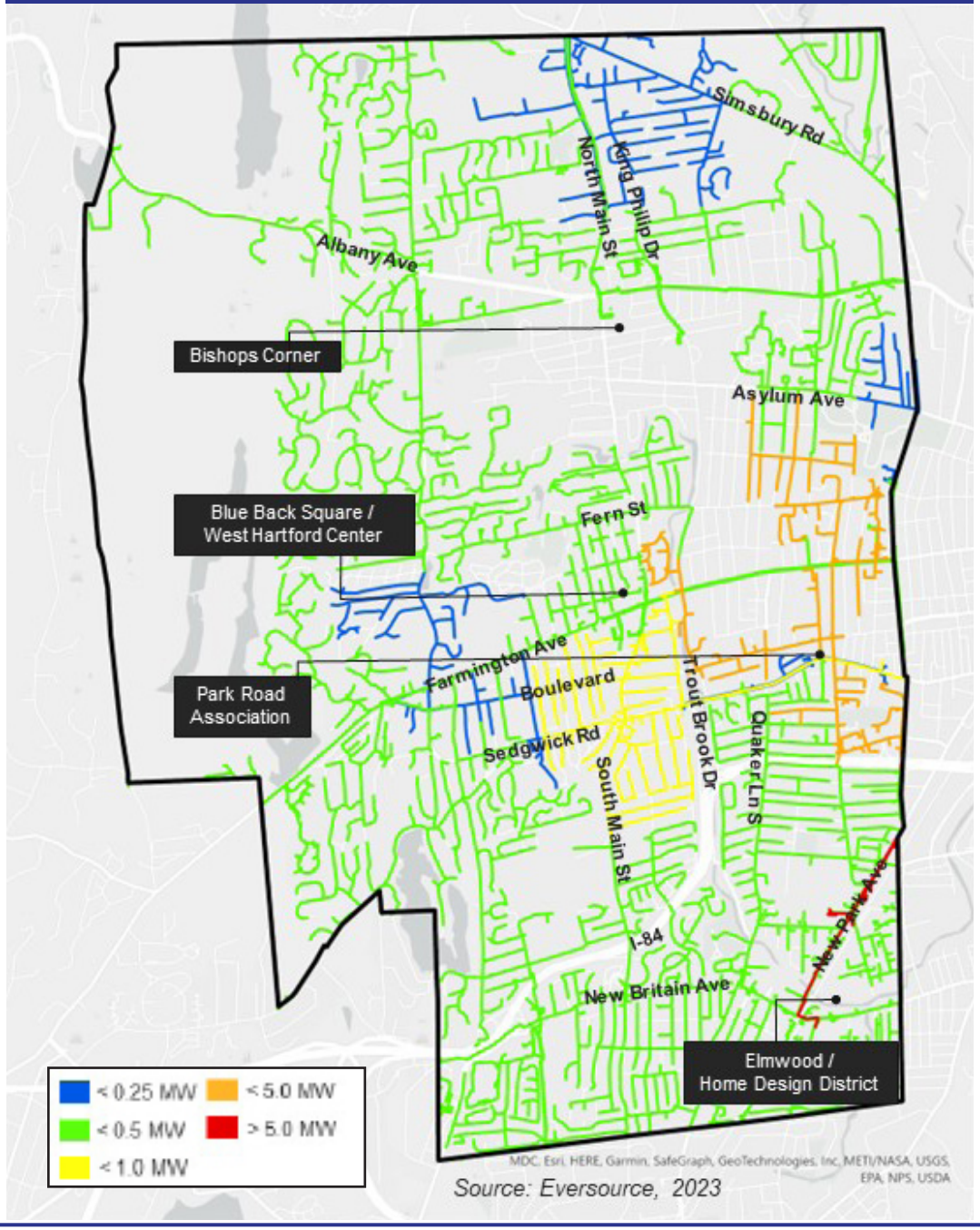
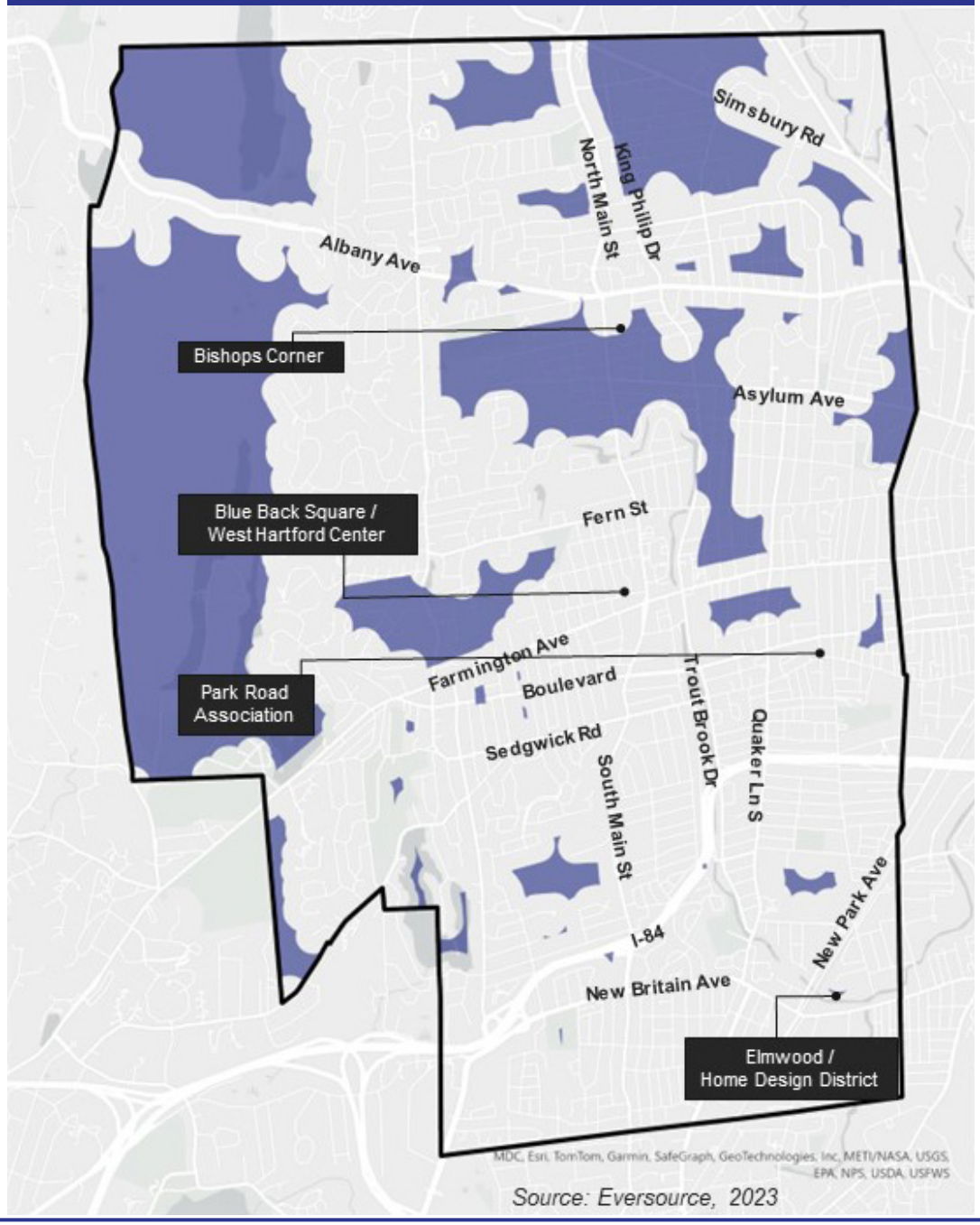


Figure 7. Areas with Low or No Power Capacity



Source: Eversource, 2023

2.4.4 Community Outreach

This plan is intended to support West Hartford residents, workers, and visitors in the transition towards EV adoption. Outreach to understand current and future desires of the community was a key component of the project. The Town sought input through both public surveys (one open to all participants and one targeted towards local businesses) and in-person engagement at the Celebrate West Hartford and Department of Public Works open house events. During these events, attendees were asked where they'd like to see EV charging stations in West Hartford, what their top priorities were in developing a charging network, and their primary concerns related to purchasing an EV.

The online public survey was open from June 5-30, 2023. Participation was solicited through various means, including postcards, advertising at local libraries, social media posts, and on the Town's website. In total **462 participants** responded to the survey, and a wide range of perspectives were shared.

Priority EV Charger Locations from West Hartford Department of Public Works Open House

Based on the responses received, most of the participants (62%) currently own traditional gasoline- or diesel-powered vehicles; however, almost a quarter of the participants (24%) were currently owners of ZEVs (i.e., plug-in-hybrid or electric vehicles). Given that only 3% of vehicles registered in West Hartford are currently ZEV, this suggests that ZEV owners were particularly interested in the community engagement process. Although this sample is not representative of all West Hartford vehicle owners, ZEV owners are likely to offer valuable insights on charging needs for the community since they have direct experience with these technologies. Figure 8 shows the vehicle ownership data shared by the survey participants.

In addition to asking about current vehicle ownership, participants were also asked about future interest in purchasing ZEVs. While there were varying levels of interest in ZEVs, most participants (69%) already owned or leased a ZEV or had given some consideration to a ZEV for their next vehicle. There was also a sizable portion of participants (19%) who were not interested in a ZEV at this time.

