

BEMIDJI SUSTAINABILITY COMMISSION REGULAR MEETING AGENDA

Thursday, July 9, 2026

City Hall – 317 4th Street NW
3:30 PM



1) CALL MEETING TO ORDER

2) APPROVAL OF AGENDA

3) PUBLIC COMMENT

Please state your name and address; please use appropriate language and no derogatory comments towards any individuals; please keep your comments limited to 3 minutes or less; and the chair may limit speakers and times accordingly.

4) OLD BUSINESS

A) Comprehensive Planning Update

B) Strategic Priorities

i) Native Landscaping

ii) Waste & Recycling

iii) Energy Efficiency

a. EV Infrastructure Roadmap

C) Prospective Event — Sustainable Places Tour

5) NEW BUSINESS

D) Commission Leadership

i) Interim Chair from October 2026 to January 2027

E) Reports

i) Planning Cases:

1. Rezone & Concept Planned Unit Development (PUD)

2. Conditional Use Permit (CUP)

F) Article XI SUBDIVISIONS AND PLANNED UNIT DEVELOPMENTS, Sec. 28-471. —
Subdivisions of Land, (f) Tiny House Subdivision

G) Upcoming Events or Grant Opportunities

i) Xerxes Society – [Bee Atlas \(Aug. 8; 10am-Noon; North Country Park\)](#)

6) ADJOURN



Bemidji Electric Vehicle Infrastructure Roadmap

April 2026

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Introduction

The City of Bemidji endeavors to create a city that is healthier, more equitable, and prepared for the challenges of the 21st century. Transportation electrification does exactly that by eliminating one of the largest sources of local emissions; significantly improving public health and building towards city climate goals. As the nation’s transportation system undergoes a rapid transformation, cities are at the vanguard, envisioning and implementing changes to best serve their communities.

This Electric Vehicle (EV) Infrastructure Roadmap outlines critical steps Bemidji can take to ensure infrastructure development keeps pace with EV deployment, using projections of EV adoption over the coming decade to determine future demand for different types of charging infrastructure. By benchmarking existing infrastructure, predicting total demand, and analyzing several important factors for effective and equitable deployment (population density, proximity to existing infrastructure, demographic data, and compatibility with federal regulations), this roadmap provides recommended locations for future charging infrastructure deployment. The recommendations below target equitable access to charging for communities that may experience more difficulty accessing charging infrastructure or installing their own charging due to historical inequities. The City of Bemidji has an opportunity to immediately begin deploying infrastructure and implementing policies to ensure continued infrastructure expansion.

EV Market

The city aims to accelerate EV adoption across multiple transportation sectors and increase the number of light-duty registered electric vehicles by 2030, resulting in a reduction of tailpipe emissions and an improvement in public health.

Projected EV Adoption

To anticipate how consumer EV adoption will grow throughout Bemidji over time, the EC applied modeling done by BNEF in the 2025 Long Term Electric Vehicle Outlook.¹ The modeling projects EV share of new vehicle sales through 2030. EVs made up roughly 10% of new vehicle sales in 2025 and are expected to continue to increase in the years following. Aggregate vehicle data gives the forecasted number of registered vehicles in Bemidji and surrounding areas through 2030, focusing on Beltrami County as a whole. Based on projected increases in EV share of new vehicles sold, the number of EVs registered in Beltrami County is expected to reach roughly 328 by 2030. This implies the charging needs in the subsequent years. There are currently 159 EVs registered in Beltrami County.²

Table 1. Projected electric vehicle growth in Beltrami County (PHEV and BEV), 2026-2030³

	2026	2027	2028	2029	2030
Estimated EV share of new vehicle sales	12%	15%	18%	23%	27%
Estimated total number of EVs registered in Beltrami County	234	253	272	303	328

¹ Long Term Electric Vehicle Outlook, RMI and BNEF, 2025, <https://rmi.org/electric-vehicles-are-on-the-road-to-mass-adoption/>

² EValueMN, Atlas Public Policy, updated October 8, 2025, <https://atlaspolicy.com/evaluatemn/>

³ Long Term Electric Vehicle Outlook, RMI and BNEF, 2025, <https://rmi.org/electric-vehicles-are-on-the-road-to-mass-adoption/>

³ EValueMN, Atlas Public Policy, updated October 8, 2025, <https://atlaspolicy.com/evaluatemn/>

State of EV Charging

Accounting for the number, type, and location of existing electric vehicle supply equipment (EVSE) is important to develop the next phase of EVSE installations based on projected EV registration increases.

Light-Duty EV Charging Overview

The charging industry has aligned on common terminology for charging stations: station location, EVSE port, and connector (Figure 1). Definitions for these terms include:

Station Location: A station location is a site with one or more EVSE ports at the same address. Examples include a parking garage or a mall parking lot.

EVSE Port: An EVSE port provides power to charge only one vehicle at a time even though it may have multiple connectors. The unit that houses EVSE ports is sometimes called a charging post, which can have one or more EVSE ports.

Connector: A connector is what is plugged into a vehicle to charge it. Multiple connectors and connector types (such as NACS, CHAdeMO and CCS) can be available on one EVSE port, but only one vehicle will charge at a time.⁴

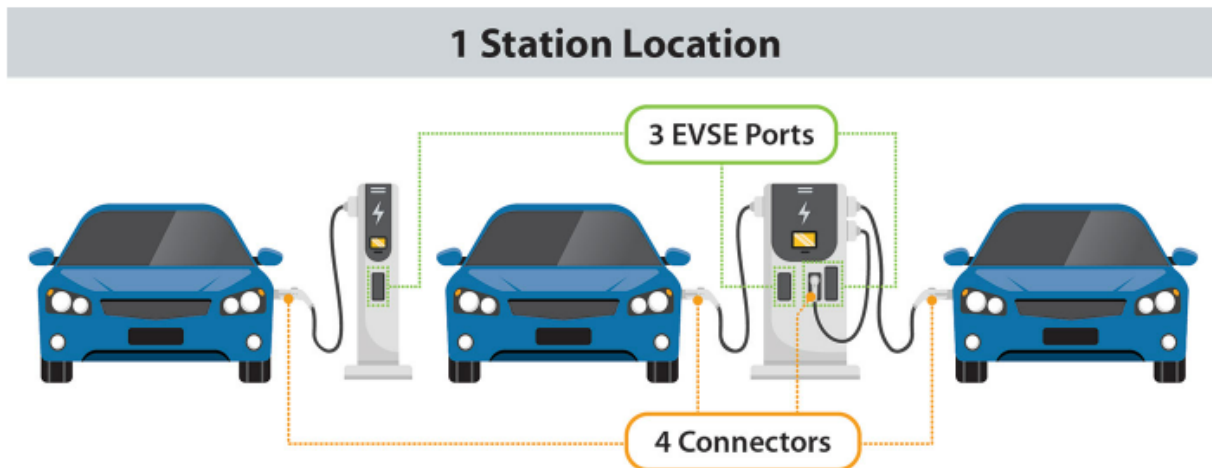


Figure 1. EVSE Charging Station Diagram

Charging equipment for EVs is available at different levels based on the rate the battery is charged. The time needed to fully charge an EV will vary based on the size of the battery, how depleted the battery is, and the electric current of the EV charging equipment.

⁴ Alternative Fuels Data Center. https://afdc.energy.gov/fuels/electricity_infrastructure.html.

Light-duty EV drivers have the flexibility to charge at a variety of locations, including homes (single-family and multi-family), workplaces, shopping centers, restaurants, and fleet parking facilities. Figure 2 and Table 2 provide an overview of EV charging levels, including the amount of range each level provides an EV, the charging ports used, and typical applications.

Level 1 chargers use standard 120V outlets. 120V circuits are also used by most home electronics. 1 hour = 5 miles.

Level 2 chargers use 240V circuits. 240V circuits are also used by dryers and stovetops. 1 hour = 25 miles.

Direct Current (DC) Fast Chargers use 480V circuits at public charging stations. 10 minutes = 40 miles.



Figure 2. EVSEs

Table 2. EV Charging Characteristics

	Level 1	Level 2	Direct Current
Connector Types	J1772, NACS	J1772, NACS	CCS Combo, NACS
Typical Applications	Residential, Workplace, Fleet	Residential, Workplace, Fleet, Public	Fleet, Public

Most EV charging today (approximately 80%) occurs at home. However, higher adoption rates will reduce that percent as more multi-unit dwelling (MUD) residents go electric. The deployment of charging infrastructure at MUDs presents additional challenges such as unreliable access to parking, and complexities related to billing, establishing a sufficient power supply, and EVSE ownership. Workplace charging is another opportunity for the city and local employers to satiate demand, as workplace charging helps increase the convenience of driving electric for employees while increasing charging during off-peak hours. Similarly, access to public charging is critical in decreasing range anxiety and increasing the convenience of driving EVs in the city. For all charging applications, dwell time (the amount of time a vehicle is typically parked) should be considered when determining what charging level to install.

Existing Public EV Charging Infrastructure

Across the city, there are nine public charging stations (Figure 3). As of April 2026, there are nine Level 2 ports and 16 direct current fast charging (DCFC) ports (Table 3). DCFC chargers operate at a higher voltage (480V, three-phase DC), allowing faster charging speeds than the slower 240V Level 2 charging connection.⁵

Table 3. Operational public EV charging stations and connectors in Bemidji, March 2026

Charging Type	Number of Station Locations	Number of Ports
Level 2	7	9
DCFC	5	16

Currently, about half of the publicly available Level 2 chargers in Beltrami County are in Bemidji, and all available DC fast chargers in the county are located in Bemidji as well. It is essential to deploy charging stations equitably so that all communities and residents have ready access to chargers, as charging access is a crucial component of EV ownership. Publicly accessible EV charging both supports current EV owners and encourages the adoption of EVs for those who may be unable to install EVSE at home.

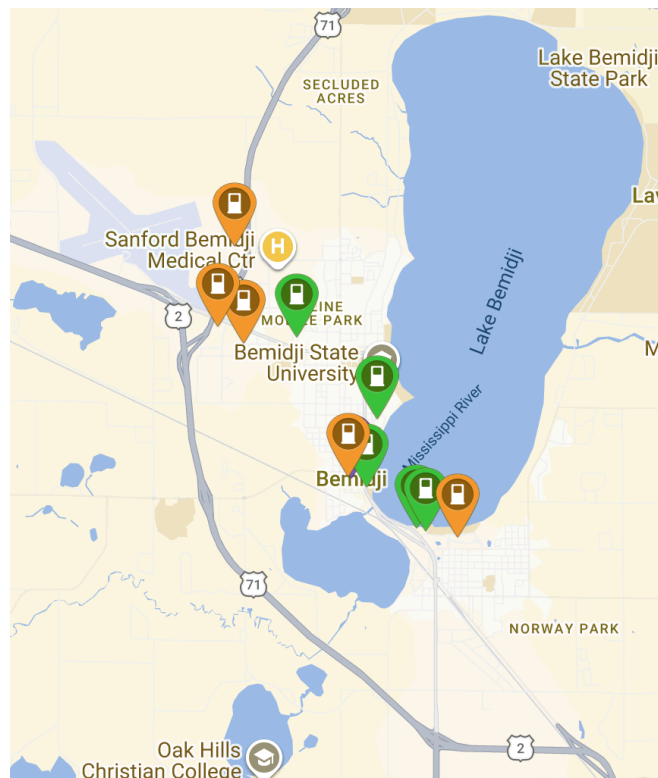


Figure 3. Locations of current public EV charging stations in Bemidji, April 2026 (orange indicates DCFC; green Level 2)

⁵ DOE Alternative Fuels Data Center Station Finder.

<https://afdc.energy.gov/stations#/find/nearest?location=Bemidji,+mn&fuel=ELEC&page=1>. PlugShare.
<https://www.plugshare.com/>.

Analysis of Charging Stations Needed to Meet Growing Demand

The EC utilized projections of future charging station needs using the Electric Vehicle Infrastructure Projection Tool (EVI-Pro Lite), forecasting amount of charging infrastructure required at metropolitan-level across Bemidji to meet current and future charging needs.⁶ The inputs assumed 25% share of PHEVs compared to 75% EVs.

By 2030, if there are 328 plug-in electric vehicles (EVs and PHEVs) in Beltrami County using the local public charging infrastructure, the city would need a total of 17 public Level 2 ports and four public DCFC ports while the rest of the county would need 16 public Level 2 ports and three DCFC ports for a total of 19 ports. These forecasted estimates can be met through both public and private investment in the region.

As Bemidji currently hosts nine public Level 2 ports and 15 public DCFC ports, the focus should be on installing seven additional public Level 2 ports by 2030, though the city could also assume that the 11 additional DCFC ports (over the projected four required) supplement the existing Level 2 chargers, lessening the need for investment in public Level 2 charging. Therefore, Bemidji could instead focus on supporting the rest of the county in EV charging installation.

⁶ Electric Vehicle Infrastructure Projection Tool (EVI-Pro Lite). <https://afdc.energy.gov/evi-pro-lite>.