Figure 8. Vehicle Ownership of Survey Participants

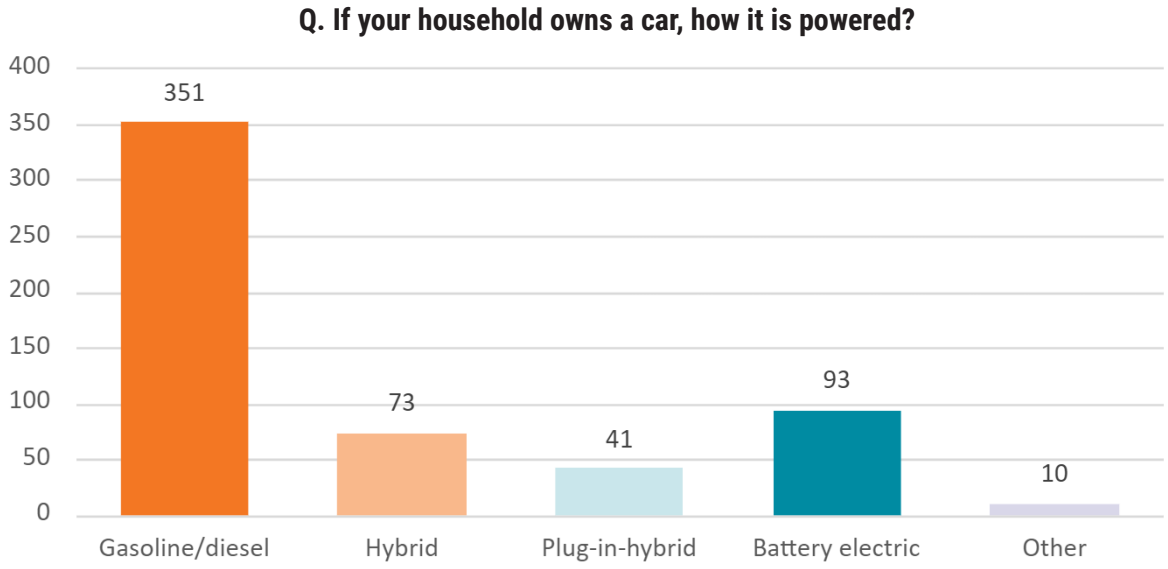
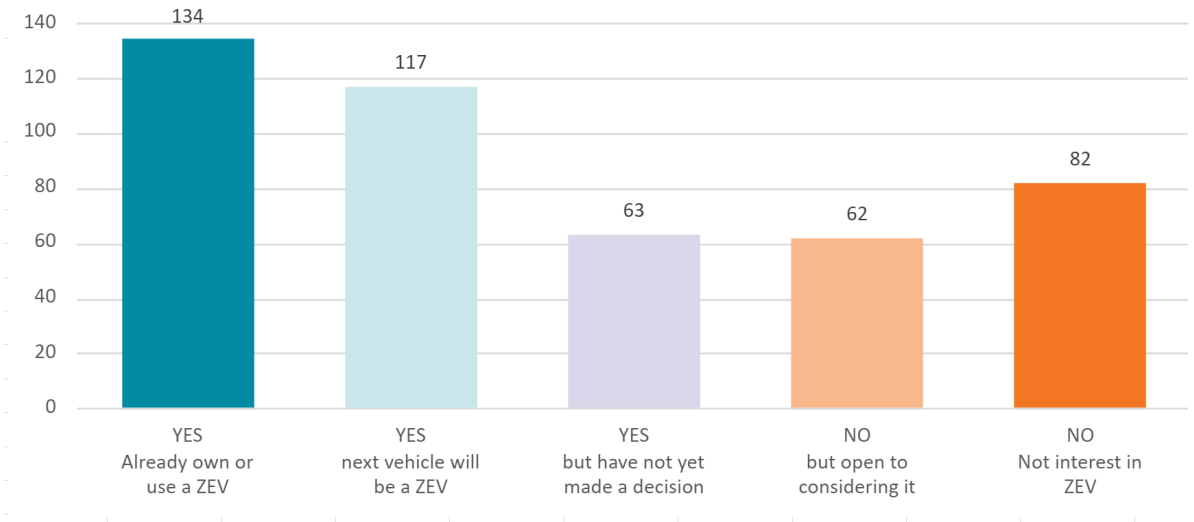


Figure 9. Survey Participant Interest in EV Ownership



Source: Public Survey, 2023

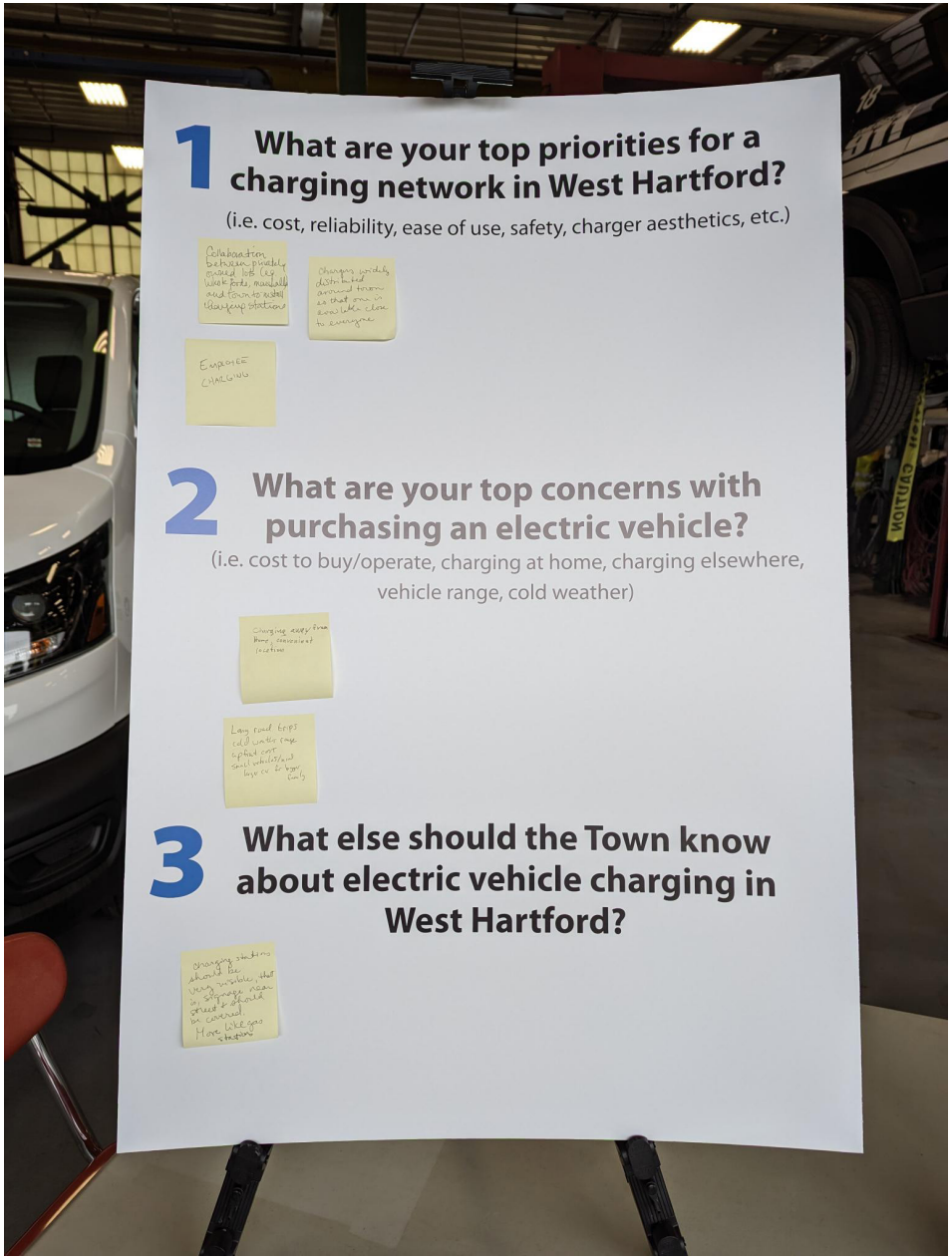
For the participants who do not currently own a ZEV, the **most common concern or barrier to ZEV ownership were**:

1. Purchase cost compared to traditional gasoline/diesel vehicles.
2. Concerns about vehicle range.
3. Operating costs, such as maintenance and electricity, compared to traditional gasoline/diesel vehicles.

Across participants, the **top three priorities for building a charging network for West Hartford** were:

1. Widespread availability throughout the Town.
2. Reliable equipment.
3. Low or no cost to users to charge their vehicles.

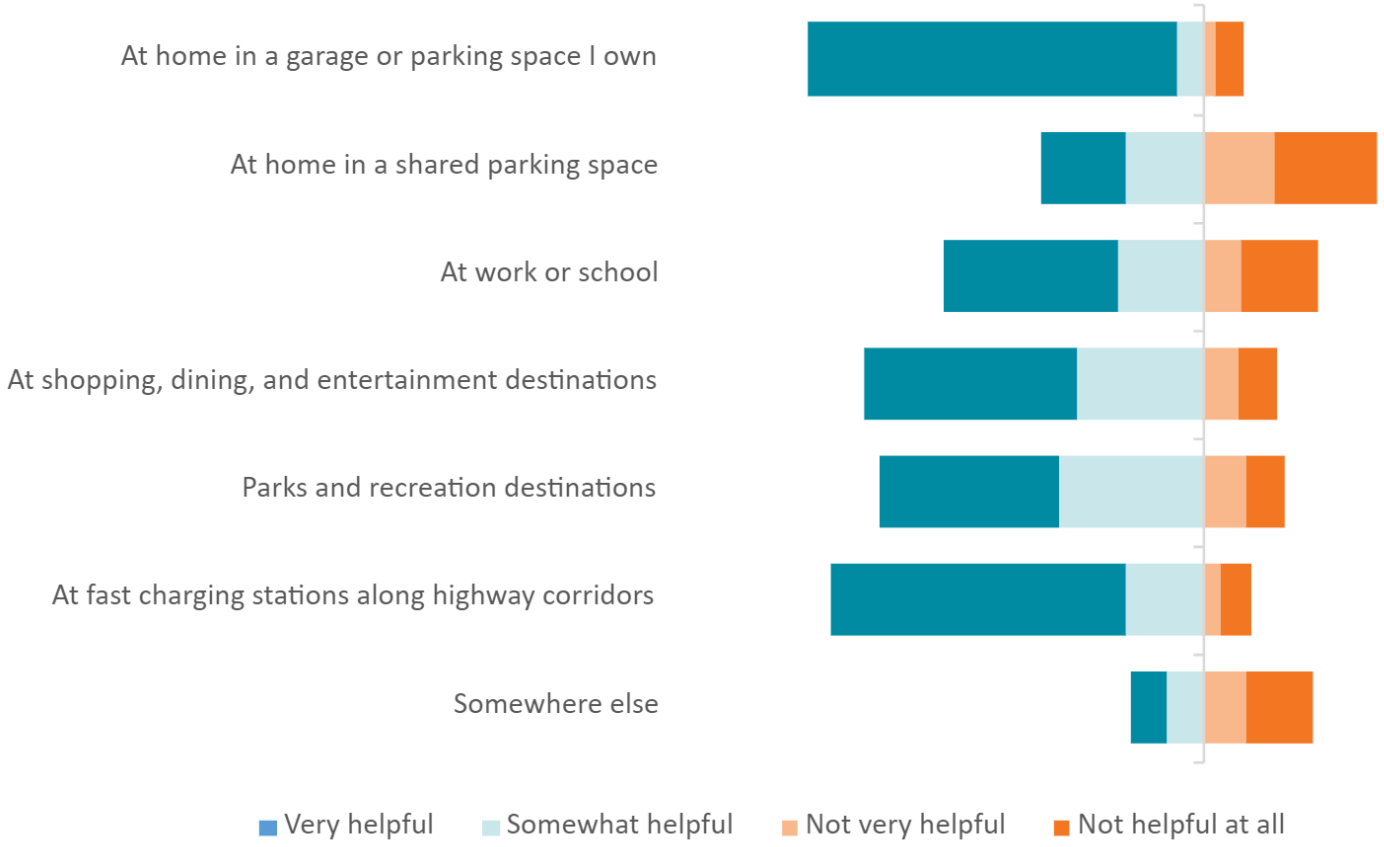
Figure 10 shows responses to the question "Where would EV charging stations be most helpful?" Home charging and fast charging stations along highway corridors were most widely identified as helpful. Shopping, dining, and entertainment destinations; parks and recreation destinations were the next two locations identified as being most helpful. The majority of respondents who provided feedback that none of these locations would be helpful stated that they did not intend to purchase and ZEV or that they favored private sector deployment of charging stations.