EV Charging Location Suitability Modeling

Choosing site locations for EV charging stations requires consideration of physical and electrical requirements, ensuring ease-of-use and access for various user groups, such as residents, commuters, and visitors. To determine current areas for prioritizing EV charging installations, modeling was conducted using Argonne National Laboratory's Geospatial Energy Mapper (GEM). The methodology and details for each of the identified parameters are described in Appendix A. For clearer images, please visit the GEM webpage while using Appendix A and the models as replication references.⁷

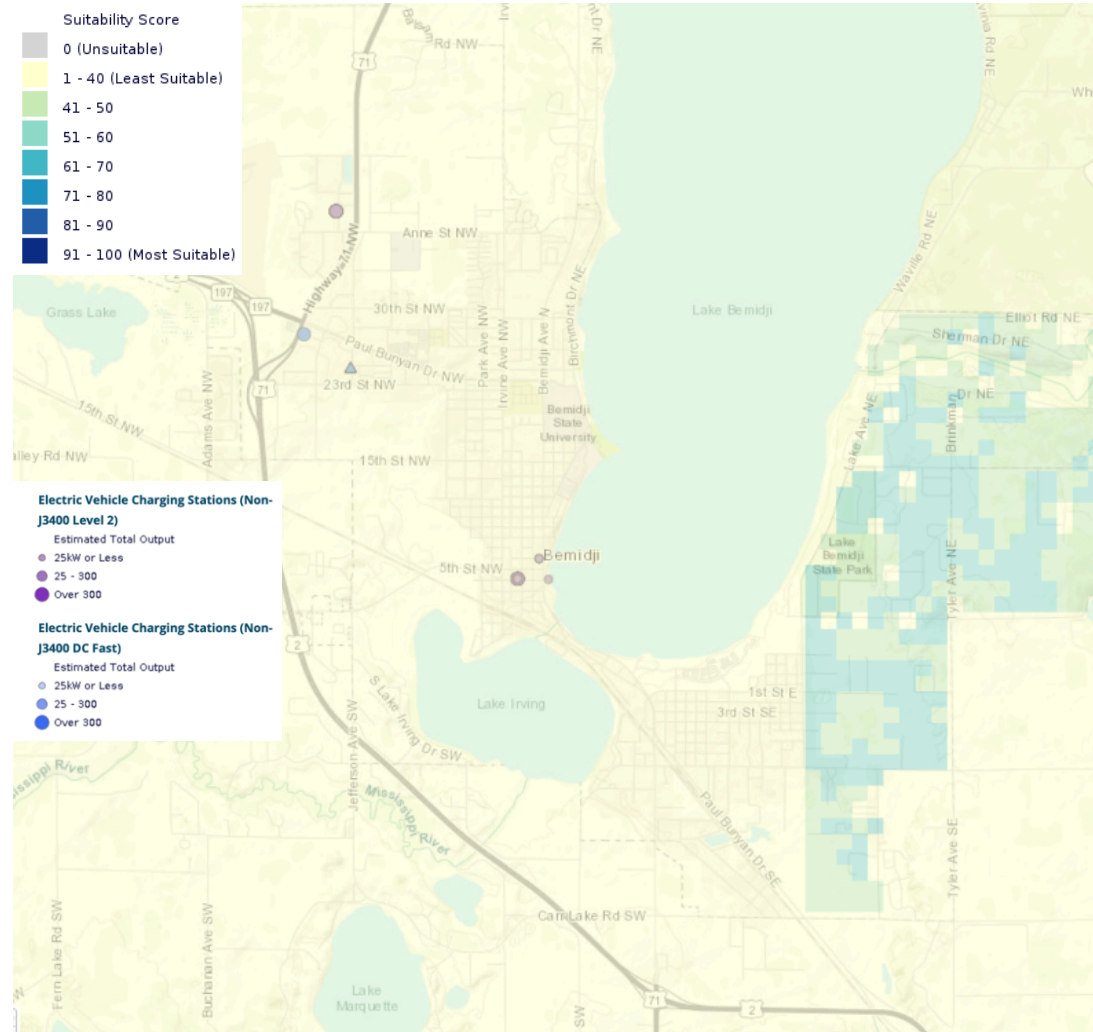
The following maps illustrate a snapshot of EVSE suitability based on the parameters listed below and the weight (or influence) assigned to each.

- Model 1 focuses on higher population density areas, locations where multi-family dwellings exist, and where EVSE is not currently installed. Areas with darker blue shading (i.e., 60 to 100 suitability) indicate a more suitable location for EVSE to be installed.
- Model 2 focuses on demographic information and transit access to determine the suitability for EVSE installations. There are distinct areas on the map illustrating where EVSE installations should be first prioritized to address needs based on these parameters.

⁷ The Geospatial Energy Mapper. <https://gem.anl.gov/>.

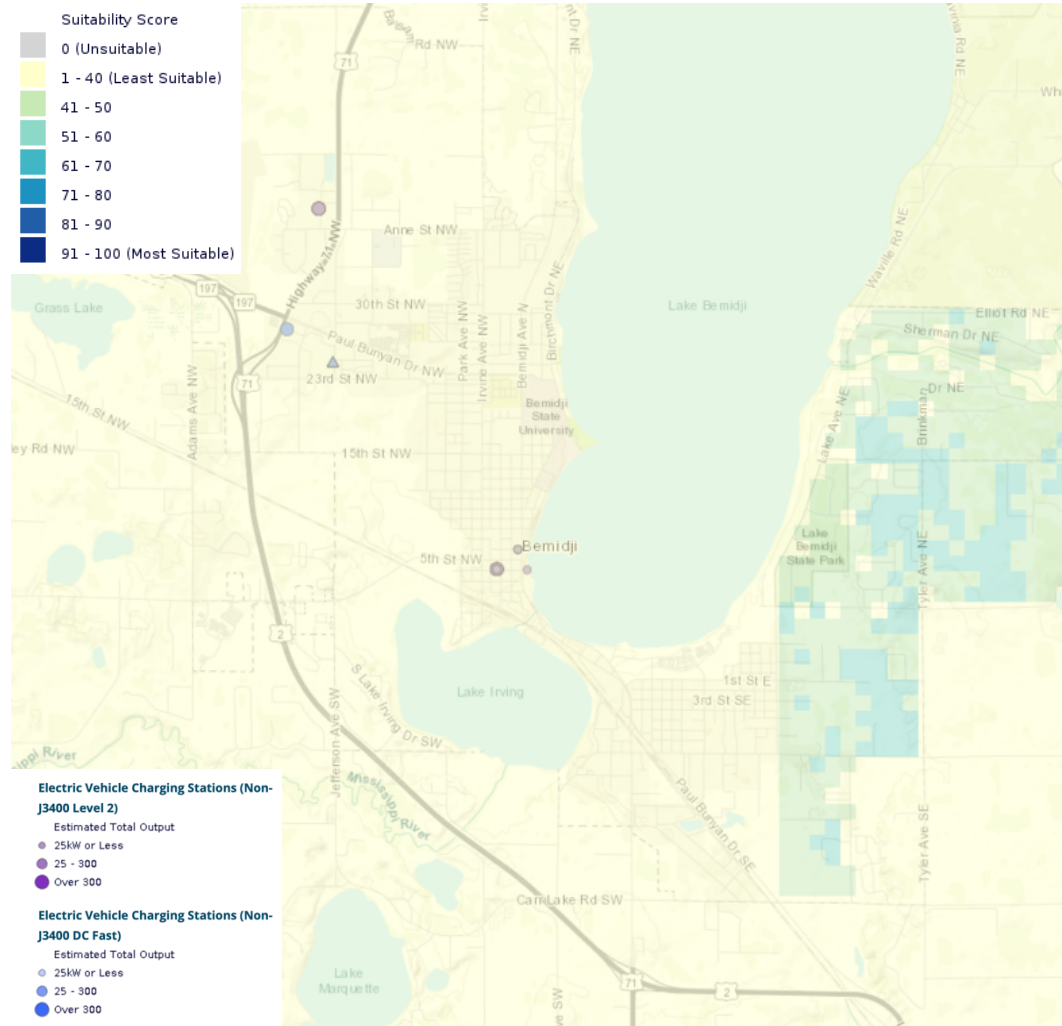
Model 1: Population and Housing

This model focuses on population-dense areas, locations where multi-family dwellings exist, and where no EVSE is currently installed. Areas with darker shading indicate a more suitable location for installing EVSE. As shown in the model, areas along the east side of town are more suitable for EV charging, including those with higher population density. Based on this model, the city locations most suitable for EV charging deployment would be: along the snowmobile trail, Brinkman Park, East Lake Bemidji Park Preserve, Otto Schmunk Park, and Nymore Park.



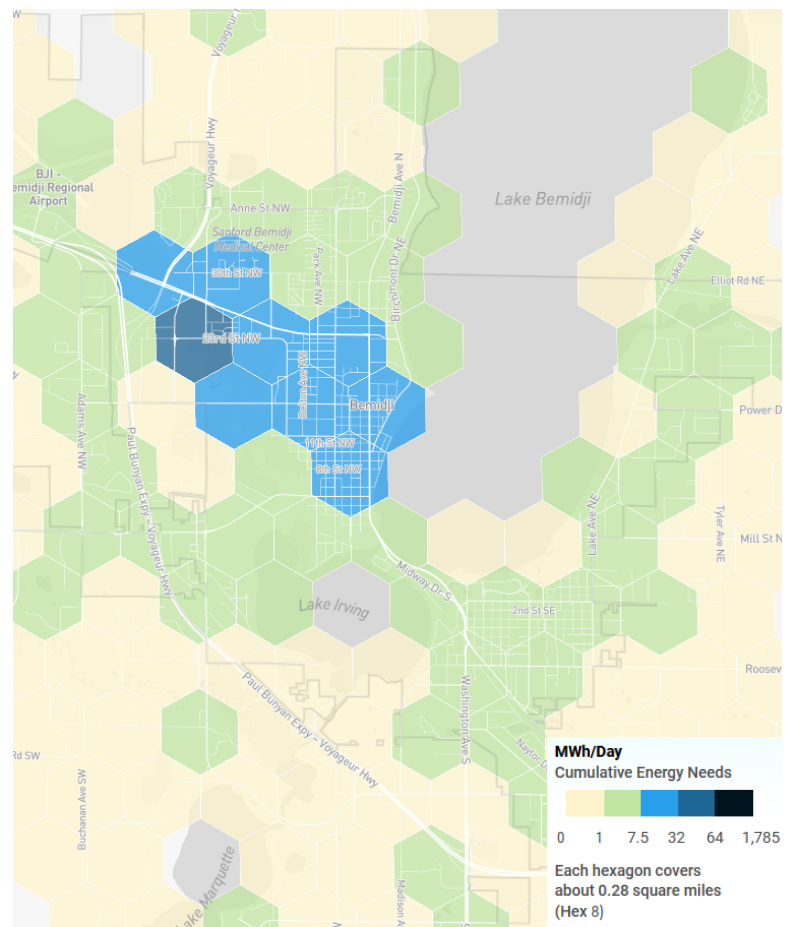
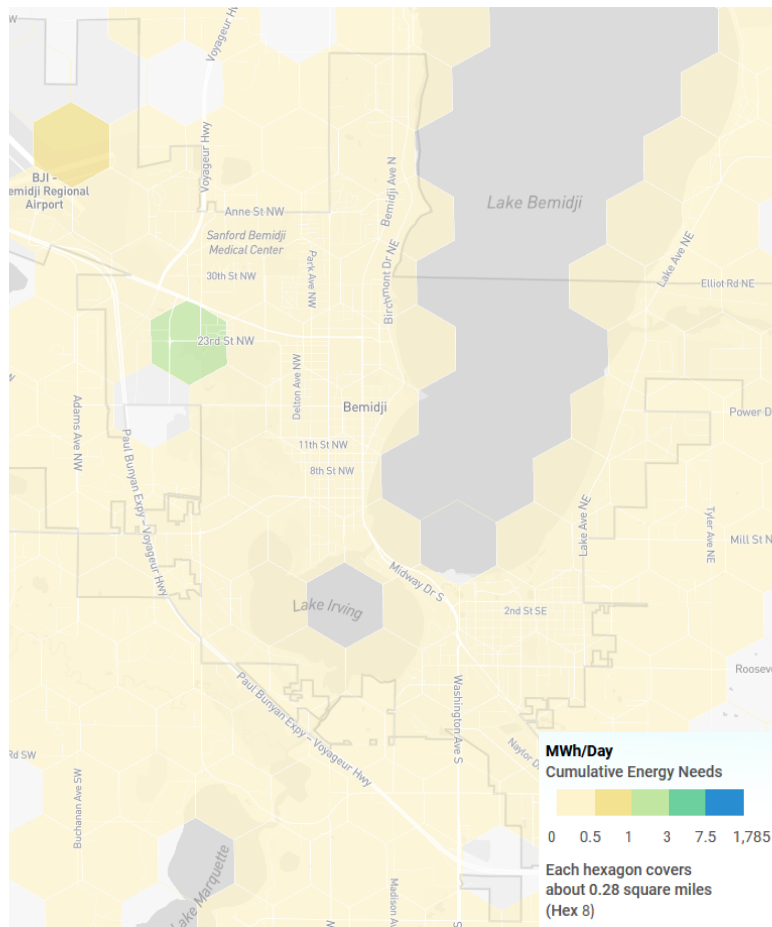
Model 2: EV Infrastructure and Demographics

In Model 2, parameters important for installing EV infrastructure have been added to the demographic data. When comparing Model 1 and Model 2, overlapping areas indicate high-suitability areas where EVSE should be prioritized. This highlights historically disadvantaged communities and how their distance from existing EVSE buildout affects access. Paired with the local density of EVSE, this model identifies priority locations for EVSE installation based on proximity to substations (i.e., potential buildout of EVSE) and the distance between charging stations. Similar to Model 1, this model shows areas along the east side of town as the most suitable for EV charging installation. Based on this model, the city locations most suitable for EV charging deployment would be: along the snowmobile trail, Brinkman Park, East Lake Bemidji Park Preserve, Otto Schmunk Park, and Nymore Park.



Future Grid Demand Considerations

Preparing for future grid demand is critical in every electrification roadmap. The eRoadMap provides a visualization of the highest potential energy demand if all transportation was electrified.⁸ The maps shown below provide near-term estimates of electricity demand for 2030 in Bemidji at current transportation electrification pace (left), versus full electrification (right). These maps can be utilized during initial conversations with the local electric utility about preparing for future electrification needs.



⁸ eRoadMAP™. <https://eroadmap.epri.com/>

2026 Fleet Analysis

Fleet Summary

Overall, there are 46 light-duty vehicles in Bemidji's fleet, making up 41.82 percent of the fleet. Medium-duty vehicles make up 40 percent of the fleet (44 vehicles). Heavy-duty vehicles make up 18.18 percent of the fleet (20 vehicles).

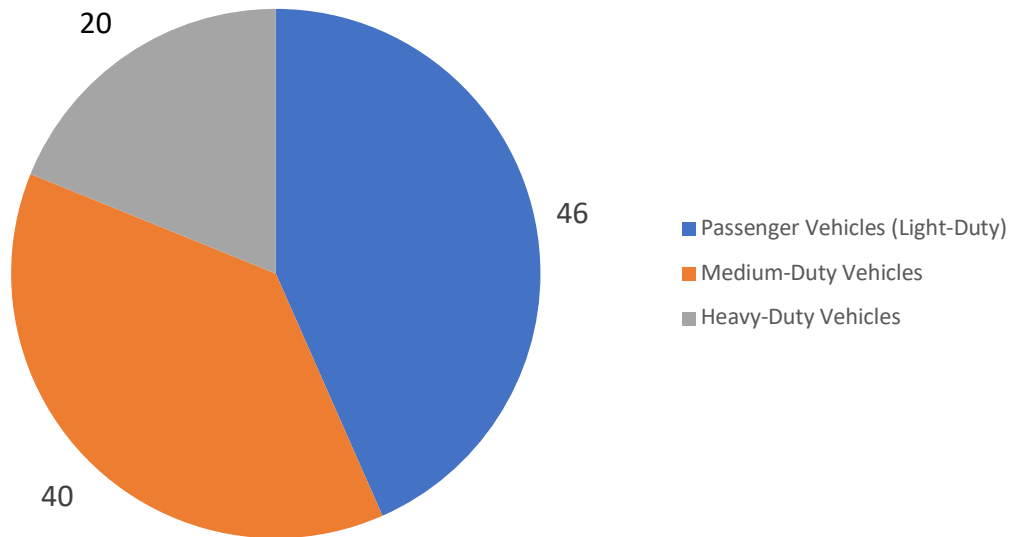


Figure 4: Bemidji Fleet Makeup

TCO Analysis

This analysis was conducted using a total cost of ownership (TCO) approach to project the cost of all vehicles over their expected useful lives. TCO includes vehicle purchase price, operating, and maintenance costs over the life of the vehicle, as well as charging infrastructure cost, if selected. To estimate each vehicle's value, the analysis uses its depreciated value at the end of its useful life. Annual depreciation is calculated using the purchase price, range, and annual mileage for each vehicle, relying on a formula developed using real world used vehicle sales data. The analysis includes a calculation of the net present value (NPV) of 100 percent electrification compared to 100 percent conventional vehicle use. This takes the NPV of the TCO of all vehicles across the fleet by vehicle class.