Questionnaire results from Department of Public Works Open House

Figure 10. Survey Participant Preferences for EV Charging Station Locations

Q. Where would EV charging stations be most helpful?

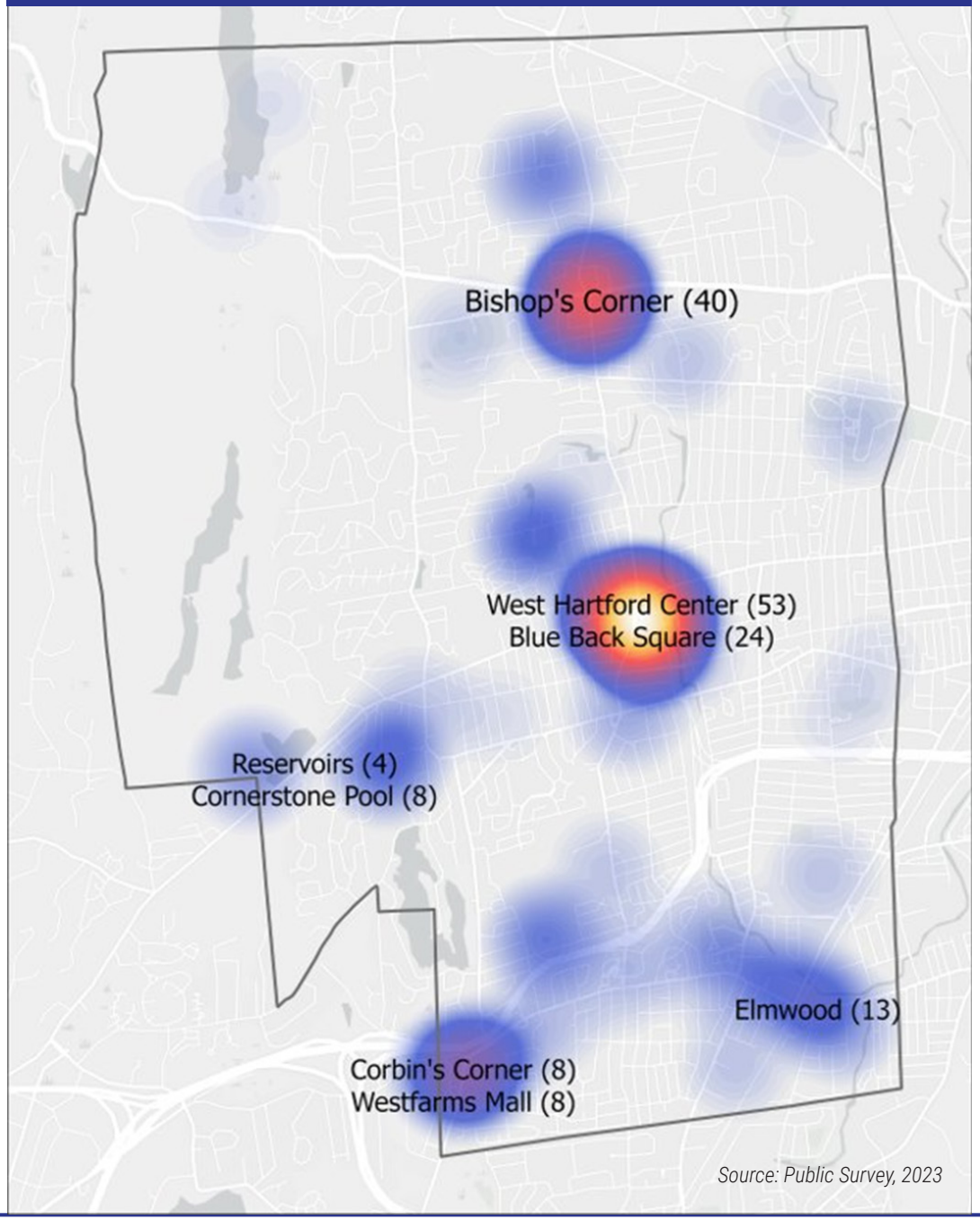


Source: Public Survey, 2023

Participants were asked to indicate on a West Hartford map where they would like to see EV charging stations located (Figure 11).

Community members provide feedback on where they would like to see EV chargers located in West Hartford.

Figure 11. Survey Participants Desired Locations for Public EV Chargers



Source: Public Survey, 2023

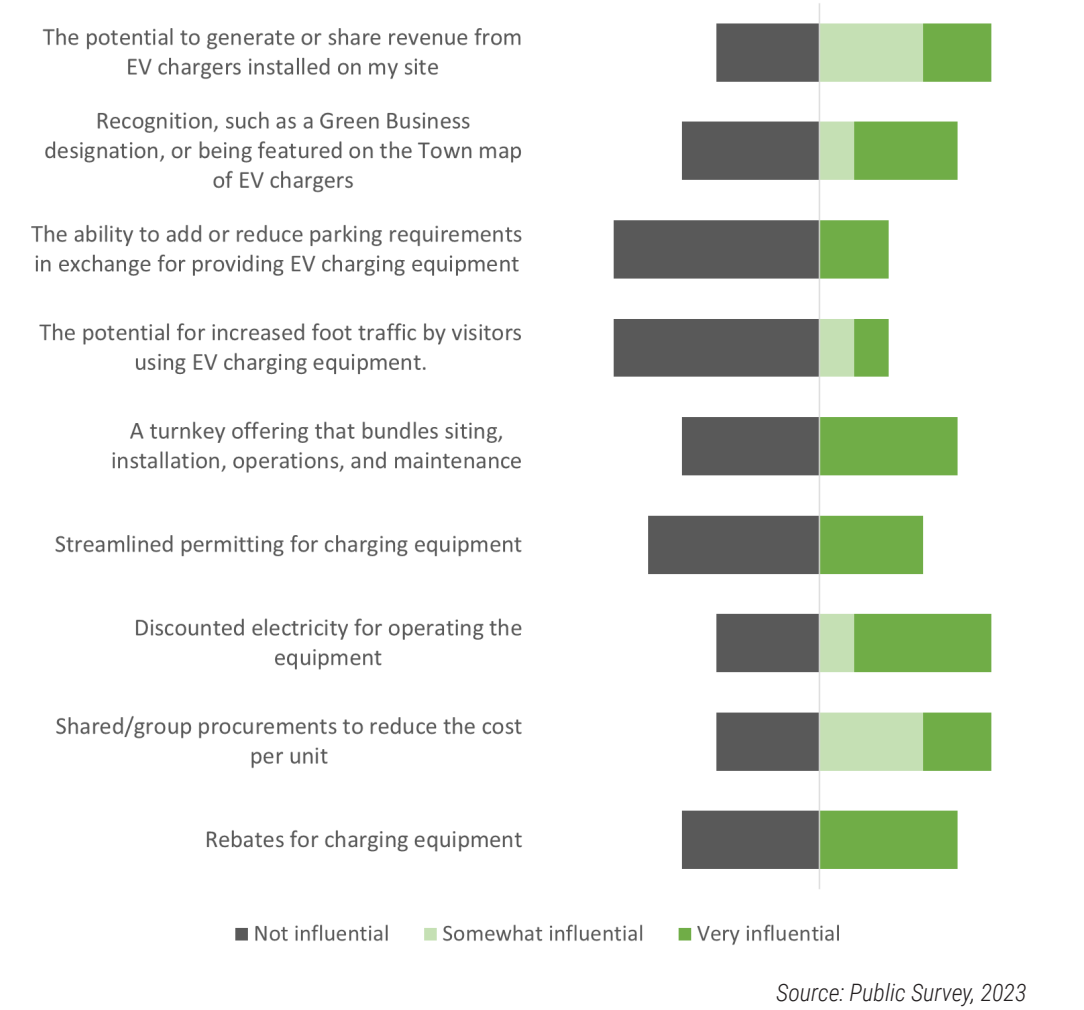
In addition to the public survey, a survey targeted at local businesses was shared with the business community mailing list in May 2023. The business-directed survey received relatively low participation, with only eight (8) respondents. While this response rate is not statistically significant, the results are still informative. One respondent mentioned immediate plans to install an EV charger for employees. However, looking to the future, about two/fifths of participants (38%) said that they would consider EV charger installation if there was little to no cost to their business. The majority of participants (63%) indicated that they were not interested in providing EV charging for customers at this time.

When asked about concerns associated with deploying EV chargers, across the participants the top three concerns all related to costs in various ways:

1. **Ongoing operating costs including electricity.**
2. **The capital cost to purchase and install electric vehicle charging equipment.**
3. **The potential for unforeseen costs such as vandalism and accidental damage.**

Participants were also asked about potential factors that would encourage the installation of EV charging equipment at their business. There were no consensus factors that would influence most participants to install EV charging equipment at their business; however, the most influential factors were associated with economics, whether related to purchasing equipment or revenue generation. At this stage, most participants did not identify EV charging equipment as a potential draw for customers.

Figure 13. Business Survey Results



Source: Public Survey, 2023

2.4.5 Site Suitability Weighting

Based on the survey results and input from Town workshops, the following weighting was developed to inform the suitability model. Because mapping focuses on identifying the best Town-owned sites, commercial, public park, school, and public building land uses received the highest priority, while office, industrial and residential land uses received the lowest priority. Enabling EV infrastructure construction on these privately-owned land uses is a priority for the Town that will be addressed through governance and policy recommendations.