Fleet Analysis

The charts below show the average total cost of ownership per mile across each vehicle's useful life. Figure 5 shows the average across each vehicle category, while Figures 6 and 7 show the average across use cases for passenger vehicles and medium/heavy-duty vehicles. Table 4 shows the average cost per mile per use case.

Figure 5. Average Cost per Mile per Vehicle Category

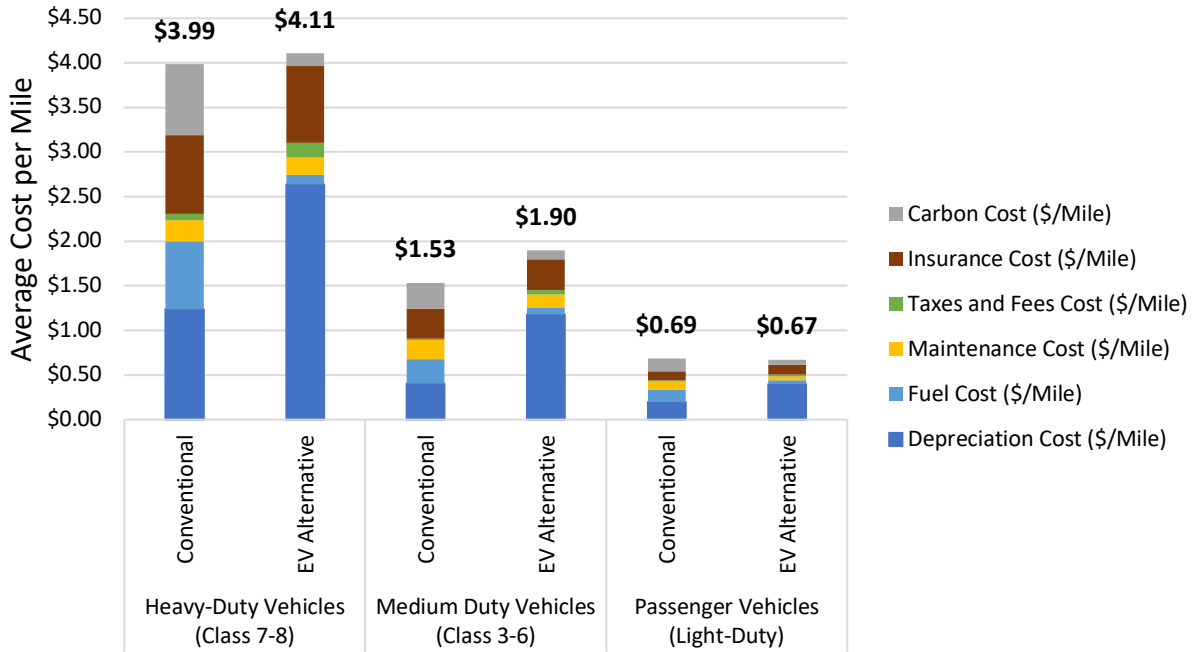


Figure 6. Light-Duty Nominal Cost per Mile per Vehicle Use Case

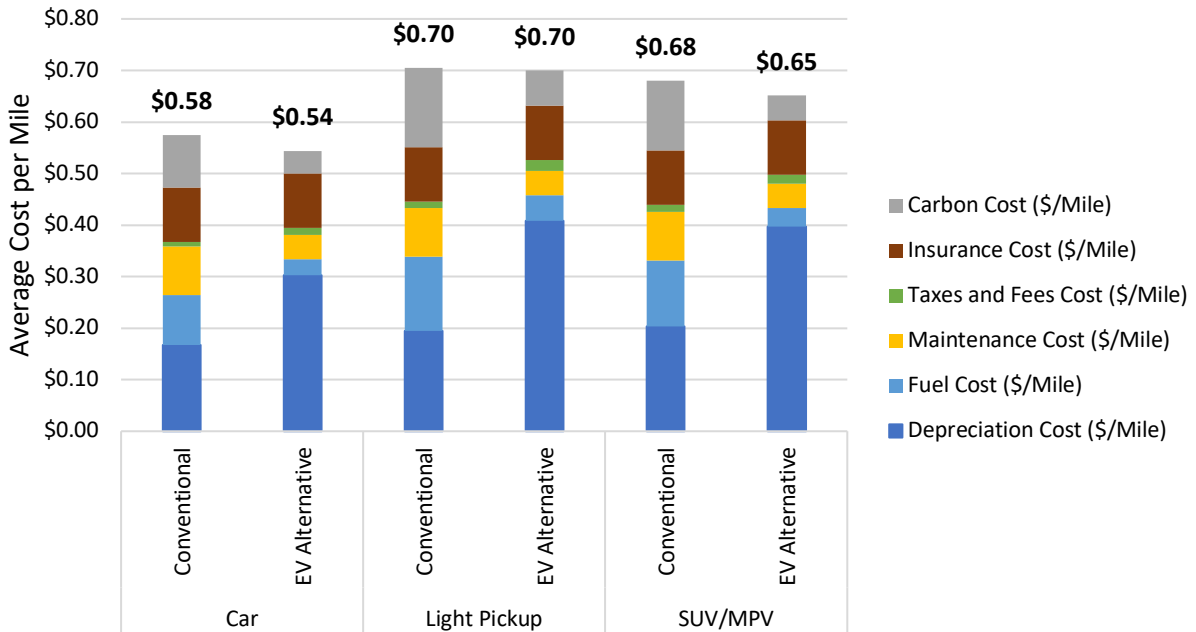


Figure 7. Medium- & Heavy-Duty Nominal Cost per Mile per Vehicle Use Case

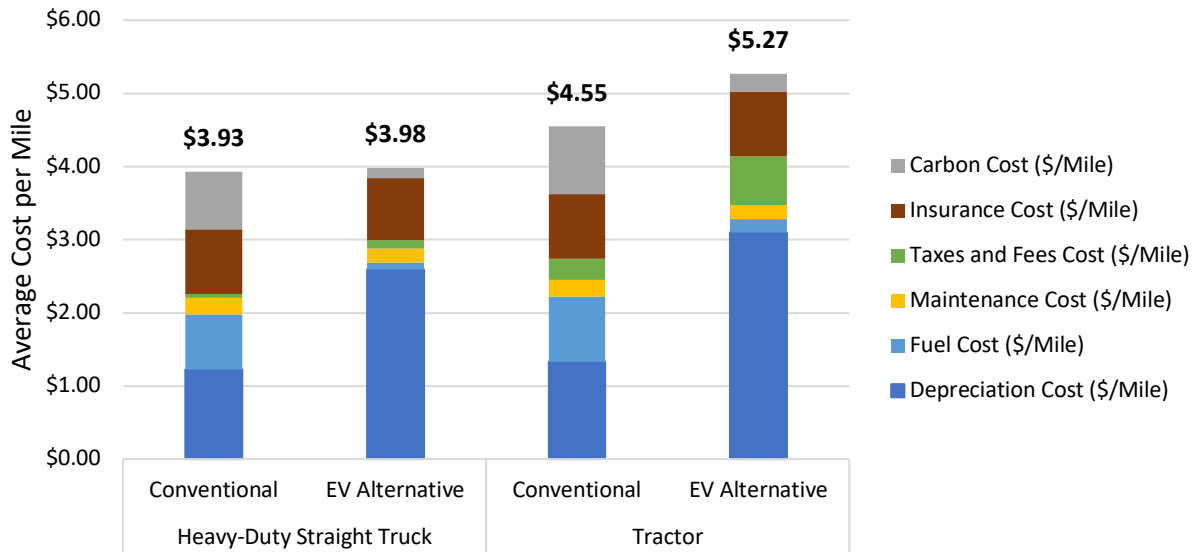


Table 4. Average Cost per Mile (CPM) per Use Case

Vehicle type	Original CPM	EV Average CPM
Car	\$0.56	\$0.55
Cargo Van	\$1.51	\$1.06
Heavy-Duty Straight Truck	\$3.79	\$4.02
Light Pickup	\$0.69	\$0.72
Medium-Duty Pickup	\$1.28	\$1.78
Medium-Duty Straight Truck	\$2.29	\$2.60
Step Van	\$2.76	\$2.94
SUV/MPV	\$0.68	\$0.66
Tractor	\$4.40	\$5.32

Replacement Vehicles

Of all the replacement options, the models shown in Table 5 were found to be the most cost-effective replacement vehicles compared to conventional alternatives. Appendix B shows all vehicles in the fleet, a suggested EV replacement, and the cost savings associated with each.

Table 5. Vehicle Replacements

Current Fleet Vehicle	Avg. Percent Savings from EVs	Suggested EV Alternative	No. of Vehicles in Fleet
Ford Edge	22.21%	2026 Volkswagen ID.4 BEV Electric	1
Nissan Armada	19.19%	2026 Chevrolet Equinox EV FWD BEV Electric	1
GMC Terrain	19.19%	2026 Chevrolet Equinox EV FWD BEV Electric	1
Chevrolet Tahoe	18.61%	2026 Kia EV9 Standard Range RWD BEV Electric	3

Fleet Electrification

Local governments across the United States are leading by example in the transition to EVs, incorporating EVs into their fleets, from parks and recreation departments to police and beyond.

If Bemidji proceeds with fleet electrification as outlined in the DRVE analysis, the city can expect to see **\$169,420** in lifetime savings.

Benefits of Fleet Electrification

There are many benefits to incorporating EVs into city fleets. EVs are cheaper to own and maintain, with less maintenance needed and electricity being cheaper and less prone to price shocks than gas and diesel. As EVs have no tailpipe emissions, there will eventually be no need for carbon monoxide monitors in fleet garages. EVs result in better air quality for the city staff that work with the vehicles as well as members of the community who live, work, and play in areas frequented by city fleet EVs. Finally, as Bemidji works to become a more sustainable city, EVs can help reduce overall carbon emissions, as EVs have far fewer lifetime carbon emissions than gas and diesel vehicles, even when accounting for emissions during manufacturing.

EV-First Procurement Policies

Many cities have implemented EV-first procurement policies, which stipulate that new vehicle purchases made by city affiliates must be EVs unless a waiver is obtained based on high cost or other substantive reasons.⁹ Specifically, many such policies require any replacement vehicle to be an EV if a suitable model is available for the given application and the EV's total cost of ownership (TCO) comes within a certain margin of a comparable conventional vehicle's TCO.¹⁰ A general EV-first procurement policy tends to allow for a plug-in hybrid electric vehicle (PHEV) if

⁹ Electrifying Transportation in Municipalities. Electrification Coalition. <https://electrificationcoalition.org/electrifying-municipalities/#Fleets>.

¹⁰ State Plug-in Adoption Resource Kit. Electrification Coalition. <https://electrificationcoalition.org/spark/develop-ev-procurement-and-operation-policies/>.

the EV option has a higher TCO and/or it cannot fulfill the use case. If the PHEV won't work, then the policy requires a conventional hybrid, and finally, if all else fails, allows for a gas/diesel vehicle.

EV Charging Policy Recommendations and Equity Considerations

Local governments across the United States have proven to be effective leaders in the transition to EVs, implementing policies to spur electrification faster than their respective states and the nation as a whole.

Policies and Mechanisms Toward EV Readiness

In preparation for an EV community, EV readiness ordinances are among the most cost-effective policies the city can implement. EV readiness ordinances, sometimes referred to as “dig once” policies, require new buildings to be pre-wired for EV charging and typically include building codes, zoning laws, parking ordinances, and other components. Adopting a vision for EV-ready buildings has significant equity benefits, as the EV-ready building codes can be applied to multi-unit dwellings, which often house low- and moderate-income populations. The adoption of EV-ready building codes also sets the stage for the creation of jobs installing charging stations.

The city can adopt codes requiring new construction and sizable renovations to be EV-capable, EV-ready, and/or EVSE-equipped. Codes may vary by building type; fully operational installed charging equipment may be required in a new commercial space, while EV-ready wiring for a Level 2 charger may be required for a new residential duplex. Building codes can include different levels of EV-ready, EV-capable, and EVSE installation requirements for different scales of renovation on existing buildings (Figure 8).

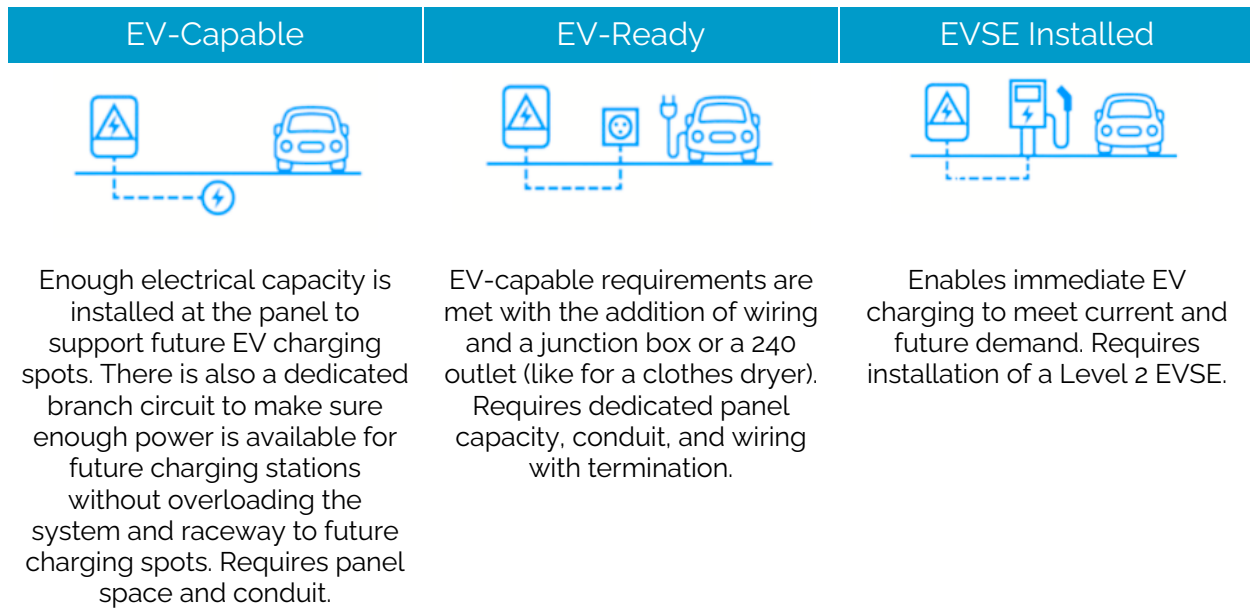


Figure 8. Definitions of EV Readiness

Cities are paving the way for EVs by allowing, incentivizing, and even requiring EVSE infrastructure in their communities. While there is no "ideal" or one-size-fits-all deployment strategy, zoning, codes (including permitting), and parking ordinances are three particularly powerful and cost-effective tools to encourage EV and EVSE adoption.

While the process to develop an EV-readiness policy varies by location, some cities have found success through initial stakeholder engagement, resulting in a new building energy benchmark requirement, then moving to solicit feedback from community members to fine-tune the policy before passing the final ordinance.

Zoning, building codes, and parking ordinances can be implemented individually or in combination with one another. Below is a description of different policy tools and examples from cities putting them into practice.

Building Codes

Codes and standards are intended to work in combination to create a framework of safety requirements and best practices. While there are numerous aspects of EV readiness standardized by codes, the most common are model codes for the construction and electrical equipment installation procedures associated with EVSE.

Washington, D.C. requires new buildings or developments with major renovations with three or more off-street parking spaces to accommodate EVSE.¹¹

Ann Arbor, Michigan requires all new buildings and existing building renovations to include EV Charging Infrastructure (February 2021). Rules include minimum EV parking percentages (10-100%) according to building type.¹²

St. Louis, Missouri adopted EV-ready building regulations in 2021 that took effect in 2022 and apply to new construction and any major renovations of multi-family or commercial buildings. Starting in 2024, single-family units undergoing major renovations will also be subject to these policies.¹³

Parking Requirements

Parking ordinances apply to publicly accessible EVSE, whether at municipal lots, privately operated garages, or on-street locations.

Kansas City, Missouri enforces EV-only charging spaces. EV parking spaces in off-street parking facilities may be counted toward the off-street parking space requirements.¹⁴

¹¹ Washington, DC. Building Code. <https://code.dccouncil.us/us/dc/council/code/sections/6-1451.03a>.

¹² Ann Arbor, Michigan. Building Ordinance, <https://www.a2gov.org/departments/city-clerk/Documents/ORD-20-35%20Approval%20notice.pdf>.

¹³ St. Louis, Missouri. Mayor Krewson Signs Transformative Electric Vehicle Ordinances into Law, <https://www.stlouis-mo.gov/government/departments/mayor/news/electric-vehicle-2021.cfm>

¹⁴ Kansas City, Missouri. Parking Requirements. http://kansascity-mo.elaws.us/code/zadc_400series_88-420_sec88-420-04.

Zoning Ordinances

Zoning ordinances govern the use of property within a jurisdiction. For EV readiness, zoning ordinances are useful tools for state and local governments to indicate where EVSE is allowed or prohibited.

Vancouver, British Columbia requires 100% of parking spaces in multi-family homes to be EV-capable. The ordinance guarantees 12kWh ≥8 hours through a Level 2 (208/240V) circuit for every parking stall.¹⁵

Auburn Hills, Michigan amended zoning ordinances to incorporate Electric Vehicle Infrastructure and strongly urge all new residences with garages to be constructed with a 40-amp outlet on a dedicated circuit near future EVSE.¹⁶

Atlanta, Georgia adopted an ordinance in 2017 requiring all new single-family home parking, 20% of new commercial parking, and 20% of new multi-family residential parking to be EV-ready.¹⁷ Atlanta subsequently adopted an updated version of the code in 2025 that builds on the 2017 ordinance to additionally require 20% of new commercial parking and 20% of new multi-family residential parking to be EVSE-installed.¹⁸

Policy Options to Develop Equitable Charging

Planning for the build-out of charging infrastructure is critical for a just and equitable transition to transportation electrification. Equitable charging means ensuring EV charging infrastructure is installed in a way that addresses a spectrum of needs. Examples include planning for, requiring, and/or installing charging infrastructure at workplaces and businesses, in the public right-of-way, at multi-unit dwellings, and across neighborhoods. Charging at MUDs is especially important to improving equitable access.

¹⁵ Vancouver, British Columbia. Zoning Ordinance.

https://bylaws.vancouver.ca/parking/Sec04.pdf?_ga=2.205842971.980987902.1581622488-1487957635.1537562134.

¹⁶ Auburn Hills, Michigan. Electric Vehicle Infrastructure Zoning Ordinance.

https://files4.1.revize.com/auburnhills/document_center/2_AH_EV_Infrastructure_Ord.pdf.

¹⁷ Atlanta, Georgia. City of Atlanta Passes “EV Ready” Ordinance into Law.

<https://www.atlantaga.gov/Home/Components/News/News/10258/#:~:text=The%20ordinance%20requires%2020%20percent,conduit%2C%20wiring%20and%20electrical%20capacity.>

¹⁸ Atlanta, Georgia. The 2025 City of Atlanta EV Readiness Workbook.

<https://static1.squarespace.com/static/5f91d62189677674f6d02ab6/t/691f719f05492313ced6c377/1763668383908/2025+Atlanta+EV+Readiness+Workbook.pdf>.

Equitable EV-Readiness Ordinances

Columbus, Ohio passed an Equitable EV Readiness Ordinance that creates an explicit requirement/consideration for affordable housing to expand charging in underserved communities.¹⁹ It creates requirements/considerations for single-family homes, multi-unit dwellings, workplaces, commercial buildings, and City of Columbus parking, allowing better applicability to various building type needs. It has a ramp-up of requirements to 2028.

Multi-Family Housing Charging Policy Resources

The Urban Sustainability Directors Network (USDN) developed a guide for communities to help residential tenants access charging.²⁰ Renters are often unable to charge at home because of a lack of off-street parking, inability to afford charging installation, or a property owner's unwillingness to install the equipment.

The ACEEE published a white paper in April 2021 summarizing challenges for EVSE investment (including parking availability, multi-unit dwellings, permitting, and multiple transport modes), the role of utilities (e.g., ratepayer funds dedicated to equitable outcomes, working with transit and school buses), current utility activities and investment focused on equitable EVSE (especially in Arizona, California, Colorado, New Mexico, and Oregon, who are prioritizing multi-unit dwellings and school and transit buses), and community engagement and metrics (community needs assessment, mobility equity analysis, and placing decision making in the hands of the local community).²¹

Stakeholder Engagement

Collaboration among diverse stakeholders is important to pass the policies needed to advance transportation electrification. Community members in areas that have disproportionately borne the adverse impacts of transportation emissions should be consulted when planning EVSE locations. By strategically coordinating with other local educational or training efforts, EV adoption can help overcome barriers to inclusion that typically inhibit

¹⁹ Columbus, Ohio. EV Readiness Ordinance.

<https://www.columbus.gov/sustainable/evreadyparking/#:~:text=Draft%20EV%20Ready%20Parking%20Ordinance,2022%20to%20May%2025%2C%202022.>

²⁰ USDN. Electric Vehicle Charging Access for Renters: A Guide to Questions, Strategies, and Possible Next Steps. https://www.usdn.org/uploads/cms/documents/usdn_evchargingaccess_updatedreport_final_11.18.20.pdf.

²¹ ACEEE. Siting Electric Vehicle Supply Equipment (EVSE) with Equity In Mind. https://www.aceee.org/sites/default/files/pdfs/siting_evse_with_equity_final_3-30-21.pdf.

residents from under-resourced backgrounds and communities from participating in the clean energy economy, and ensure the city avoids furthering existing health and economic inequalities.

The City of Columbus' approach offers best practices and lessons learned for a stakeholder plan in Bemidji. During the development of the City of Columbus' Equitable EV Readiness Ordinance, a series of stakeholder sessions were held to gather input and incorporate feedback in the drafted EV readiness policy.

The City of Bemidji can use maps and indexes to determine which communities to engage. Ensure that engagement materials and meetings are accessible to all members of the community by providing non-English language options aligned with local demographics.

EVSE Revenue Models

EVSE offers site hosts a potential revenue stream to offset or displace the cost of operating and maintaining the charger. There are multiple avenues for collecting revenue.

A site host can receive payment from an EV driver charging their vehicle, or a site host can contract with a third party that integrates advertisements into the charger and share in the revenue from entities paying to display advertisements.

Additionally, local governments can explore leasing public land to charging station providers at government properties. Public-private partnerships are beneficial to all parties; local governments gain EVSE throughout the county while providers have access to a larger customer base and new markets.

To hold third party providers accountable for charger maintenance and operability, the city can incorporate uptime requirements, or the amount of time a charger is operational and able to provide EV charging, into contracts with EVSE service providers. Typically, 97% uptime is an industry-accepted requirement, with federal programs such as the National Electric Vehicle Infrastructure (NEVI) program requiring this threshold.²²

Efficiency Maine²³ provided sample language for including the 97% uptime requirement into a contract, along with a requirement to minimize consecutive downtime hours:

- a. Minimum Uptime. Recipients must ensure that each charging port has an average annual uptime of greater than 97%.
 1. A charging port is considered "up" when its hardware and software are both online and available for use, or in use, and the charging port successfully dispenses electricity in accordance with requirements for minimum power level (see Section 680.106(d) of the NEVI Standards).
 2. Charging port uptime must be calculated on a monthly basis for the previous 12 months using the methodology described in Section 680.116(b) of the NEVI Standards.
- b. In addition to the minimum uptime requirement defined above, the Recipient must ensure that downtime for each individual charging port does not exceed 72 consecutive hours. It is the Recipient's responsibility to ensure the 97% uptime requirement is met for each individual charging port and that interruptions are remedied within 72 hours. For any interruption in service to any DCFC that has lasted or is expected to last more than four (4) hours:
 - i. Notify appropriate information sources including, but not limited to, website and

²² 23 CFR 680.116(b). [https://www.ecfr.gov/current/title-23/part-680/section-680.116#p-680.116\(b\)](https://www.ecfr.gov/current/title-23/part-680/section-680.116#p-680.116(b)).

²³ Sample Contract for EV Charging Stations Using NEVI. Efficiency Maine. https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://www.energymaine.com/docs/Attachment-B_EMT-Sample-Contract-for-EV-Charging-Stations-Using-NEVI-Funds-Phase-6_UPDATED_2023-11-08.docx&ved=2ahUKewjS0NWU8JiTAXEOzQIHxN8PagQFnoECBkQAQ&usg=AOvVaw134ux4WKqGOokdBsYcMkK8.

- application hosts, as appropriate so drivers are aware of the interruption; and
- ii. Inform the Trust via email within one business day to give the Trust notice of the event and when it started and to explain the cause of the interruption and the plan for and estimated time needed to restore service.

Equitable Access to EVs

To enable equitable access to EVs and encourage higher EV adoption rates, consider exploring reduced-cost or income-based EV car sharing programs. Car shares remove barriers to EV adoption by allowing participants to experience EVs without the cost of ownership. These programs offer economic and environmental benefits while fostering EV awareness.

Saint Paul and Minneapolis, Minnesota established the EV Spot Network, a series of 70 EV charging locations that grant access to Evie – a carshare service that provides an income-based plan for those who qualify. This initiative aims to make EVs more accessible and affordable for a broader range of residents, and to promote sustainable transportation practices in the community.²⁴

Utility Funding Opportunities & Engagement

The City of Bemidji's primary electric utility, Otter Tail Power Company,²⁵ offers a \$500 rebate to customers who install a Level 2 charger. The company also offers reduced electricity rate, the Drive On Electric Vehicle Rate, to customers who have EVs.

Utilities are an important partner in promoting widespread EV adoption, particularly at the local level. Engaging with utilities throughout the planning process for EV and EV infrastructure deployment can be a productive way to ensure long-term alignment of priorities. In discussions with utilities, there are several factors that can be helpful to keep in mind.

1. **Eliminate Unnecessary Barriers to Program Entry:** Request that utilities be clear on simple details needed to initiate applications and be willing to work with applicants on the buildout of the application process. For instance, requiring site-specific designs can create a barrier to entry for site hosts who do not have engineering/facility management on staff; instead, these types of designs could be developed through the application process, rather than be required to initiate an application.
2. **Provide Funding for Other Project Components:** Come to the table with utilities with the expectation that future funding sources must be discussed, above and beyond simply discussing the funding needed for infrastructure alone. Ensuring funding is available for make-ready and other project costs can result in easier deployment overall. To that point, it is also ideal to provide funding for up to five years of network subscription and maintenance costs to ensure reliable operation and maintenance of charging infrastructure.
3. **Require Uptime Minimums for Reliable Operation:** Establish expectations for reliability. This could be as simple as mirroring set Federal Minimum Standards required for NEVI and CFI-funded chargers, which require at least 97% uptime and reasonable response time to downed charging stations. Such requirements greatly benefit consumers and ensure reliable operation of EV charging. This can be designed as a claw-back

²⁴ Saint Paul, Minnesota. EV Spot Network. <https://www.stpaul.gov/departments/public-works/transportation-and-transit/ev-spot-network#about>.

²⁵ Otter Tail Power Company. <https://www.otpc.com/ways-to-save/programs/electric-vehicle-rate/>.

term within contracts, for instance, to ensure site hosts remain good stewards of their charging infrastructure.

4. **Prioritize Underserved Communities:** Consider how deployment to underserved communities can be bolstered/prioritized with funds. While low-income is an easy default, it is recommended to consider broader underserved areas, which gives broader consideration for other factors that identify areas with more refinement/factors such as rural access and historically marginalized populations.
5. **Incorporate Utilities in Programming:** When developing EV programming, consider inviting utilities to co-host events or providing a table for a representative to distribute material. Collaboration is a chance to build partnerships with utilities and expand event outreach through their network of customers. Examples of programming include ride and drives, charging station/hub openings, and workplace charging workshops.

Conclusion

For the City of Bemidji to have the greatest impact in creating an inclusive electric future that will benefit all residents, a plan must be set forth that measures growth from an established baseline. This Roadmap does so by detailing the City's plan of action to expedite the transition of the local transportation sector to zero-emission vehicles, scale fleet charging and access, and create a more resilient electrical grid. The strategies and actions detailed follow a variety of timelines, ranging from short-term action (one year or less) to longer-term durations of multiple years. Core to this success is the fact that all public programs need to include the recommendations of stakeholders that live in disadvantaged and low-income communities, whose participation will ensure that programs are considering diversity, equity, and inclusion. By thoughtfully considering the policy options available to the City, the pathways that are chosen will be those with the highest level of impact, filling service gaps and resulting in the advancement of the City's EV market. These strategies will allow Bemidji to meet the ambitious goals and policy priorities outlined in this Roadmap.