Table 3. Site Suitability Factor Weighting

Factor	Weighting
Land Use Factors	
Commercial Land Use	90
Public Parks	70
Schools	60
Public Building Land Use	50
Institutional Private/Private Recreation	40
Office Land Use	40
Multi-Family Residential Land Use	20
Single-Family Residential Use	10
Transportation Factors	
High-Capacity Garages (>300 spaces)	80
Surface Lots and Small Garages	60
Primary Roads (Excluding limited access)	50
EV AFC Connections	40
Secondary Roads	20
Local Roads	10

2.4.6 Demand and Suitability Analysis

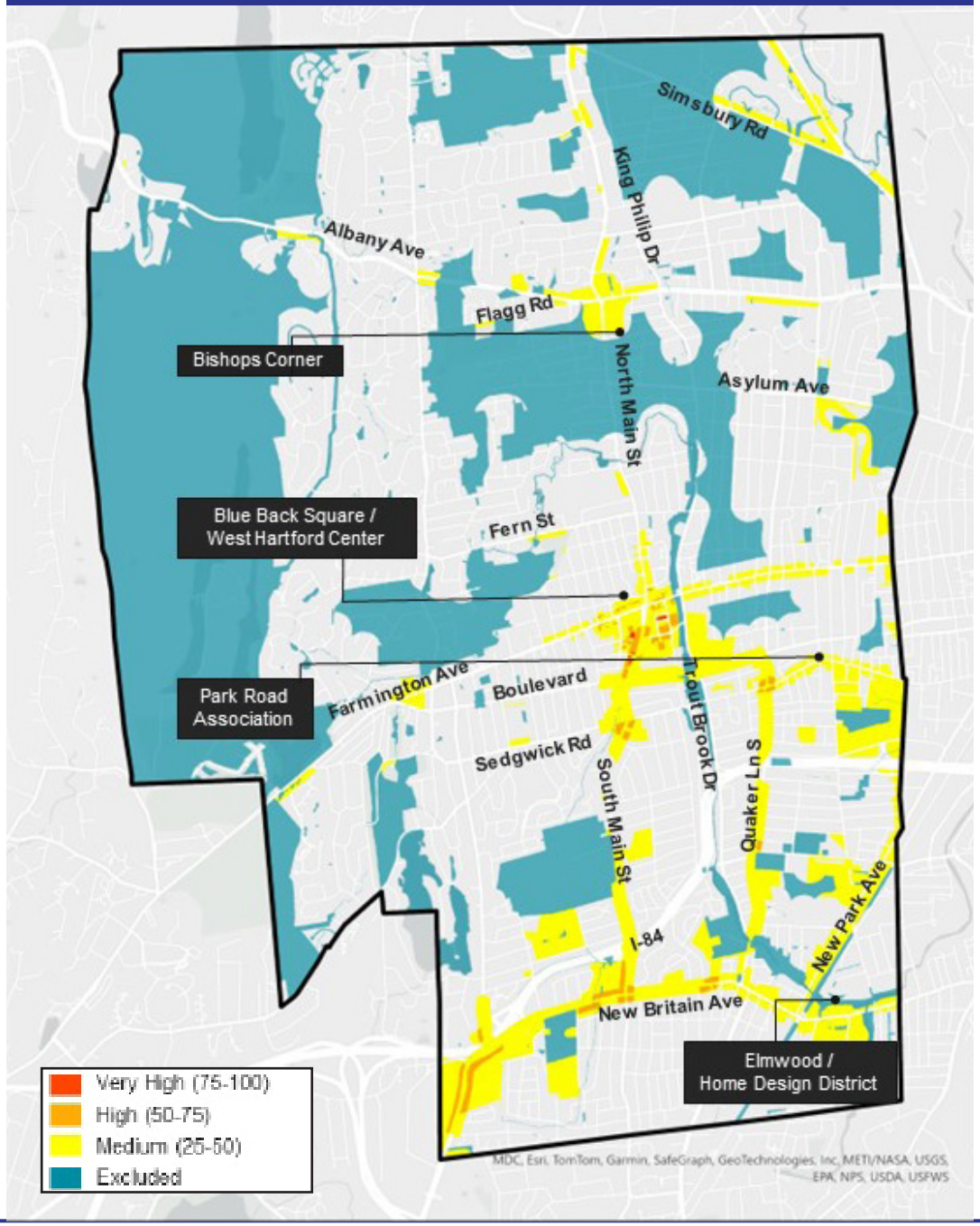
Figure 13. Demand and Suitability Analysis Results shows the results of the suitability analysis, public survey, and the resulting weighting. Areas that show the most promise for EV charging infrastructure based on the GIS-based analysis include:

- West Hartford Center/Blue Back Square: Large parking facilities, including the Isham Garage, Brace Road Lot, Memorial Garage, and Town Center Garage, received the highest scores in the suitability analysis.
- Southwest: Westfarms Shopping Mall and commercial development along New Britain Ave include several locations identified as medium and high suitability for EV charging infrastructure.
- Bishops Corner: Locations surrounding the Albany Avenue and North Main Street intersection were identified as medium suitability and represent highest rankings in the northern portion of West Hartford.
- Southeast: Properties along New Britain Avenue (Route 529) were identified as an area of medium suitability with one area of high suitability near the intersection at Quaker Lane.

Reviewing the mapped analysis of EV charging suitability for West Hartford and considering survey results and upcoming capital improvement projects, the following prioritization is proposed:

- Town-owned parking in Blue Back Square/West Hartford Center including the Arapahoe and Town Hall parking lots and on-street parallel parking along Isham Road.
- Business districts including Park Road (on-street parking near the Playhouse on Park identified as a top priority), Bishops Corner Elmwood/Home Design District, and the New Britain Avenue corridor.
- Town-owned schools and parks, with Walcott Park identified as a top priority.

Figure 13. Demand and Suitability Analysis Results



3. GOVERNANCE, POLICY + CONTRACTING CONSIDERATIONS

3.1 Policy Considerations

While the infrastructure investments recommended throughout this document apply primarily to Town-owned property, the governance framework establishes the policy and regulatory tools to enable and encourage EVSE adoption on privately-owned property. The goal of this policy and governance section is also to discuss new considerations that come with the installation of EV charging infrastructure, in addition to opportunities for coordination across Town departments.

Through this project, the following key policy issues have been discussed. As the Town moves forward with implementation, addressing questions around these evolving issues within the context of EVSE investment will be important.

Table 4. Policy Considerations

Issue	Relevance	Key Considerations	Priority (Low, Med, High)
Procurement	Developing and implementing a clear procurement process will solicit the best possible products and pricing while aligning vendors with Town goals and objectives.	• Pricing schedule • Revenue • Supply chain • Maintenance • Energy costs • Vendor continuity • Specifications	● ● ●
Permitting	Implementing a clear permitting process will drive efficiency in the EV infrastructure build-out and enable coordination across departments.	• Identification of lead agency • Inter-department coordination • Staffing resources • Process determination • Outreach and engagement	● ● ●
Zoning	Merging EV charging infrastructure planning into zoning presents an opportunity for future land uses and development.	• Identification of lead agency • Inter-department coordination • Incentives for private land owners/employers • Coordination with new development • Public engagement	● ● ●
Data Management	A clear data management process can leverage data for planning purposes while addressing privacy and data security.	• Identification of lead agency • Data sharing policy • Vendor continuity • Staffing resources • Data shortage resources • Open records	● ● ●
Equity	Adopting an equitable approach to EV infrastructure build-out will make sure no users are left behind and will position West Hartford as a national leader.	• Identification of lead agency • Siting • Multi-dwelling units • Resources • Public engagement	● ● ●
Fleet Transition	West Hartford can develop a sustainable fleet transition plan that realizes cost savings in coordination with infrastructure recommendations in this document.	• Timing • Vehicle costs • Energy costs • Supply chain • Charging needs • Maintenance • Workforce	● ● ●

3.2 Governance Framework

The policy issues noted in Section 3.1 will have overlapping impacts across several Town departments. Thus, an important next step with the implementation of an action plan will be establishing a clear governance structure around roles and responsibilities. The following table complements governance issues identified as part of this project and defines roles and responsibilities to support implementation and address the identified policy considerations.

Table 5. Governance Roles and Responsibilities

Recommended Next Step	Department Lead	Key Coordinating Departments	Action Item(s)
Update Zoning and Building Codes	Planning & Zoning	Legal Community Development Parking Economic Development Equity Advancement Fire Department	Develop and pass EV Ordinance Review zoning and building codes to add EV considerations Public outreach and engagement around potential updates to relevant codes
Develop Procurement Policy and Approach	Public Works	Legal Purchasing & Procurement Community Development Parking	Update procurement policy to integrate EVSE projects Develop RFP and contract template for EVSE projects Private sector engagement around proposed contracting terms and specifications
Site Development Requirements	Community Development	Public Works Planning & Zoning Parking Engineering Purchasing & Procurement Equity Advancement Fire Department	Establish EVSE-ready / EVSE-equipped parking requirements Develop code enforcement policy and procedures Engagement with fire department Public outreach and engagement around proposed requirements
Parking Regulations	Parking	Public Works Planning & Zoning Community Development Economic Development Buildings Legal	Advise Council on parking rates / penalties Develop enforcement process for EVSE-equipped parking Public outreach and engagement, including business community Track and update ADA requirements
Pricing/ Incentives Coordination	Public Works	Parking Economic Development Planning & Zoning Community Development Legal Equity Advancement	Evaluate municipal EV incentive programs nationally Align potential EVSE installation incentives with EV charging demand and development plans Analyze opportunities to support equitable deployment of EVSE within Town, including multi-resident housing Coordinate with State

Table 5 (continued): Governance Roles and Responsibilities

Recommended Next Step	Department Lead	Key Coordinating Agencies	Action Item(s)
Utility Coordination	Public Works	Engineering Planning & Zoning Community Development Legal	Continue engagement with utility providers Vetting of proposed siting and requirements Discuss potential partnership around incentive programs
Funding	Public Works	Legal Purchasing & Procurement Community Development Parking	Update procurement policy to integrate EVSE projects Develop RFP and contract template for EVSE projects Private sector engagement around proposed contracting terms and specifications

3.3 Coordination with State DOT

Any actions taken to address the policy issues noted above and implementing governance next steps should be done in coordination with the State. Engagement with the State ensures tracking and providing input on legislative efforts that may impact implementation efforts as part of this project. There is also the important opportunity to coordinate around use of the State's NEVI funding to align long-distance charging along highway corridors with the placement of community chargers in West Hartford.

3.4 Zoning and Building Codes

EVs are still a relatively new technology, and uniform guidance on charging infrastructure and implementation standards vary by federal, state, and local policies and guidance. Municipalities are beginning to incorporate EV charger requirements and site design into building codes, ordinances, and zoning requirements.

California and New York have developed standards and regulations for chargers in residential and commercial land uses. The State of Connecticut also amended its current building codes to address EV charging. The 2018 State Building Code for Connecticut requires new residential garages to accommodate Level 1 EV chargers, based on the 2015 International Code Council (ICC) standards. The State also adopted the 2020 ICC new voluntary changes that would require the installation of EV capable equipment for supporting Level 2 charging in single and multi-family homes. While the current building code does not have requirements for number of Level 2 EV-Ready Charging Spaces in new garages, the Connecticut Department of Energy and Environmental Protection (DEEP) recommends the State Building Code require at least 10 percent of all parking spaces accommodate the future installation of a Level 2 (220- or 240-volt) EV chargers. The following table provides the recommended number of spaces based on number of total parking spaces available.

Table 6. Recommended EVSE-Ready Parking Spaces

Total # of Parking Spaces	Number of Required Level 2 EV-Ready Spaces	Recommended for Residential Developments
0-9	1	2
10-25	2	4
26-50	4	8
51-75	6	
76-100	12	
101-150	12	
151-200	17	
201 and over	10% of total spaces	

Regulations are primarily left to local municipalities. Currently, West Hartford does not have specific zoning requirements for electric vehicles. Through the Sustainable CT program, West Hartford received free technical assistance and access to Guidance on EV Ordinances compiled by the Great Plains Institute, a Minnesota-based non-profit. However, it can also adopt from nearby municipalities like Hartford and Middletown. Middletown, Connecticut issued supplementary regulations that required new developments with over 25 parking spaces to provide a minimum of one charging space or 3% of the total number of parking spaces for EVs.

EVSE parking requirements typically fall into three categories:

- **EV-capable** spaces are equipped with electrical panel capacity, a conduit or runway to a parking space, and sufficient clearance to install a future EV charging station.
- **EV-ready** spaces are equipped with all of the above as well as wiring and an outlet for chariging (everything but the charger itself and any associated signage).
- **EV-equipped** spaces include all of the above as well as the charger and any associated signage.