Appendix A: Modeling Methodology

EVI-Pro Lite

NREL and INRIX data inform the inputs for the [Electric Vehicle Infrastructure Projection Tool \(EVI-Pro Lite\)](#), which predicts grid demand from charging infrastructure across various charging strategy scenarios and estimates how much charging is needed for the scenario of the local market. The inputs and results are below. Apart from the number of vehicles supported (EVs), PHEV Share, and Home Charging Access, the remaining inputs were left at their default values.

As Bemidji and Beltrami County are not explicitly modeled in EVI-Pro Lite, the Grand Forks metro area was used as a proxy, with results scaled to meet Bemidji's modeled EV adoption.

Vehicles supported:

- EVs: 328

Vehicle Mix

- EV Sedans %: 27
- EV C/SUVs %: 38
- EV Pickups %: 30
- EV Vans %: 5
- PHEV Share of PEV: 25% (the estimated share of PHEVs versus EVs)

PHEV Support

- Partial support - Calculate using half of the full support assumption.

Home Charging Access

- Percent of drivers with access to home charging: 42%

Results

- 130 Single Family Charging Ports
- 24 Shared Private Charging Ports
 - 23 Private Workplace Level 2 Charging Ports
 - 1 Multi-Unit Dwelling Level 2 Charging Port
- 33 Public Level 2 Charging Ports
- 7 Public DCFC Charging Port

Ride-hail support

- Conservative Electrification

eRoadMap

The [eRoadMAP](#) was created by Electric Power Research Institute (EPRI) to project approximate energy needs if all transportation (light-, medium-, and heavy-duty on-road vehicles) is electrified in 2030, showing what the highest energy need would be. While the eRoadMap is separate from the results of the EV Ready Analysis and EVI-Pro Lite results, it provides another lens of long-term demand considerations.

GEM Mapping

The [Geospatial Energy Mapper](#) is a tool that assists in distinguishing regions in city that are the most suitable for EV charging. The model maps below illustrate a current snapshot of EVSE suitability based on the parameters and the weight or influence given to each parameter.

The following tables list the parameters of each model, all of which were set to default weights (1).

Model 1: Population and Housing

Parameter	Weight
Electric Vehicle Charger Density - All Level 2 or DC Fast	1
Distance (m) to Substation (All capacities)	1
Housing Density – Large Multi-family	1
Land Cover	1
Percentage of Households Lacking a Vehicle	1
Population Density	1

Include the following layers for ease of visuals:

- Electric Vehicle Charging Stations (J4300 Level 2)
- Electric Vehicle Charging Stations (J3400 DC Fast)
- Electric Vehicle Charging Stations (Non-J3400 Level 2)
- Electric Vehicle Charging Stations (Non-J3400 DC Fast)

Model 2: EV Infrastructure and Demographics

Parameter	Weight
Transit Desert Index	1
Household Transportation Energy Burden	1
Distance to EV Charging Station - All Level 2 or DC Fast	1
Distance (m) to Substation (All capacities)	1
Housing Density – Large Multi-family	1
Land Cover	1
Percentage of Households Lacking a Vehicle	1
Population Density	1

Include the following layers for ease of visuals:

- Electric Vehicle Charging Stations (J4300 Level 2)
- Electric Vehicle Charging Stations (J3400 DC Fast)
- Electric Vehicle Charging Stations (Non-J3400 Level 2)
- Electric Vehicle Charging Stations (Non-J3400 DC Fast)

Appendix B: Additional DRVE Tool Analysis

DRVE Tool

The [Dashboard for Rapid Vehicle Electrification \(DRVE\) Tool](#) was created by the EC and its developer Atlas Public Policy. Pulling from federal resources and regularly updated (including recent models, average fuel costs, etc.), the DRVE Tool serves to be a cost-effective and user-friendly total cost of ownership (TCO) analysis tool for any entity seeking to electrify its fleet.

Fleet Vehicle Replacements

Shown below are all vehicles recommended for an EV replacement, based on the estimated percentage savings for that vehicle, compared to its conventional options. With the current market conditions and operational costs of these vehicles, the percentage savings shown can be captured for each vehicle across each vehicle's operational life.

VIN	Original Vehicle	EV Alternative	Avg Percent Savings from EVs
1GAZG1FA7E1199342	2026 CHEVROLET EXPRESS 2500 CARGO ICE GAS	2026 FORD TRANSIT VAN CARGO BEV ELECTRIC	29.75%
2FMPK4G93MBA20683	2026 FORD EDGE AWD ICE GAS	2026 VOLKSWAGEN ID.4 BEV ELECTRIC	22.21%
JN8AY2ADXR9709932	2026 CHEVROLET EQUINOX FWD ICE GAS	2026 CHEVROLET EQUINOX EV FWD BEV ELECTRIC	19.19%
2GKFLREK5D6334879	2026 CHEVROLET EQUINOX FWD ICE GAS	2026 CHEVROLET EQUINOX EV FWD BEV ELECTRIC	19.19%
1GNS6LED5SR220566	2026 CHEVROLET TAHOE 2WD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	18.61%
1GNSKDEC5KR372503	2026 CHEVROLET TAHOE 2WD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	18.61%
1GNSKLED9NR235121	2026 CHEVROLET	2026 KIA EV9 STANDARD	18.61%

	TAHOE 2WD ICE GAS	RANGE RWD BEV ELECTRIC	
1C4NJCBA3CD666342	2026 JEEP COMPASS 4WD ICE GAS	2026 VOLKSWAGEN ID.4 BEV ELECTRIC	9.35%
1GTRUAEK4RZ292322	2026 GMC SIERRA 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	2.98%
1GTV2TEH4EZ229235	2026 GMC SIERRA 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	2.98%
1FAHP2MK1GG122315	2026 CHEVROLET MALIBU ICE GAS	2026 FORD MUSTANG MACH-E RWD LFP BEV ELECTRIC	2.30%
1FAHP2MK2GG154321	2026 CHEVROLET MALIBU ICE GAS	2026 FORD MUSTANG MACH-E RWD LFP BEV ELECTRIC	2.30%
1GC0KUEG8FZ546475	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1GC2KVCG7DZ303481	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1GC2KVCG8DZ345027	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1GCHK23K98F173515	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1GCHK24U13E296384	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%

1GCHK24U75E296179	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1GCHK29VX3E293640	2026 CHEVROLET SILVERADO 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	1.02%
1FM5K8AB2PGC00146	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB3PGC00107	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB4MGA64498	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB4NGC23828	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB5RGA25975	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB7LGC35162	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB8SGA87666	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB8SGB20097	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB9LGC35163	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%

1FM5K8AB9SGB20030	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AB9SGB20335	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8ABOLGC35164	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8ABXSGA87555	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AR2HGE30557	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AR6GGC14760	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AR6HGB82782	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AR6KGA52850	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8ARXFGC07891	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8ARXJGA71657	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%
1FM5K8AWoNNA07179	2026 FORD EXPLORER RWD ICE GAS	2026 KIA EV9 STANDARD RANGE RWD BEV ELECTRIC	-4.02%

1FTFW1P83RKF36789	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1FTFX1E51KKC24594	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1FTRF14W87KC85619	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1FTRF17L03NB57868	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1FTRX12W97FA87933	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1FTRX12WO9KC16247	2026 FORD F150 PICKUP 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.22%
1C6RD7FP4CS228012	2026 RAM 1500 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-4.93%
1FV6HFBA9WH924902	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1FVXJLBB5XHA42243	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1HTSDPNN8PH533996	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1HTWDAZROCJ588585	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%

2NKMLD9X97M176914	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1NKBHJ8X8NR125242	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1NKBHJ8XXNR135559	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
1NKBLJ0X6EJ386636	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
3BKBLJ9X6KF240220	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
2NPNHD8X44M822261	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
2NPRLN9X39M780922	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
2NP3HJ8X7GM338448	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
2NP3HN8X2DM207785	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
3BPDHJ8X4MF110073	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%
3BPDHJ8XXSF118384	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-5.22%

1C6RR7XT0GS261351	2026 RAM 1500 CLASSIC 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-5.30%
1C6RR7XT4PS564374	2026 RAM 1500 CLASSIC 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-5.30%
1C6RR7XT6FS538177	2026 RAM 1500 CLASSIC 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-5.30%
1C6RR7XT6PS597988	2026 RAM 1500 CLASSIC 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-5.30%
1C6RR7XT7JS291860	2026 RAM 1500 CLASSIC 2WD ICE GAS	2026 CHEVROLET SILVERADO EV BEV ELECTRIC	-5.30%
2NKHHJ8X7EM407440	2026 KENWORTH T380 ICE DIESEL	2026 KENWORTH K270/K370 282 KWH BEV ELECTRIC	-5.69%
1GBKP32R6X3300222	2026 FREIGHTLINER MT45 ICE GAS	2026 FREIGHTLINER MT50E BEV ELECTRIC	-6.50%
1FVACYFE6JHJL1454	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-13.72%
1FVHCYDC75HN87100	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-13.72%
1FVACWDCX5HN90644	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-13.72%
1FVACWFD0PHNZ1181	2026 FREIGHTLINER M2 106 ICE DIESEL	2026 FREIGHTLINER EM2 194 KWH BEV ELECTRIC	-13.72%

1XPGDU9X47N685514	2026 FREIGHTLINER CASCADIA ICE DIESEL	2026 FREIGHTLINER ECASCADIA 291 KWH BEV ELECTRIC	-20.99%
1XPCDB9X0LD293228	2026 FREIGHTLINER CASCADIA ICE DIESEL	2026 FREIGHTLINER ECASCADIA 291 KWH BEV ELECTRIC	-20.99%
1FDXF47PX5EA34654	2026 FORD F450 XL ICE DIESEL	2026 RIZON E18L BEV ELECTRIC	-34.03%
1GCGC24K1SZ257826	2026 FORD F250 XL ICE DIESEL	2026 RIZON E18L BEV ELECTRIC	-37.40%
1GC2YLE72NF337850	2026 CHEVROLET SILVERADO 2500 WT 2WD ICE GAS	2026 RIZON E18L BEV ELECTRIC	-40.24%
1GC5YLE72RF408516	2026 CHEVROLET SILVERADO 2500 WT 2WD ICE GAS	2026 RIZON E18L BEV ELECTRIC	-40.24%
1GB3CYCG6FZ531790	2026 CHEVROLET SILVERADO 2500 WT 2WD ICE GAS	2026 RIZON E18L BEV ELECTRIC	-40.24%
1GBJC34U26E268901	2026 CHEVROLET SILVERADO 2500 WT 2WD ICE GAS	2026 RIZON E18L BEV ELECTRIC	-40.24%
1GT22REG1HZ273713	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT22REG5JZ279200	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%

1GT22REG6GZ299710	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT22REG8HZ166111	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT22ZCG3BZ343657	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT39LE70MF109667	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT39LE76MF239663	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT39LEy0MF224737	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT59LE70MF254880	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT59LE75MF250632	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GTHC24U73E308244	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GTHK44K79F136734	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT39LE75RF373832	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%

1GT49SE7XRF292176	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT59LE70RF383810	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT59LE77RF383786	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1GT5ULE75SF324224	2026 GMC SIERRA 2500 2WD PRO ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.00%
1FT8W3BT2HEE86299	2026 FORD F350 XL ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.90%
1FTRF3B6XBEB69991	2026 FORD F350 XL ICE GAS	2026 RIZON E18L BEV ELECTRIC	-43.90%
1FT7X2B61MED49801	2026 FORD F250 XL ICE GAS	2026 RIZON E18L BEV ELECTRIC	-44.90%
1FT7X2B64CEB84549	2026 FORD F250 XL ICE GAS	2026 RIZON E18L BEV ELECTRIC	-44.90%
1FTBF2B64BEC58242	2026 FORD F250 XL ICE GAS	2026 RIZON E18L BEV ELECTRIC	-44.90%
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Tiny Houses: A Housing Solution or a Planning Problem?

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Abstract

Tiny houses, characterised by their small size, resource efficiency, and alignment with minimalist living, have emerged in the Global North as a potential response to the challenges of housing affordability and environmental sustainability. This chapter critically examines the tiny house movement, evaluating its potential and limitations as both a housing solution and a planning challenge. By synthesising existing literature and empirical evidence, it explores the historical and cultural roots of the movement, the motivations of tiny house dwellers, and the extent to which tiny houses can address systemic housing and environmental issues. The chapter highlights the affordability benefits of tiny houses, such as lower construction costs and reduced financial burdens, while acknowledging barriers such as high land prices, financing difficulties, and restrictive planning regulations. Similarly, it assesses the environmental gains associated with tiny houses, including reduced resource consumption and carbon footprints, but recognises that transient occupancy patterns, car dependency, and construction practices can undermine their sustainability claims. Legal and planning barriers, particularly zoning laws and building codes, are identified as significant obstacles to the mainstream adoption of tiny houses. The chapter concludes by proposing strategies to overcome these challenges, including flexible planning policies, financial incentives, and collaborative approaches to infrastructure integration. By addressing these barriers, tiny houses can transition from a niche housing model into a transformative solution for affordable and sustainable living for those interested in this type of housing.

1. Introduction

The tiny house movement has gained considerable attention in recent years as an alternative response to rising housing costs, environmental degradation, and shifting lifestyle preferences in the Global North. Rooted in the principles of minimalism and sustainability, tiny houses challenge traditional housing models by emphasising compact, resource-efficient living spaces. Although often portrayed as a progressive solution to housing unaffordability and ecological concerns, the movement's growing prominence raises important questions about its broader implications and scalability within existing social, economic, and planning frameworks (Ford and Gomez-Lanier, 2017; Shearer and Burton, 2018).

The movement's origins are multifaceted, shaped by historical, cultural, and economic forces. From early influences such as Henry David Thoreau's advocacy for simple living to the more recent adoption of right-sized housing following the 2008 financial crisis, the appeal of tiny houses reflects both necessity and voluntary lifestyle choices (Alexander and Shearer 2019; Evans, 2021). While the contemporary movement often thrives in affluent contexts where small living aligns with sustainability and minimalism, the global reality of small dwellings is far more complex, shaped by poverty and limited access to basic services (Penfold et al., 2018; Smith, 2006).

Despite their potential, tiny houses remain a polarising phenomenon. Advocates highlight their capacity to reduce housing costs, promote environmental sustainability, and foster a stronger sense of community. However, practical challenges, including restrictive planning policies, land acquisition costs, and infrastructural barriers, often limit their broader adoption (James and Shahab, 2024; Shearer and Burton, 2021). The transient and sometimes informal nature of tiny house living further complicates their role as a long-term housing solution, raising questions about their viability in addressing systemic issues of housing inequality and environmental impact.

This chapter critically examines the potential and limitations of the tiny house movement, assessing its role as both a housing solution and a planning problem. It begins by exploring the historical and cultural origins of the movement, situating it within broader trends of minimalism and alternative living. The chapter then defines what constitutes a tiny house and examines the diverse profiles and motivations of its dwellers. The chapter further evaluates the extent to which tiny houses can address housing affordability and environmental sustainability, while also analysing the legal and planning challenges that hinder their wider adoption, including zoning laws, building codes, and infrastructure integration. Strategies to overcome these barriers are then discussed, offering pathways for policymakers, developers, and communities to facilitate tiny house development. In conclusion, the chapter synthesises the key arguments, reflecting on the movement's potential as a transformative yet contested model for addressing contemporary housing and environmental challenges.

2. What are the origins of the tiny house movement?

The tiny house movement, which emerged in the late 20th and early 21st centuries, has its roots in a convergence of social, economic, and environmental factors. It developed as a response to rising housing costs, environmental concerns, and a growing dissatisfaction with the traditional lifestyle centred around large, expensive homes and consumption-driven living. While the exact origins of the movement are complex (Harris, 2018), its growth and popularisation are often traced back to a combination of economic crises, environmental awareness, and influential figures and events that championed the virtues of smaller living spaces (Anson, 2014; Evans, 2021; Mutter, 2013).

The roots of the tiny house movement can be loosely traced to the minimalist ideals of the 19th and early 20th centuries, with influences from figures such as Henry David Thoreau (Alexander and Shearer, 2019; Copperwood, 2013). Thoreau's 1845 experiment in simple living at Walden Pond is often cited as an ideological precursor to the movement, as he advocated for a life unencumbered by material excess and close to nature. His small cabin and writings encapsulated the idea that a fulfilling life could be achieved through simplicity and self-sufficiency (Brown, 2016; Wilson and Wadham, 2023). However, while Thoreau's ideas influenced later generations, it was not until the late 20th century that the practical and physical manifestation of the tiny house movement began to take shape.

In the 1970s and 1980s, growing environmental consciousness, paired with a rising awareness of economic inequality, contributed to a rethinking of traditional housing. During this time, alternative living arrangements, such as communal living, small homes, and houseboats, began to gain traction among environmentally conscious communities and those seeking affordable, alternative housing solutions. Influential publications like Lloyd Kahn's (1973) 'Shelter' documented small and unconventional homes, reflecting a growing countercultural interest in simple living and alternative housing. The era also saw a renewed interest in sustainable living practices, laying the groundwork for the movement's environmental ethos.

The tiny house movement as we know it today is often credited to a few key figures and moments in the 1990s and early 2000s (Mitchell, 2014). Architect Sarah Susanka's (1998) book, 'The Not So Big House', argued against the trend of oversized homes, promoting instead a vision of right-sized housing focused on quality, functionality, and efficient design. Around the same time, designer Jay Shafer, widely considered a pioneer of the modern tiny house movement, founded the Tumbleweed Tiny House Company in 1999 (Bares et al., 2017). Shafer's designs for small, portable homes received widespread attention and became a central model for the movement, combining aesthetic appeal with the principles of simplicity and sustainability (Shearer and Burton, 2018).

The 2008 global financial crisis further accelerated the movement's growth, as financial instability led many individuals and families to reconsider the viability of traditional homeownership. The economic downturn highlighted the burdens associated with large mortgages and high maintenance costs, making the prospect of affordable, minimalistic living spaces increasingly appealing (Bauman, 2004; Colombini, 2019; Penfold et al., 2018). Additionally, rising ecological concerns in the 21st century, such as climate change and resource depletion, motivated many to seek environmentally friendly lifestyles, including those with smaller carbon footprints associated with tiny homes.

The movement has since grown into a global phenomenon, with tiny houses gaining popularity in countries such as the United States, Canada, Australia, and parts of Europe. However, it is important to note that this notion of tiny houses is primarily a feature of affluent societies, where small living often reflects a voluntary choice tied to minimalist values and

lifestyle aspirations. In contrast, in many other regions worldwide, people live in small dwellings out of necessity rather than choice, often constructing homes independently due to economic hardship and limited access to essential services like water, electricity, and sewage. Here, small living is not a lifestyle trend but a result of poverty and constrained opportunities (Penfold et al., 2018; Smith, 2006).

3. What constitutes a tiny house and who are tiny house dwellers?

Although a universally agreed-upon definition remains elusive, scholars generally agree on certain core characteristics that distinguish tiny houses from other forms of small dwellings. Shearer et al. (2018) define a tiny house as a dwelling with a floor area of 400 square feet (37 square meters) or less, excluding lofts, a size range that Evans (2020) suggests is generally accepted among tiny house advocates. Nevertheless, the definition of "tiny" can be culturally relative. As Shearer and Burton (2018) observe, a tiny house in the United States or Australia may be larger than one in densely populated cities such as Hong Kong, reflecting differing spatial norms and cultural expectations. In the United Kingdom, there is no formal definition for tiny houses; in planning terms, they are often legally classified as caravans, adding further complexity to their regulatory context (James and Shahab, 2024).

The distinction between tiny houses and other compact living arrangements, such as caravans or mobile homes, goes beyond physical dimensions or construction type. It includes a unique cultural identity that is central to the tiny house movement. According to Shearer and Burton (2021), tiny house dwellers see themselves as part of a distinct subculture rooted in sustainability, community, and a strong Do-It-Yourself (DIY) ethos. Ford and Gomez-Lanier (2017) similarly highlight that tiny houses embody an environmental and economic sustainability ethic, further reinforcing their cultural distinctiveness. This notion of culture extends to the flexibility of tiny house designs, which range widely in form and function. Weetman (2018) notes that tiny houses may include various types of structures, including shipping containers, mobile homes, hut conversions, yurts, caravans, even vans and trucks, each adapted to meet the specific lifestyle and values of their inhabitants. Shearer and Burton (2018) categorised tiny houses according to three structural factors, i.e., mobility, size and design, and four societal factors, i.e., affordability, sustainability, legal status and community focus.

Tiny houses can be viewed as a form of self-build housing, as they frequently involve the end users in the design and construction process. Unlike speculative developments, which are built for profit with minimal input from future occupants, tiny house projects often reflect the needs, values, and preferences of their inhabitants. Whether constructed as a DIY project, with the support of contractors, or through kit home providers, the development of tiny houses aligns with the principles of self-build by emphasising personalisation and user involvement (Gingell and Shahab, 2021; Sadler and Shahab, 2021). This approach not only

empowers individuals to create sustainable and cost-effective housing but also fosters a deeper connection to the homes they inhabit, distinguishing tiny houses from conventional speculative housing models.

The motivations for adopting a tiny house lifestyle are as varied as the dwellings themselves (Boeckermann et al., 2019). For many, tiny houses represent a paradigm-shifting choice, as Weetman (2018) describes it, appealing to those who seek to downsize and simplify their lives in response to what Anson (2014, p.294) calls the “manic pace of a consumerist economy.” Economic factors are also highly influential. Brown (2016) reports that in the United States (US), the average tiny house costs around \$23,000, compared to \$272,000 for a traditional family home. This affordability has increased access to homeownership, with 78% of tiny house residents in the US owning their home, significantly above the national average of 63.7% (Joint Centre for Housing Studies, 2015). However, some critics argue that while tiny houses may lower housing costs, they are not a panacea for the housing affordability crisis. Harris and Nowicki (2020) contend that micro-living models sometimes push living spaces below acceptable standards, addressing symptoms of housing issues without tackling underlying affordability challenges.

Environmental sustainability is another key attraction of the tiny house lifestyle. By virtue of their size, tiny houses generally require fewer resources for heating, cooling, and water usage, resulting in a lower carbon footprint compared to traditional homes (Schwartz, 2015; Jones and Kammen, 2011; Saxton, 2019). Carras (2019) underscores that the movement’s sustainability ethos is one of its central appeals. This stands in stark contrast to traditional housing, which significantly contributes to global environmental degradation. Housing accounts for approximately 28% of global carbon dioxide (CO₂) emissions through operational energy use, including heating, cooling, and lighting (Global Alliance for Buildings and Construction, 2019). Additionally, resource-intensive construction materials, such as cement, contribute another 8% to global CO₂ emissions (Lehne and Preston, 2018). These environmental impacts are exacerbated by inefficient energy use in larger homes and significant waste generation during construction and demolition. Tiny houses often mitigate these impacts by incorporating alternative, sustainable materials such as reclaimed wood or low-carbon concrete, thereby reducing the environmental costs associated with their construction.

In addition to environmental and economic benefits, tiny houses often foster social and communal interactions, offering a social dimension to this housing movement. Shearer and Burton (2018) and Kilman (2016) suggest that the close quarters of tiny house living encourage collaboration, shared activities, and stronger social bonds among both residents and their surrounding communities. These homes often prioritise shared spaces and cooperative living, creating environments that naturally promote interpersonal engagement. Jebbink (2019) echoes this, noting that tiny house residents are more likely to engage in collective daily routines, like cooking and dining together, promoting a sense of community. Carlin’s (2014)

research also found that the spatial intimacy of tiny houses deepens family connections, fostering closer relationships among household members.

4. Can Tiny Houses Truly Solve Housing Affordability and Environmental Challenges?

The tiny house movement, as discussed above, has been presented as a potential solution to challenges in housing affordability and environmental sustainability. Advocates champion its promise of cost-effective living and reduced ecological footprints. However, its capacity to fulfil these objectives is mediated by a complex interplay of social, economic, legal, and environmental factors.

Housing Affordability

Tiny houses are often posited as a viable response to the housing affordability crisis. Their small size, use of fewer materials, and efficient designs enable lower construction and operational costs compared to conventional housing (Wotton et al., 2018). For instance, tiny homes can be built for as little as \$20,000 to \$40,000, a fraction of the cost of traditional houses, which often exceed six figures in urban markets (Beam, 2015). Furthermore, tiny house villages have been proposed as models to combat homelessness, providing low-cost, semi-permanent housing for vulnerable populations. Examples like the Eden Village project in Springfield, Missouri, and the Veterans Community Project in Kansas City illustrate how such communities can provide stable and affordable housing for the chronically homeless and veterans, respectively (Evans, 2024; Zhang et al., 2022). Additionally, Dignity Village in Portland, Oregon, offers housing made from recycled materials, representing a cost-effective approach to combating homelessness (Zhang et al., 2022).

Beyond cost considerations, the financial flexibility tiny houses offer appeals to those seeking reduced economic burdens. Homeowners often experience lower utility bills and fewer maintenance expenses due to the smaller scale of their properties. These savings can help individuals redirect financial resources towards other needs, such as education, healthcare, or retirement savings (Beam, 2015; Mangold and Zschau, 2019). Furthermore, shared resources in tiny house villages, such as communal kitchens and gardens, enhance affordability and community cohesion, as observed in communities like Quixote Village in Olympia, Washington (Zhang et al., 2022). Studies also note that niche markets, such as student housing, retirees, and co-housing initiatives, present opportunities to expand the affordability of tiny houses (Mutter, 2013).

However, affordability is not universally achievable. Land acquisition costs, infrastructure development, and local regulatory requirements often inflate expenses. Many municipalities impose minimum square footage requirements or prohibit permanent habitation in structures classified as 'mobile' (Vail, 2016). These restrictions can force tiny house owners to purchase expensive plots of land or resort to informal arrangements, further

complicating affordability. Financing and insurance options for tiny homes also remain limited, with traditional mortgage models rarely accommodating non-conventional dwellings. This lack of financial integration often necessitates upfront cash payments, posing significant barriers for low-income individuals (Ford and Gomez-Lanier, 2017; Zhang et al., 2022). Additionally, transaction costs associated with finding land, obtaining planning permission, and navigating zoning requirements can further deter prospective owners (James and Shahab, 2024; Shahab, 2022).

Tiny house affordability is also affected by material costs and the nature of bespoke designs. While DIY builds can mitigate some expenses, not all prospective owners possess the necessary skills, time, or resources for construction. In such cases, reliance on professional builders often results in higher costs, which can rival those of small conventional homes (Shearer and Burton, 2018; Dickinson and Shahab, 2021). Additionally, transportation costs for mobile units and limitations on where they can legally park add to financial constraints, further complicating their affordability for wider demographics (Shearer and Burton, 2021). As Brokenshire (2018) observes, inconsistent planning regulations exacerbate these challenges, particularly for tiny houses on wheels, which are often classified as caravans rather than permanent dwellings.

Environmental Sustainability

Tiny houses are frequently praised for their reduced environmental impact. Their small footprint minimises the use of construction materials, and their efficient designs promote lower energy consumption during operation. Features such as solar panels, rainwater harvesting systems, and composting toilets further enhance their sustainability credentials (Beam, 2015). Research indicates that the energy demands of a tiny house are substantially lower than those of a standard single-family home, reducing greenhouse gas emissions (Wotton et al., 2018). Moreover, the adoption of alternative building materials, such as reclaimed wood or recycled steel, significantly decreases the embodied energy of tiny homes, contributing to a more sustainable construction process (Ford and Gomez-Lanier, 2017; Zhang et al., 2022). A study by Crawford and Stephan (2020) found that tiny houses can reduce per capita greenhouse gas emissions by up to 70% over their life cycle compared to traditional houses.

Despite these advantages, the environmental benefits of tiny houses are not absolute. The transient occupancy patterns observed in the tiny house movement often limit their long-term sustainability impact. Many tiny house owners use their dwellings as secondary or vacation homes rather than primary residences, thereby negating potential ecological gains by maintaining traditional housing elsewhere (Mangold and Zschau, 2019). Second homes, whether traditional or tiny, also contribute significantly to housing crises by reducing the availability of primary residences and driving up property prices. Moreover, when energy-intensive materials are used instead of repurposed or sustainable alternatives, the environmental ethos of the movement is undermined (Shearer et al., 2019). For instance,

prefabricated designs and transportation requirements for mobile units can add to the carbon footprint of these homes (Zhang et al., 2022). Vasseur et al.'s (2022) study also found that most Germans interested in tiny houses prefer rural or suburban locations, which may conflict with sustainability goals when car dependency increases, and public transport becomes less viable.

Furthermore, the life cycle environmental benefits of tiny houses depend heavily on their integration within existing urban or rural contexts. A significant challenge arises from the reliance on off-grid solutions, such as solar panels and composting toilets, which, while essential for sustainability, often conflict with municipal utilities and building codes. This regulatory and logistical misalignment creates hurdles for tiny house owners seeking to maintain a low environmental impact in urban or suburban areas (Vail, 2016; Ford and Gomez-Lanier, 2017). Additionally, policy and infrastructure gaps limit the incorporation of tiny houses into urban planning frameworks, particularly concerning access to public transport and shared utilities. Communities like Boneyard Studios in Washington, D.C., and Mobile Loaves & Fishes in Austin, Texas, illustrate the necessity for policy shifts to align with long-term environmental goals (Zhang et al., 2022). These examples underscore the importance of designing tiny house developments with enhanced accessibility to public infrastructure, which is crucial for maximising their overall sustainability outcomes (Crawford and Stephan, 2020).