By establishing requirements for EV-capable and EV-ready parking minimums, municipalities can help avoid expensive retrofit costs down the line at minimal cost to developers and property owners.

3.5 Contracting Models

Site Host Owner-Operator

In this model, a property owner purchases equipment from a vendor, works with a contractor to install it (or installs it using their own staff), and retains responsibility for operations and maintenance.

Benefits	Limitations
• Long-term control over service quality • All revenue goes to site host	• High upfront capital cost • Site host owns all risk • Site host responsible for maintenance, operations, and billing

Utility Ownership Subsidy

In this model, the electric utility delivers additional components beyond their normal course of business on the customer side of the meter, including upgrades to the electrical panel and facility wiring (known as the "make ready" model) and/or owning and operating the charging infrastructure. Eversource, the electric utility serving West Hartford, does not currently offer a utility ownership model for EVSE.

Benefits	Limitations
• Shares risks for equipment maintenance, obsolescence, and low utilization • Lower upfront capital cost	• Less control over service quality • Less control over pricing

Third Party Owner-Operator

In this model, a site host contracts with a third party to handle some or all ownership, operation, maintenance, and billing responsibilities. In some cases, the site host may earn rental income from the owner-operator.

Benefits	Limitations
• Releases site owner from some combination of installation, operations, maintenance, and billing • Transfers risk for equipment maintenance, obsolescence, and low utilization • Potential to earn rental income	• Less control over service quality • Some or all revenue goes to third-party

Infrastructure/Charging-As-A-Service

In this model, the site host contracts with a third party to deliver a turnkey solution. The third party pays upfront capital costs and owns the equipment in exchange for a monthly fee paid by the site host. There are a range of public-private partnership models with varying levels of site host participation and risk.

Benefits	Limitations
• Low to no capital costs • Releases site owner from most or all responsibilities • Transfers most risk to third party • Range of options	• Less control over service quality • Higher long-term cost

Town-Preferred Model

Town leadership participated in a series of workshops to discuss contracting options and identify the roles and responsibilities best suited for Town ownership and which would be best to outsource to a third party. The combination of Town responsibilities and outsourced roles identified during this process aligns most closely with the Third-Party Owner-Operator role, but with the Town maintaining ownership of the equipment and setting pricing.

Town Ownership	Contracted Roles
• Zoning and building code • Permitting • Contract(s) management • Equipment ownership • Pricing • Parking violations • Spare/replacement parts	• Installation • Equipment maintenance and repairs • Payment and billing back-office functions

Source: Adobe

3.6 Pricing

There are three primary pricing models used for public EV charging infrastructure: free use as an amenity; a nominal fee to cover costs; and charging higher fees to generate revenue. Because the West Hartford Town Council must approve fee structures, the Town will need set pricing for EVSE on Town-owned property. The primary objective in setting pricing will be to enable long-term, reliable operations of equipment while minimizing user costs. The fees will need to cover the cost of equipment acquisition, installation, and operating and maintenance costs charged to the Town by the third-party operator.

A formula for setting fees rather than an explicit fee structure is recommended. The components of this fee would include a per kWh charge based on the EverSource rate schedule for EV charging plus an added percentage or fixed fee per charge to cover capital and installation costs for Town-owned equipment and spare/replacement parts, third-party operations and maintenance, transaction fees, and a nominal contingency. The exact pricing will be determined based on the pricing West Hartford negotiates for each of these components during the bidding process.

3.6.1. Parking Payment Integration

To provide a seamless customer experience, the Town will seek payment integration to allow a single "park-and-charge" transaction at Town-owned garages and lots. Payment integration will be a hybrid role shared by the Town and its respective parking and charging vendors with the following requirements:

EVSE vendors:

- Provide application programming interface (API) for integration with payment vendor.
- Include dwell time beyond full charge for enforcement.
- No subscription required.
- Established fee schedule based on rates set by Council.

Parking vendors:

- Hardware agnostic and experience integrating multiple EVSE vendors into payment ecosystem.
- Allow payment by app, mobile wallet, kiosk, etc.
- Include cash payment option or cash to card conversion.
- No subscription required.
- Enforcement capabilities.
- Established fee schedule based on rates set by Council.


Source: Adobe

Global and National EV Policy Issues

BATTERY MATERIAL MINING:
Global attention focused on the human rights abuses and environmental risks in the mining of materials used to manufacture batteries including child and forced labor in mines, storage of waste products from the mining process, and water pollution and stress in arid regions. Policymakers, manufacturers, and activists are working to mitigate these risks, though more work will be needed. International organizations such as the Initiative for Responsible Mining Assurance are evaluating ways to make mining more socially and environmentally responsible and have the attention of world governments. The United States and other world governments are currently investing in developing domestic supply chains, which will limit exposure to human rights and environmental abuses. While not a perfect solution, diversifying the upstream supply chain will increase the leverage of midstream and downstream companies have in sourcing ethical products.[4]

SUPPLY CHAIN, TRANSACTION PRICES, AND MODEL AVAILABILITY:
The COVID-19 global pandemic created significant supply chain constraints as factories were temporarily shuttered, international trade slowed down, and consumer demand increased. The automotive manufacturing industry was especially impacted, delivering about 15% fewer new vehicles in 2020 compared to 2019. Average new car transaction prices also increased by about $10,000 between the end of 2019 and July 2023, driven by a combination of shifting vehicle preferences (from sedans to trucks and sport utility vehicles), transaction prices above the manufacturer's suggested retail price, and the removal of lower vehicle trim levels from the market.

The Inflation Reduction Act (IRA) includes a number of investments to improve the EV supply chain including domestic incentives for new battery production. However, it will likely take years if not a decade until some of these investments come online. Another key component of the IRA is incentives for used EVs. For individuals with adjusted gross incomes under $75,000 (and $150,000 for married individuals filing jointly), the IRA offers a tax credit of 30% of the vehicle purchase price up to a maximum of $4,000. While this will not fully close the affordability gap or resolve supply chain constraints for new EVs, it will make EV ownership more achievable for many.

GRID POWER GENERATION:
As EV adoption increases, many people wonder whether the grid will be able to support the demand for more power. Recent analysis by Consumer Reports shows that electrifying 100% of passenger vehicles by 2050 will only require about 1% per year growth in electricity generation. This analysis is based on the following assumptions[5]:

- The average new EV can drive about 3 miles per kilowatt hour.
- An estimated 4.2 trillion kilowatt hours of electricity was generated in 2022.
- Americans drive about 2.9 trillion miles per year, translating to an additional 950 billion kilowatt hours at 100% EV adoption. This represents a 22% increase over current generation.

In short, power generation demand will increase, but at an annual level that most electric utilities indicate they can achieve. Further, most charging will occur overnight when demand is lowest. Most electric utilities reduce generation overnight, meaning that it is possible to utilize existing generation sources to meet much of the anticipated increase in demand.

[4] The EV Battery Supply Chain Explained - RMI

[5] Blog: Can the Grid Handle EVs? Yes! (consumerreports.org) I

4. SITE REQUIREMENTS

Current resources from the New York State Energy Research and Development Authority, the Transportation and Climate Initiative, the Rocky Mountain Institute, the California Governor's Office of Business and Economic Development, and the U.S. Access Board offer general recommendations for safe, accessible, and effective charging stations in parking lots, parking garages, and on-street parking for standard and ADA accessible spaces.

Building on the requirements and guidance from state and local offices and organizations, mainly using the Transportation and Climate Initiative's report[6] , the City of Seattle's requirements[7] , NYC Department of Transportation's EV guide[8] , and the U.S. Access Board guidelines[9], the consulting team established site requirements to meet the needs and constraints of West Hartford's parking facilities and supply. Through multiple rounds of stakeholder and Town staff workshops, these requirements were refined to the list below to address all aspects of EV charging from charger placement (mounted, free standing, etc) to futureproofing requirements.

[6] "Siting and Design Guidelines for Electric Vehicle Supply Equipment," 2012

[7] "Curbside Level 2 Charging: Minimum Requirements for Curbside EV Charger Locations," 2022

[8] "Curb Enthusiasm: Deployment Guide for On-Street Electric Vehicle Charging," 2018

[9] "Design Recommendations for Accessible Electric Vehicle Charging Stations," 2023

4.1 Parking Typologies

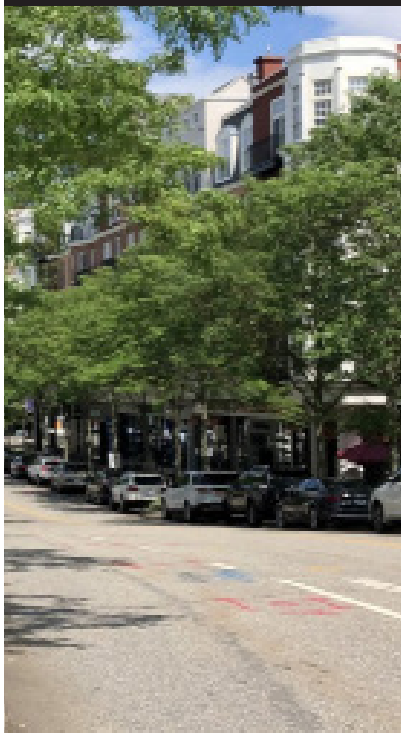
Parking in West Hartford falls into three categories: parking garage, parking lot, and on-street parking. West Hartford has two municipal parking garages—Memorial Garage and Isham Garage—and two municipal parking lots – Brace Road Lot and Farmington Avenue Lot. On-street parking is metered in West Hartford Center and Blue Back Square, with the presence of kiosks.

The following requirements were developed for all three typologies in West Hartford.