The movement's reliance on individual efforts and niche markets limits its scalability for broader environmental impact. While some tiny house developments incorporate shared green spaces and community farming initiatives, these remain exceptions rather than the norm. Additionally, challenges such as weatherproofing, insulation, and energy efficiency in different climatic conditions can undermine sustainability claims if not addressed during the design phase (Mutter, 2013). Addressing these challenges will require standardised construction codes and greater collaboration between builders, policymakers, and environmental advocates (Shearer and Burton, 2021). Brokenshire (2018) also highlights how inconsistent global standards and a lack of uniformity in planning approaches hinder the full adoption of sustainable practices within the movement.

According to Böllert (2019), autonomy and environmental consciousness are key motivators for many European tiny house dwellers, who often pursue a minimalist lifestyle to reduce their ecological footprint. However, as Cumberbatch-Pearson (2020) notes, urban implementations of tiny houses face distinct challenges, including concerns over congestion and slum-like developments if poorly planned. Therefore, integrating aesthetic and functional sustainability into urban design is critical to their broader acceptance. Vasseur et al. (2022) further emphasise the need for supportive policy frameworks in Germany, noting that without legal and financial incentives, the uptake of tiny houses will remain limited to niche markets.

Tiny houses have potential to reduce environmental footprints, but realising these benefits requires systemic integration into broader housing and sustainability policies. To maximise their ecological impact, tiny houses should be paired with other green initiatives,

such as urban densification and renewable energy adoption, ensuring their contributions extend beyond individual households. This alignment between individual and collective efforts can transition tiny houses from a niche solution to a scalable model for sustainable living (Shearer and Burton, 2018).

5. How Can Tiny Houses be Integrated into Planning Policies and Regulatory Frameworks?

The integration of tiny houses into formal planning systems and regulatory frameworks involves both challenges and opportunities. Existing policies, such as zoning laws and building regulations, often create obstacles to the widespread adoption of tiny houses. However, these challenges provide an opportunity to reconsider planning and regulatory frameworks and develop more inclusive approaches that accommodate alternative housing models. By adapting policies and introducing innovative practices, planners and policymakers can address regulatory, economic, and infrastructural barriers while ensuring that safety, affordability, and sustainability standards are maintained. This section outlines strategies to overcome these challenges and support the integration of tiny houses into formal housing systems.

Overcoming Regulatory Barriers

One of the primary hurdles facing the development of tiny houses is navigating planning regulations, restrictive zoning, and building codes. In many jurisdictions, zoning laws limit the minimum size of dwellings, often excluding tiny houses from being classified as legal residences (Vail, 2016). To overcome this, planners could introduce ‘tiny house overlay zones’, where building codes are adapted to accommodate smaller dwellings. Such zones have been piloted in places like Fresno, California, where accessory dwelling unit regulations were modified to legalise tiny houses on wheels (Shearer and Burton, 2021). Moreover, policymakers could consider updating international building standards. The inclusion of Appendix Q in the International Residential Code (IRC) was an important step in standardising tiny house construction, providing specific guidelines for dwellings under 400 square feet (Crawford and Stephan, 2020). Local governments could adopt and expand upon these standards to address region-specific needs, ensuring tiny houses are safe and liveable while streamlining the permitting process.

Adapting Zoning Laws

In countries with a regulatory planning system, flexible zoning laws are essential for integrating tiny houses into urban, suburban, and rural settings. Many municipalities currently restrict the placement of tiny houses to areas zoned for mobile homes or recreational vehicles, effectively marginalising this housing model. Introducing more inclusive zoning categories, such as mixed-use zones or high-density residential zones, could allow tiny houses to coexist with traditional housing while diversifying neighbourhoods (James and Shahab, 2024).

Planners could also encourage the development of tiny house villages by designating parcels of land specifically for clustered small dwellings. These villages, like those established in Portland, Oregon, and Olympia, Washington, have proven effective at providing affordable and community-oriented housing (Evans, 2024). Clustered zoning not only reduces individual land costs but also facilitates shared resources, such as communal gardens and utility infrastructure, enhancing sustainability and social cohesion.

Financial Incentives and Support

To make tiny houses more accessible, financial support from both public and private sectors is essential. Policymakers could introduce subsidies, tax breaks, or low-interest loans for tiny house projects, especially those aimed at low-income populations or individuals seeking sustainable housing (Böllert, 2019). For instance, grants for developers could offset infrastructure costs in tiny house villages, while buyers could benefit from streamlined financing mechanisms, such as specialised mortgages or rent-to-own programs (Ford and Gomez-Lanier, 2017). Private sector engagement is equally crucial. Banks and credit unions could be encouraged to develop lending products tailored to the unique needs of tiny house buyers. Partnerships between financial institutions, local governments, and non-profits could further bridge the gap, ensuring that affordable housing solutions like tiny houses are viable options for a broader demographic. Beam (2015) highlights successful collaborations where philanthropic initiatives and community involvement provided resources for tiny house projects designed to assist vulnerable populations, such as the homeless.

Infrastructure and Utility Integration

Ensuring that tiny houses are well-integrated into municipal infrastructure is critical for their long-term success. Many tiny house owners rely on off-grid solutions, such as solar panels and composting toilets, which may conflict with existing utility systems. Policymakers could introduce hybrid utility models, allowing tiny house communities to combine off-grid technologies with municipal services. For example, tiny house villages could be equipped with shared utility hubs, providing water, electricity, and waste management while reducing individual costs and environmental impact (Cumberbatch-Pearson, 2020).

Additionally, planners could prioritise the use of underutilised urban land for tiny house developments. Vacant lots, abandoned properties, and former industrial sites offer opportunities for creating compact housing solutions. Policies that incentivise the conversion of such spaces into tiny house communities could address both housing shortages and urban decline (Zhang et al., 2022). In the United States, cities like Kansas City have successfully integrated tiny houses into urban frameworks through collaborations with non-profits, creating models for scaling similar projects (Evans, 2020).

Enhancing Public Perception and Acceptance

Public resistance to tiny houses often stems from misconceptions about their quality, aesthetics, and impact on neighbourhood character. Educational campaigns showcasing the benefits of tiny houses, such as affordability, sustainability, and community building, can help shift public opinion (Shearer and Burton, 2018). Municipalities could collaborate with architects and developers to create visually appealing tiny house designs that blend seamlessly with existing neighbourhoods, mitigating aesthetic concerns. Furthermore, pilot projects and demonstration sites can serve as valuable tools for increasing public acceptance. Successful examples of tiny house communities, such as the Hope Village in Medford, Oregon, provide tangible evidence of their potential to address housing needs without compromising neighbourhood standards. By highlighting these successes, stakeholders can build community support and reduce opposition to future developments. Wabel (2024) suggests that public acceptance also hinges on aligning tiny house developments with broader sustainability goals, such as promoting green infrastructure and urban densification.

Collaborative Policy Development

The successful integration of tiny houses into planning systems and regulatory frameworks requires collaboration across multiple levels of governance and with diverse stakeholders. Local governments, developers, non-profits, and community groups should work together to create policies that balance the needs of tiny house dwellers with broader urban planning and environmental objectives. Participatory planning processes, where community members contribute to the design and implementation of tiny house projects, can enhance trust and ensure that developments align with local priorities (Mutter, 2013).

Moreover, international cooperation could accelerate the adoption of best practices. Countries with established tiny house movements, such as the United States and Australia, offer valuable insights into effective regulatory frameworks and community integration strategies. Policymakers could adapt these models to local contexts, fostering innovation and avoiding common pitfalls. Shearer et al. (2018) note that inter-governmental partnerships can facilitate knowledge exchange, improving the efficiency and inclusivity of planning processes for tiny houses.

6. Summary and Conclusion

This chapter has critically examined the tiny house movement's potential and limitations, assessing its dual position as a housing solution and a planning challenge. Emerging as a response to the escalating issues of housing affordability, environmental degradation, and shifting lifestyle values, the tiny house movement reflects a broader re-evaluation of societal norms surrounding housing, consumption, and sustainability. By emphasising minimalism and resource-efficient living, tiny houses challenge the dominance

of large-scale, resource-intensive housing models while providing an alternative that aligns with principles of environmental and economic sustainability. However, the movement's ability to offer meaningful, long-term solutions is mediated by a complex interplay of social, economic, legal, and infrastructural factors that often restrict its broader adoption and scalability.

The chapter began by situating the tiny house movement within its historical and cultural context. Although its roots can be traced back to 19th-century minimalist ideals, such as those promoted by Henry David Thoreau, the modern tiny house movement emerged in the late 20th century and gained significant momentum following the 2008 financial crisis. Economic instability, coupled with growing environmental awareness, prompted individuals to seek alternatives to traditional homeownership, leading to the popularisation of small, affordable, and efficient homes. Yet, while tiny houses have flourished in affluent societies where small living represents a voluntary lifestyle choice, they stand in stark contrast to small dwellings born out of necessity in economically disadvantaged contexts. This duality underscores the importance of examining tiny houses not only as cultural phenomena but also as practical responses to global housing challenges.

In assessing the movement's ability to address housing affordability, the chapter has highlighted both its opportunities and its limitations. On one hand, tiny houses offer lower construction costs, reduced utility expenses, and increased access to homeownership for individuals who might otherwise be priced out of the housing market. Case studies, such as tiny house villages for the homeless and veterans in the United States, demonstrate the potential of this housing model to provide affordable and dignified living solutions for vulnerable populations. Furthermore, the movement's emphasis on community-oriented living, as seen in clustered developments with shared resources, further enhances its appeal by promoting social cohesion and reducing individual financial burdens.

However, affordability is far from universally achievable. The chapter has shown that high land acquisition costs, financing difficulties, and restrictive zoning regulations often counteract the economic advantages of tiny houses. In many jurisdictions, minimum dwelling size requirements and building codes exclude tiny houses from formal housing markets, forcing prospective owners to resort to informal arrangements. Furthermore, the lack of financial instruments tailored to tiny houses, such as appropriate mortgage or insurance options, creates additional barriers for low-income individuals who might benefit most from affordable housing alternatives. These structural challenges suggest that while tiny houses have the potential to address affordability, realising this potential requires significant changes in financial and planning systems.

Environmental sustainability is another central promise of the tiny house movement. By virtue of their small size, tiny houses generally consume fewer resources during construction and operation, leading to lower energy consumption and reduced carbon footprints compared to traditional homes. Features such as solar panels, rainwater harvesting systems,

and composting toilets further underscore the movement's environmental credentials, enabling off-grid living and reducing reliance on municipal infrastructure. Studies have demonstrated that tiny houses can achieve substantial reductions in greenhouse gas emissions over their life cycle, contributing to broader sustainability goals.

Nevertheless, the chapter has also identified important caveats regarding the movement's environmental impact. For instance, transient occupancy patterns, where tiny houses are used as secondary residences or vacation homes, can undermine their sustainability benefits, particularly when owners maintain traditional homes alongside their smaller dwellings. Similarly, the reliance on mobile units in rural settings often increases car dependency, offsetting the environmental gains associated with resource-efficient living. Furthermore, the sustainability of tiny houses is contingent upon the materials and technologies used in their construction; energy-intensive materials or poorly designed units can negate the ecological benefits typically associated with small living spaces. These findings emphasise that while tiny houses have significant environmental potential, realising this promise requires careful attention to their design, location, and life-cycle impact.

The chapter also explored the legal and planning barriers that constrain the mainstream adoption of tiny houses. Zoning laws, building codes, and infrastructure requirements frequently position tiny houses outside of formal planning systems, limiting their integration into urban and suburban contexts. While innovative approaches such as overlay zoning, accessory dwelling unit regulations, and clustered tiny house developments offer promising solutions, their implementation remains uneven and highly localised. The lack of uniformity in planning regulations further exacerbates these challenges, particularly for tiny house on wheels, which are often classified as temporary structures rather than permanent residences.

To overcome these barriers, the chapter has highlighted the importance of flexible and inclusive planning policies that recognise the diverse forms and functions of tiny houses. Strategies such as financial incentives, including tax breaks and subsidies for tiny house developments, could make this housing model more accessible to lower-income populations. Similarly, infrastructure solutions, such as shared utility hubs and the adaptive reuse of underutilised urban land, offer opportunities to integrate tiny houses into existing housing frameworks while enhancing their affordability and sustainability. To fully harness the potential of tiny houses to alleviate housing shortages, policies that restrict or disincentivise the use of properties as second homes are crucial. For instance, introducing higher taxes on second home ownership or implementing zoning restrictions could help prioritise housing for permanent residents. Collaborative approaches, involving policymakers, developers, and community stakeholders, are also essential to addressing public perceptions and ensuring that tiny houses contribute meaningfully to housing diversity and urban sustainability.

The belief that larger houses signify success, comfort, and status is deeply embedded in societal norms across both the Global North and South, shaped by cultural expectations and reinforced by real estate marketing. This dominant narrative often positions tiny houses as a

compromise or an inferior option, limiting their broader appeal and adoption. To challenge this perspective, it is important to promote the economic, environmental, and social benefits of smaller living spaces. Public education campaigns and the showcasing of innovative, aesthetically appealing tiny house designs can help shift perceptions by demonstrating that smaller homes can provide high-quality, sustainable living. By reframing the notion of housing success to prioritise sustainability, efficiency, and affordability, it is possible to foster a more balanced view of housing options, increasing demand for tiny houses as a viable and desirable choice.

In conclusion, the tiny house movement offers a compelling alternative to traditional housing models, with potential to address the pressing challenges of housing affordability and environmental sustainability. However, realising this potential requires systemic changes in planning, financing, and governance frameworks to overcome the structural and regulatory barriers that currently limit the movement's scalability. While tiny houses alone cannot resolve global housing issues, their integration into broader housing systems could provide a valuable pathway toward more sustainable, affordable, and inclusive living solutions for those interested in this type of housing.

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Projections of Homeownership Rates and Household Growth by Tenure for 2025–2035

AUGUST 2025 | DANIEL McCUE, CHRIS HERBERT, AND RIORDAN FROST



JOINT CENTER FOR
HOUSING STUDIES
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Introduction

The Center's 2025 household projections provide estimates of the future number of households in the US overall and by age and race/ethnicity for the next twenty years (McCue 2025). But the projections do not estimate how this growth will be split between homeowner and renter households, nor do they offer a prediction of changes in the homeownership rate. Such predictions of tenure are useful in providing a more detailed picture of future housing demand for units for rent or for sale, but are subject to much greater uncertainty than predictions of the overall number of households as they are influenced not only by the underlying demographics of age and race that are key drivers of the household projections, but also by more immediate and changeable financial realities that influence the ability to buy a home.