Parking Garage

Parking Lot

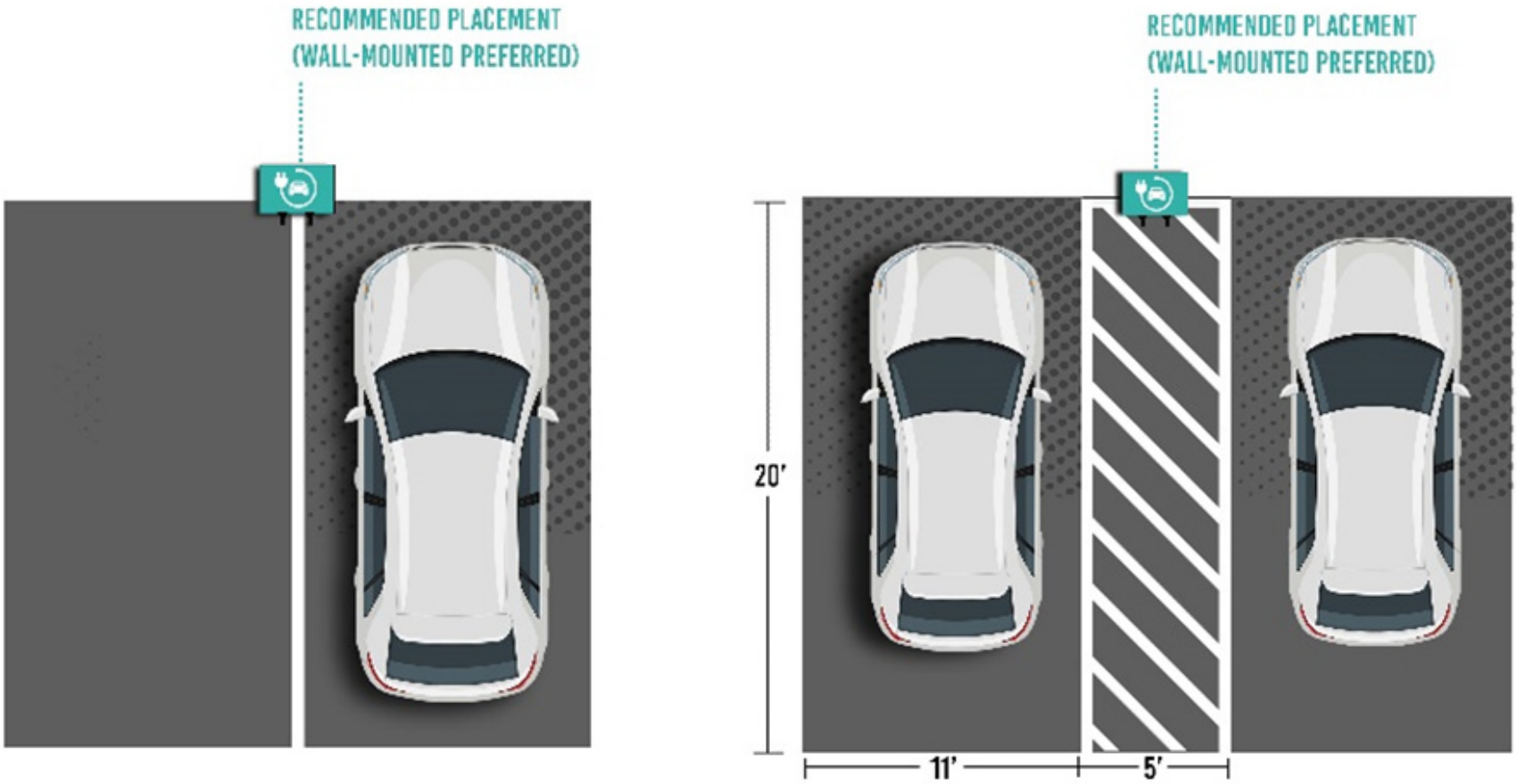
On-Street Parking



Garage in West Hartford Center

1. **Chargers are positioned head on, centered between two spaces. May be wall mounted or free standing. Vehicles can park head in or back in, depending on port location in vehicles.**
2. **Standard Space Dimensions: Minimum 18 feet by 9 feet**
3. **ADA Space Dimensions: 20 feet by 11 feet, with a 5-foot access aisle**

Figure 14. Recommended Parking Space Dimension and Charger Placement in a Garage Facility



Parking Lot in Neighborhood District

1. Charger positioned head on, centered between two spaces on median or barrier. Charger is free standing. Vehicles can park head in or back in, depending on port location in vehicles.
2. Standard Space Dimensions: Minimum 18 feet by 9 feet
3. ADA Space Dimensions: 20 feet by 11 feet, with a 5-foot access aisle

Figure 15. Recommended Parking Space Dimension and Charger Placement in a Lot

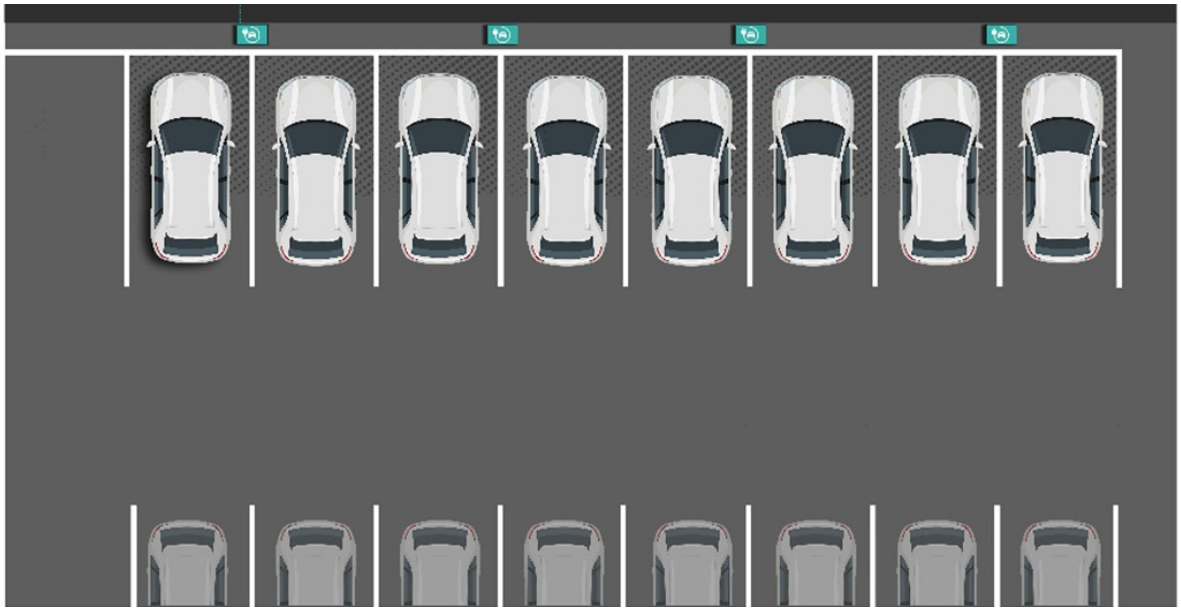
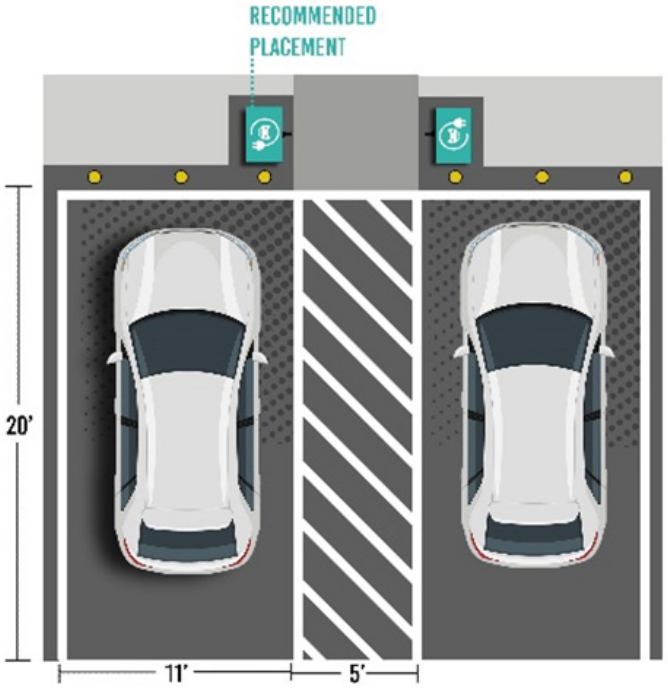


Figure 16. Recommended ADA Parking Space Dimension and Charger Placement in a Lot



On-Street Parking

1. Charger centered between two spaces
2. Install charger as close as possible to curbside, not conflicting with clear zones behind charger. View table below for minimum dimensions
3. Install concrete-filled steel bollards where appropriate.
4. Standard Space Dimensions for Parallel Parking: Minimum 20 feet by 8 feet
5. ADA parallel parking requires 5-foot accessible path on sidewalk
6. Standard Space Dimensions for Angled Parking: 20 ft length, 9 ft width for charging port access. Front-in parking allows for better charging visibility. For back-in, install bollards

Figure 17. Recommended Parking Space Dimension and Charger Placement On-Street

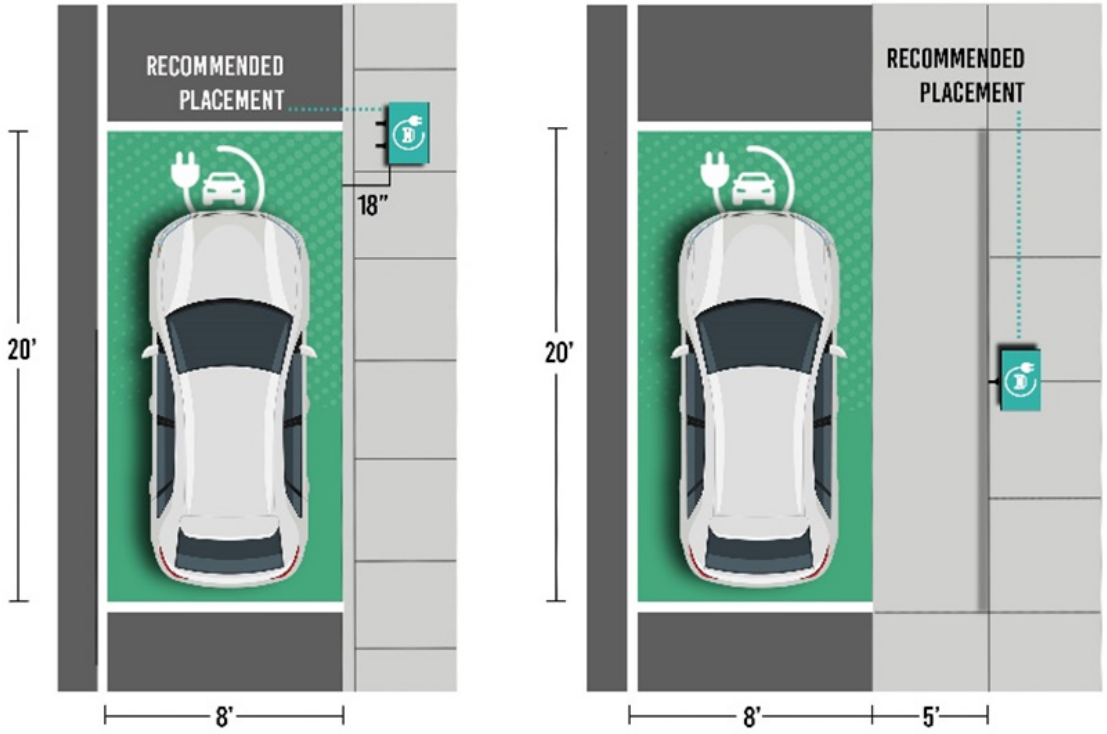
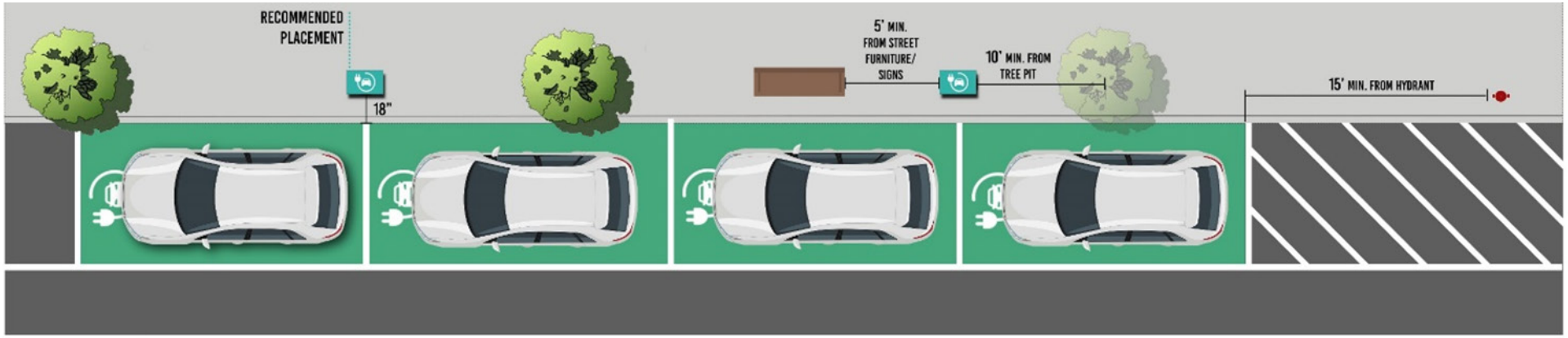


Table 7. Recommended Street Element Placement and Dimensions

Recommended Next Step	STREET ELEMENT							
	6' Sidewalk	8'+ Sidewalk	Cycle Lane/ Track	Loading Zone	Street Trees	Driveway	Fire Hydrant	Additional Signage
Charger Orientation	Install narrowest dimension perpendicular to curb (typically facing the sidewalk or street)	Any orientation is acceptable						
Minimum Charger Spacing	18" setback from curb	18" setback from curb	6" offset	5-10' vertical clearance	10' from trunk of tree or 5' from tree pit to charger	8' between EV charger and space	15' between EV charger and hydrant	5' from signs and legal furniture

Figure 18. Recommended Parking Space Dimension and Charger Placement On-Street in Relation to Other Curbside Fixtures



4.2 EV Elements

Installing the proper EV charging elements are important for a safe and seamless process for users charging their vehicles. Guidelines and requirements for EV charging elements are outlined below for electric and customer usage metering, lighting, wayfinding and signage, hardwire equipment, charging connectors and plugs, charging capacity, and adhering to state EV charging standards. These elements must be administered at all parking typologies, unless otherwise noted.

4.2.1 Electric Metering Requirements

- Only one (1) meter per site
- Separate metering/sub-metering for EVSE (per site not per charger)
- Follow electric utility requirements for metering, including provision of wireless communications
- Dedicated electrical circuit, which can be added into existing panel or may require additional panel

4.2.2 Customer Usage Metering Requirements

- Smart meters must be connected through a network connection to the utility
- Provide a network connection, preferably via cellular, that tracks usage, bills customers, and manages electrical loads
- Integrated payment technology

4.2.3 Lighting Requirements

- Minimum 0.5 horizontal footcandle
- LED street lighting (3 categories):
    1. Overhead (existing)
    2. Pedestrian (existing)
    3. EV charging station (backlit touch-screens)

4.2.4 Signage and Wayfinding

- Spaces marked with letters that are min. 12 in. long "EV CHARGING ONLY"
- Locate wayfinding signs on adjacent streets and on pavement to direct drivers to EV charger locations
- EV space signage to communicate rules, guidelines, and information for parking in EV spaces and operating equipment, such as:
    - "Electric Vehicle Charging Station"
    - "Electric vehicle parking while charging only"
    - Description on how to use the machine

4.2.5 Equipment

- Secure mounting and fastening
- Hot swappable equipment
- Use rugged hardware such as aluminum enclosures, lockable charge connector, powder coated enclosure resistant to graffiti, retractable cable management system
- If charger is free standing, install on pedestal with tall masts to avoid snowplows
- Install disconnect switches and allow enough space and protection from collision
- No advertising allowed

4.2.6 Proximity to Building Entrance

- Consider preferential placement; balance with location of power access.
- Chargers placed at a distance away from building and overhead power lines, and outside of floodplains
- Locate in high visibility area

4.2.7 Recommended EV Charger Standards

- EV charging cables must not exceed 25 feet in length (15 ft cord is favorable, except for on-street)
- Charging cables must retract and be off ground when not in use
- Chargers should include on-board diagnostics for rapid field repair
- 3-5 ft distance between charger and vehicle
- No more than two charging ports placed side-by-side
- Keep charging cable off the ground and off vehicle surface

Cable standards are likely to evolve in the coming years as flat cables, "bring your own cable" EV charging stations, and wireless charging emerge in the EVSE market. Wireless charging is discussed further in Section 4.4, Futureproofing for Emerging Technologies.

4.2.8 State (CT) Standards for Charging Equipped

- EV charging systems should be labeled and listed in accordance with UL 2202 and UL 2594

4.2.9 Standards for Charging Capacity

- 40-ampere minimum, but the Town will use 50-60-amp, up to 14 KW per hour, acceptable , 208/240-volt branch circuit per EV parking space, with conduits underground and surface mounted

4.2.10 LV and DCFC Charger Installation

- Free-standing with conduit preferred
- Wall mounting acceptable in parking garages
- Can be connected to an underground vault. For DCFC, connect to underground vault or transformer

4.3 ADA Recommendations

ADA requirements for accessible EV charging spaces is still in the nascent phase, and federal recommendations and requirements continue to be revised and updated as EV charging grows and becomes mainstream.

As of 2023, the Access Board recommends parking spaces in lot and garages are a minimum of 20 feet length and 11 feet width, with a 5-foot access aisle. For on-street ADA accessible spaces, spaces should be 20 feet long and 8 feet wide, with a 5-foot-wide ramp or street-level sidewalk. Connecticut code requires accessible spaces to be a minimum of 11 feet wide with a 5-foot access aisle. Per 2021 CT IBC, at least one (1) space, but not less than 5% of vehicle spaces on the site served by EV charging systems, should be accessible. 2021 CT IBC also states that at least one space, but not less than 5% of vehicle spaces on the site served by EV charging systems, should be accessible, except charging stations in buildings designated as R-2, R-3, and R-4. In parking garages, sites must provide an accessible route that connects to pedestrian entrance with minimum vertical clearance of 98 in.

As these regulations continue to be developed, it is recommended that legal counsel be engaged to determine any risks related to ADA requirements and the still evolving standards related to the placement of EVSE and accessibility.

Example of an EV Charging parking space with ADA accommodation. (Source: Nave Newell)

4.4 Future-Proofing for Emerging Technologies

The growth of EV adoption and the evolution of supporting technologies will mean that the charging infrastructure of 2030 won't meet the needs and expectations of 2050. While these technologies are beyond the scope considered for this project, there are several ongoing industry developments that will impact the future of zero emissions transportation.

4.4.1 Inductive Charging

Inductive charging allows an equipped vehicle to receive power without plugging in by driving over a wireless charging pad. There are three types of inductive charging:

- Static charging in which a vehicle is parked for a long period of time.
- Quasi-dynamic charging, in which a vehicle is stopped or driving slowly over the charger for a few minutes at a time, such as an intersection or transit stop.
- Dynamic charging, in which a vehicle is operating at travel speeds.

Inductive charging is already being used on transit vehicles and may someday emerge as a viable option for both Town fleet and personal vehicles. They are two primary benefits of inductive charging:

- The ability to "top off" the battery while driving, reducing trip interruptions to charge.
- Increased flexibility in designing parking facilities, without the need to account for cords and wall mounted equipment.
- In the long-run, the ability to reduce battery capacity and cost as cars can travel continuously as they drive.

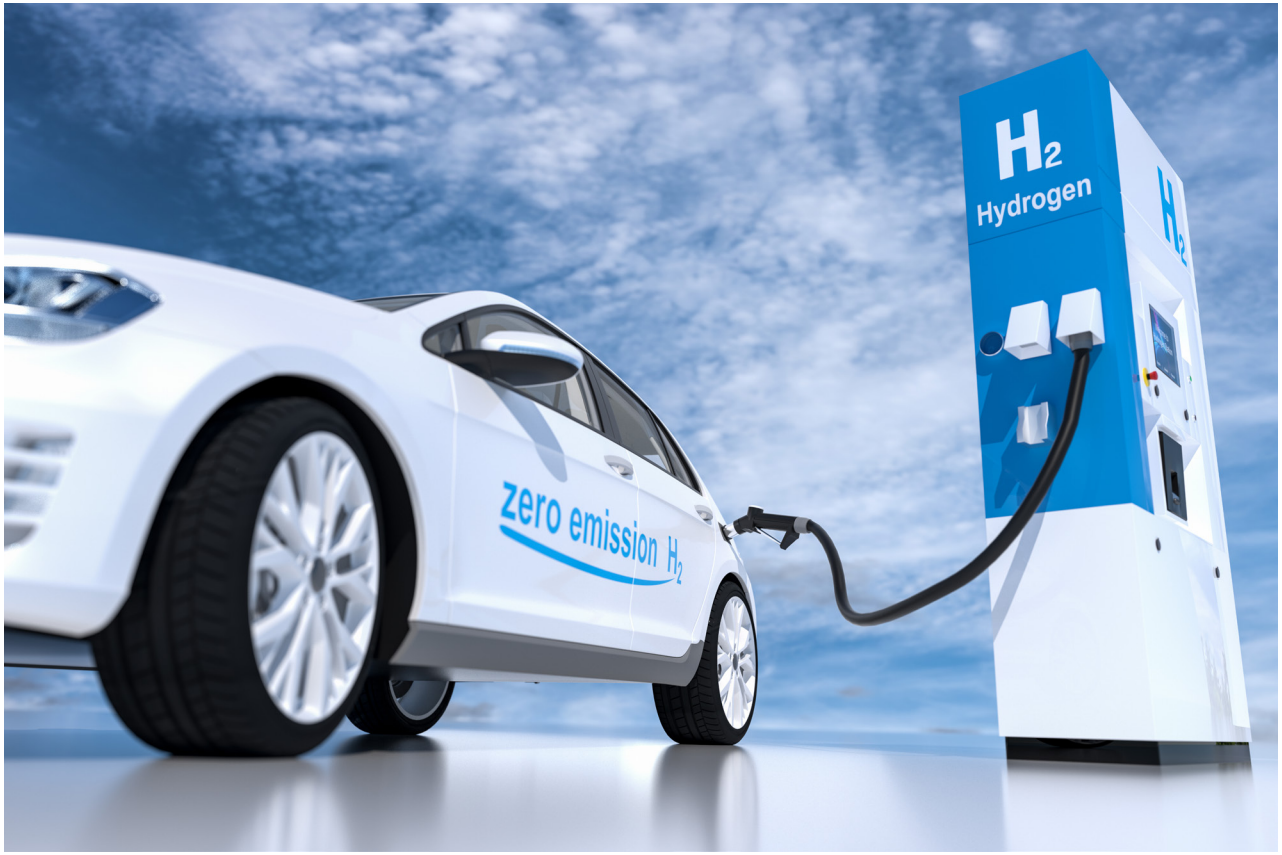
Inductive charging requires special equipment to work and may not be widely available for personal vehicles for some time. The infrastructure investment and power needs for dynamic charging will be extensive, meaning this technology is likely decades away from being readily available. While dynamic charging infrastructure is most likely to be installed in highways, West Hartford may consider how static charging can be used to minimize obstacles in Town-owned parking facilities and support the needs of the Town fleet as this technology matures.

Source: Adobe

4.4.2 Hydrogen Fueling

Hydrogen fuel cell electric vehicles (FCEVs) convert hydrogen into electricity to operate the same type of motors that EVs use, with water as the only byproduct and no "tailpipe" emissions. The primary benefits of FCEVs compared to EVs is that they have a similar driving range and refueling time as internal combustion engines. However, there are currently only two passenger FCEVs on the market as of the end of 2023. One of the primary limitations, and the reason for the relatively small market presence, is a lack of infrastructure to refine and distribute hydrogen. Because of the need to install specialized and costly infrastructure to refuel FCEVs, most models on the market are medium- and heavy-duty fleet vehicles such as transit buses.

If personal FCEVs become as common as EVs in the future, the refueling infrastructure will likely follow a similar pattern as gas and service stations today. Because of the ability to refuel quickly, public infrastructure to support overnight and "opportunity" charging will likely not be required. However, West Hartford may consider what role FCEVs can play in the Town fleet for medium- and heavy-duty vehicles.



Source: Adobe

4.4.3 Vehicle-to-Grid

Widespread adoption of EVs will create future opportunities to support bidirectional charging, also known as vehicle-to-grid. One of the primary challenges in operating the power grid is supporting sudden spikes in demand, which often require powering up the dirtiest generation sources like coal. EVs can help fill this gap by providing power to the grid while vehicles are parked, particularly during the workday and early evening when demand on the grid is the highest. During power outages, EV batteries could also be used to power homes and businesses. While some EV models support "vehicle-to-load" charging, in which owners can power external devices with their battery, there are not yet any vehicles with true vehicle-to-grid capabilities. There remain several obstacles to widespread implementation of this capability, including the development of standards and charging management technologies and continued collaboration between electric utilities and automakers. As these advancements reach commercial scale, West Hartford will consider how vehicle-to-grid can support its own power needs for municipal buildings while monitoring international and national standards on building codes for bidirectional charging equipment.

Source: Adobe

5. IMPLEMENTATION PLAN

5.1 Stakeholder, Public and State Agency Engagement

West Hartford leadership will utilize this draft document to **engage Town Council and relevant committees (1)**, such as the Town Plan and Zoning Commission and the Sustainability Advisory Group, in refining and implementing the recommended strategies. In advance of the next round of federal discretionary funding for EV infrastructure, Town staff will also **continue public and stakeholder engagement (2)** as it makes key investment decisions and establishes enabling policy for widespread adoption. This will include coordination with Eversource and the Connecticut Department of Transportation will ensure Town priorities leverage statewide and regional transportation and utility infrastructure investments and funding sources. Finally, West Hartford will utilize the recommendations in this document to **advance its Sustainable Connecticut certification (3)**. A summary of potential certification activities associated with this plan and their point value in the Sustainable Connecticut rating process is presented in the following table.

Table 8. Potential Sustainable Connecticut Certification Actions

Action	Point Value
EV Infrastructure Planning and Installation	
6.4.4 - Conduct an assessment of where ZEV charging infrastructure is needed in the community. Identify the areas within your town that have the appropriate characteristics to host charging and if not the exact right properties, then the approximate neighborhoods.	10 points
6.4.5 - Install electric vehicle charging stations (Electric Vehicle Supply Equipment) for public use in at least one location. If the electric vehicle charging station is not sited on municipal property, include an explanation of why an alternative location was selected and demonstrate proof of purchase by the municipality.	Install EV charging stations in: 1-2 locations = 5 points 2-5 locations = 10 points 6+ locations = 15 points
EV Education and Training	
6.4.1 - Sponsor or host a zero emission vehicle ZEV promotional event or education workshop with a community partner or third party.	5 points
6.4.2 - Have at least one municipal elected official and/or staff member and/or member of a relevant commission participate in a training related to electrification of municipal vehicles.	5 points
Municipal Fleet Strategies	
6.6.1 a - Inventory the existing fleet, including the total quantity of vehicles (cars, carts, trucks, tractors, buses, construction equipment). Itemize the number of vehicles that have different fuel sources.	20 points
6.4.3 Replace municipal fleet vehicles to reduce emissions	Up to 40 points
Replace Medium and Heavy Duty (MHD) Vehicles (vehicles with a gross vehicle weight rating of over 10,000 pounds, such as large pickup trucks, large vans, delivery and box trucks, school buses, transit buses, and long-haul tractor trailers)	40% of MHD fleet = 10 points 70% of MHD fleet = 15 points 100% of MHD fleet = 20 points
Replace Light-Duty Vehicles (vehicles with a gross vehicle weight rating of 8,500 pounds or less, such as passenger cars, sport utility vehicles, and pickup trucks	40% of MHD fleet = 10 points 70% of MHD fleet = 15 points 100% of MHD fleet = 20 points

5.2 Infrastructure Prioritization

Based on technical analysis, survey results, and workshops with Town staff, **building new EV infrastructure at Town-owned parking in Blue Back Square/West Hartford Center (4)** is the top investment priority. Isham Garage, Brace Road Lot, Memorial Garage, and Town Center Garage, all Town-owned and listed in order of prioritization, represent the best opportunities for public investment.

Following buildout in Blue Back Square/West Hartford Center, **building new EV infrastructure at Town parks and schools (5)** will be the Town's next priority. While the demand and suitability model did not score these as highly as some neighborhood business districts, survey responses prioritized these locations. Public ownership of these land uses will allow Town investment and management of project development activities.

5.3. Enabling Funding

During early project workshops, two primary funding sources were identified to implement publicly accessible charging in West Hartford. To make the most of these funding sources and demonstrate its commitment to implementing the plan, the Town must first identify a **local funding source to achieve any required local match (6)**. One potential source of non-federal match could be Eversource funding for charging infrastructure installation. These incentives include up to 100% of the make-ready costs and up to 50% of the cost of equipment. This program is highly competitive, so the Town will need to continue engagement with Eversource and **submit an application to the Connecticute Electric Vehicle (EV) Charging Program (7)**. Development of a large, integrated program that includes Town and federal funding could enhance West Hartford's chance of success.

The Charging and Fueling Infrastructure (CFI) Program provides an 80% federal match to state and local agencies to install corridor and community charging, with an award range of $500,000 to $15 million. The CFI Program will award funding on an annual basis with an application window sometime during the summer. The Town will scope its request based on the amount of non-federal matching funding available, with the potential to **prepare and submit a CFI grant application (8)** in the 2024 round of funding or a later year. The following schedule assumes a phased approach, but all proposed infrastructure investments would be possible within the maximum annual award size.

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5.4 Enabling Project Development Abilities

In advance of submitting a CFI grant application and after receiving funding if successful, the following project development activities will be required:

Perform site feasibility assessments of sites included in CFI application (9): Confirmation of the current and required electrical and civil infrastructure assets will be required to develop cost estimates for the CFI application.

Engage EV infrastructure vendors (10): As the Town solidifies its program, vendor meet-and-greets can help inform and validate cost and contracting assumptions.

Develop procurement for Town-owned chargers (11): The Town will need to develop procurement requirements and documentation to solicit a vendor and qualified contractor(s).

Charger design and installation (12): A qualified contractor will be hired to design and install equipment and perform any required civil or facility upgrades to meet the applicable design guidance standards.

Develop procurement for payment vendor (13): Because the Town desired a park-and-charge model, a procurement may be required to facilitate system integration (14) between the selected charging equipment vendor and existing Town parking payment systems.

Operations, maintenance, and performance monitoring (15): The CFI program requires a minimum of five years of equipment operations and sets forth specific performance reporting metrics. In addition to these requirements, the Town may collect this data to inform its own operations and future decision-making regarding charging equipment.

5.5. Enabling Policy to Encourage Adoption throughout West Hartford

While most of the investments described in this document will impact primarily Town-owned sites, West Hartford will seek policy and regulatory changes to future-proof for more widespread EV charger installation. The Town will explore **revisions to zoning and building code to set minimum EVSE-ready standards (16)**. These may include parking minimums for certain land uses and implementation of the site design, electrical, and accessibility requirements described earlier in this document.

West Hartford Town Council must approve pricing for all revenue-generating activities. Before advancing the project development activities described above, West Hartford staff will **collaborate with Town Council to set pricing with flexibility to make future changes administratively (17)**. While West Hartford does not intend for EV charging to generate revenue for the Town, establishing a pricing formula instead of a fixed rate will allow Town staff to respond nimbly to changes in operating costs.

Finally, the Town will **explore development of a program to encourage EVSE installation on properties in prioritized neighborhoods (18)**. Commercial districts, such as Bishops Corner, Elmwood/Home Design District, and the New Britain Avenue corridor, scored highly in the suitability analysis. Because these sites are privately owned, the Town will work with the neighborhood business associations to communicate to potential site hosts the need for charging infrastructure and enabling actions by the Town to streamline implementation. The Town will also **consider facilitating a shared procurement mechanism (19)** which could lower unit pricing or potentially leverage the EverSource Connecticut EV Charging Program as a bundled application.

Table 9. Summary Recommendations with Timelines

	2023	2024				2025				2026			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Public and Stakeholder Engagement													
1. Engage Town Council and Relevant Committees on Plan Recommendations	■	■											
2. Advance Sustainable Connecticut Certification		■											
3. Continue Public and Stakeholder Engagement on Infrastructure Buildout		■	■	■	■	■	■	■	■	■	■	■	■
Infrastructure Planning													
4. Blue Back Square/West Hartford Center				1	■	■	■						
5. Town-Owned Parks								2	■				
6. Town-Owned Schools												3	■
Enabling Funding													
7. Identify Funding Source for Local Match	■	■				■				■			
8. Pursue EverSource Incentives for Town-owned Chargers		■	1			■	2			■	3		
9. Perform Feasibility Assessment of Sites for CFI Grant			■	■									
10. Vendor Meet-and-Greet Forums			■										
11. Develop Procurement for Town-owned Chargers				■	■								
12. Charger Installation						■	■						
13. Develop Procurement for Payment Vendor					■								
14. Payment System Integration						■							
15. Operations, Maintenance, and Performance Monitoring								■	■	■	■	■	→
Enabling Policy and Regulation													
16. Revise Zoning Code to Set Minimum EVSE-Ready Standards	■	■											
17. Set Pricing with Flexibility to Make Future Changes Administratively		■	■										
18. Develop Program to Encourage Installation on Properties in Prioritized Neighborhoods			■	■				■					■
19. Establish Shared Procurement Mechanism				■	■			■	■				■

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