This paper extends the demographically driven 2025 household projections to include household counts by tenure through 2035 under three scenarios for future homeownership rates. The scenarios include one where homeownership rates remain constant by age and race over the next ten years, essentially isolating how changes in the age and racial composition of the population will influence homeownership rates, all else equal. This baseline scenario results in an overall homeownership rate that remains constant in 2025–2035. A second scenario has each age and race group maintain a historically average trajectory for homeownership as they age over the next ten years, which effectively represents a case of modest growth in overall rates. This scenario leads to a 0.8 percentage point rise in the overall homeownership rate in 2025–2035. A third scenario has younger cohorts follow historically low trajectories for homeownership as they age over the next ten years, which is intended to reflect the potential for today's current affordability challenges to limit transitions for young adults over the coming decade. This scenario represents a case of modest declines in overall rates and results in a -1.6 percentage point decline in the overall homeownership rate in 2025–2035. The scenarios were designed to provide estimates of the most plausible range of variation in homeownership rates that would be expected under normal market conditions, and not the full range of changes in homeownership rates possible if conditions change. Indeed, much more dramatic swings in homeownership rates are certainly possible, as the experience of the early 2000s illustrates.

The paper begins by reviewing recent trends in homeownership rates that represent the starting point for our projections. We then examine trends in homeownership rates by age cohorts over recent decades to illustrate the typical life course of homeownership attainment and how variations in market conditions have influenced the homeownership trajectories of different generations over time. These age cohort trends in homeownership rates will form the basis for our projection scenarios. We briefly

describe the main drivers of homeownership rates, including market conditions, preferences for owning and renting, and changes in the age and racial/ethnic profile of the population. After reviewing the data and methodology used in the projections, we present the result of our projections in terms of homeownership rates overall and by age and race/ethnicity as well as in terms of the absolute growth in owner and renter households. The paper concludes with a summary of findings and a caution about the difficulty of predicting homeownership rates given inherent uncertainties about market conditions over a ten-year period.

Trends in Homeownership Rates Since the Last JCHS Tenure Projections

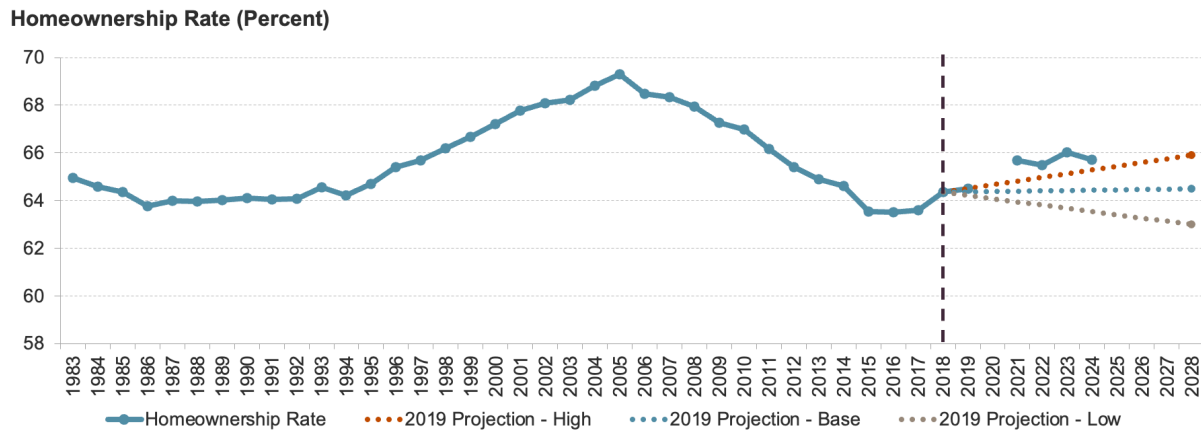
The Center's last tenure projections were produced in 2019 with data from 2018. At that time, the homeownership rate had just begun to recover after having been in decline for more than ten years (Spader 2019). Still, after a decade of substantial declines it remained unclear at the time whether homeownership rates would continue to rise or if the rebound would falter or even be reversed. Given this uncertainty, the Center's 2019 tenure projections developed three scenarios—base, high, and low—to project possible future trajectories of the homeownership rate. The base scenario held 2018 homeownership rates constant by age, race, and household type. The high scenario assumed rates for each group would continue to rebound to either their historic average rate from 1988–2018 or the 2018 rate if current rates were above that long-term average. The low scenario assumed that the rebound in rates in 2016–2018 would end and rates would return to a period of decline, with the fall after 2018 being proportional to the increase in rates assumed in the high scenario.

The 2019 tenure projections resulted in a base scenario where the homeownership rate remained relatively constant for ten years. Specifically, it projected a modest 0.2 percentage point increase in the homeownership rate, rising from 64.3 percent in 2018 to 64.5 percent in 2028, with the slight increase attributable to the increased share of households in older age groups for which homeownership rates are higher. The high scenario projected a 1.6 percentage point increase in the homeownership rate over ten years to 65.9 percent in 2028, while the low scenario, in contrast, projected the homeownership rate would decrease by a roughly similar amount, declining 1.3 percentage points to 63.0 percent in 2028.

In the years following the publication of this projection, homeownership rate changes had, until recently, outpaced even those in the Center's high-scenario projection—highlighting the great degree to which unpredictable changes to outside macroeconomic factors can impact homeownership rates (**Figure 1**). Spurred by a homebuying spree made possible by the low interest rates available during the

pandemic, the homeownership rate increased to 65.9 percent in 2023. Since then, however, rates edged down to 65.6 percent in 2024 and then 65.1 percent in early 2025, according to the Housing Vacancy Survey (HVS).

Figure 1: Growth in the Homeownership Rate After 2019 Exceeded Even the High-Scenario Projection



Notes: The dashed line indicates the latest year of data used in making the 2019 JCHS tenure projections. Data for 2020 is not shown as estimates were unreliable due to pandemic effects on data collection.

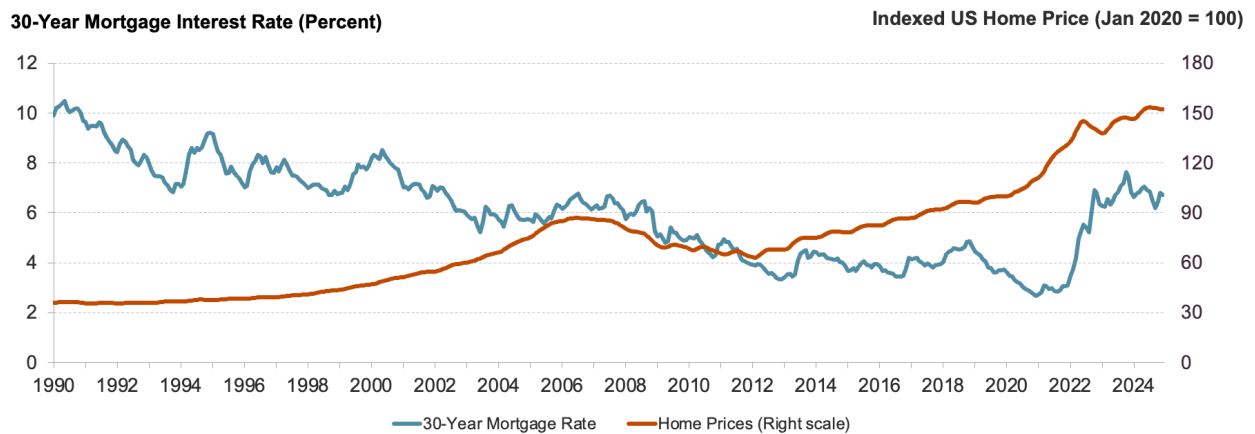
Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota and JCHS tenure projections (Spader 2019).

The recent trends reflect very favorable conditions for entry into homeownership after 2018 that were outside the range of the 2019 tenure projections, helping to spur the large gains in the homeownership rate. However, these conditions ended abruptly in 2022. Leading up to the pandemic, a favorable economy and an increase in real earnings put many workers on solid economic footing (McCall 2024). Then, for those who were spared the negative economic impacts of the pandemic, the market became very favorable for homebuying as the 30-year mortgage rate fell below 3.5 percent in April 2020 and continued to drop to a low of 2.65 percent in January 2021, according to Freddie Mac’s Primary Mortgage Market Survey (PMMS). These low interest rates gave households greater purchasing power, which when added to other motivating factors, including a pandemic-induced desire for more space and location flexibility enabled by remote work, resulted in a flurry of homebuying activity in 2020 and 2021 (Fry 2021; Palim and Huang 2023). Homebuying was further enabled by the excess in cash savings that skyrocketed during the pandemic (Abdelrahman and Oliveira 2023).

Beginning in 2022, however, conditions changed quickly with a sharp drop in affordability making it much more difficult to buy a home. Thirty-year mortgage interest rates more than doubled

over the course of 2022, from 3.2 percent in January to over 7.0 percent by November, and have largely remained between 6.0 and 7.0 percent since. Meanwhile, despite these higher interest rates, home prices continued to grow nationwide due to tight market conditions. According to the S&P Case-Shiller Home Price Index in August of 2024, home prices were up over 15 percent since January of 2022 alone (when interest rates began to rise) and were fully 53 percent higher than in January of 2020 (**Figure 2**). Higher home values coupled with higher prevailing interest rates have priced many out of the market. Consider that the annual income needed to afford the median-priced home rose from \$79,330 in 2021 to \$121,860 in 2023 and then rose further to \$126,670 in 2024, according to analysis in the most recent “State of the Nation’s Housing” report (JCHS 2025). As a result, the homeownership rate increase slowed to just 0.1 percentage point in 2023 and then declined by 0.3 percentage points in 2024, according to the HVS.

Figure 2: Despite Higher Interest Rates, US Home Prices Continued to Rise in 2023 and 2024



Note: The Home Price Index is not seasonally adjusted.

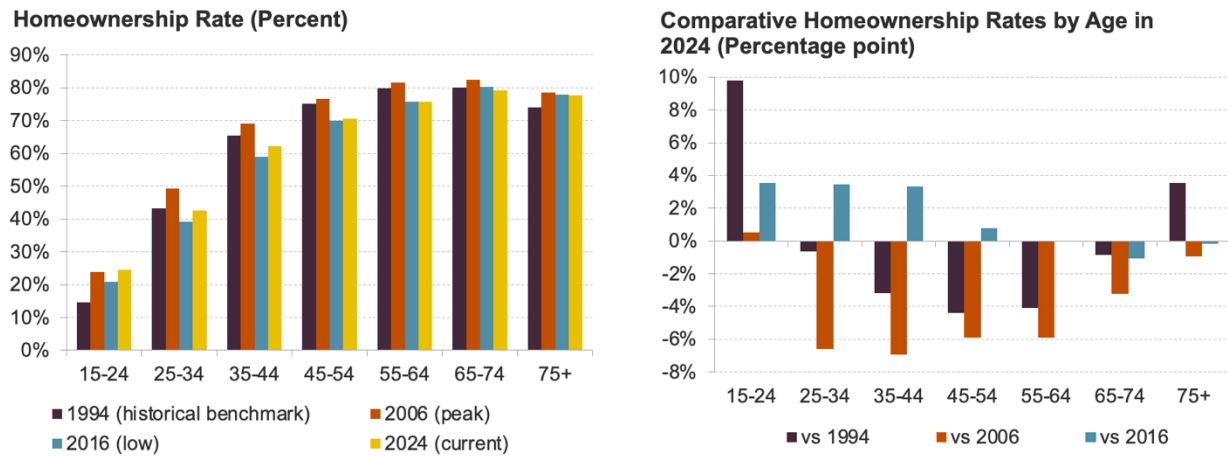
Source: S&P Dow Jones Indices, S&P CoreLogic Case-Shiller U.S. National Home Price Index, and Freddie Mac, Primary Mortgage Market Survey, retrieved from FRED, Federal Reserve Bank of St. Louis; <https://fred.stlouisfed.org>, August 7, 2025.

Following the Homeownership Rate Trajectories of Different Birth Cohorts

Despite the gains since the low point reached in 2016, homeownership rates for specific age groups—particularly those at ages where entry into homeownership was most likely to have been delayed by the Great Recession—remain below those previous generations held at similar ages (**Figure 3**). The lingering shortfall in homeownership relative to previous cohorts no doubt reflects a variety of factors, including changes in rates of marriage and childbearing and general preferences for owning a home. However,

lingering financial challenges also contribute to the lower ownership rates particularly for households between age 35 and 65, who continue to own homes at much lower rates than previous generations.

Figure 3: Homeownership Rates of Middle-Aged Households Remain Farthest Below 1994 Levels



Note: Data are three-year trailing averages.

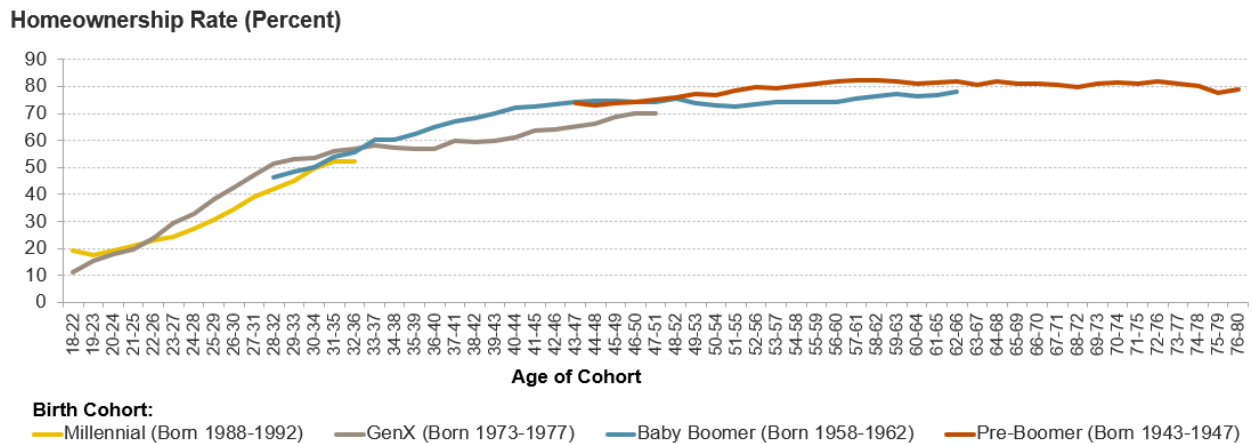
Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

Homeownership rates have historically followed certain common trajectories through life. Rates rise most sharply between the ages of 20 and 40 as adults pass through the peak years of first-time homebuying. Increases in homeownership rates slow for households in their forties as the majority of households aiming to become homeowners have already done so by that age. By age 60, homeownership trajectories flatten out and rates remain relatively unchanged through age 80.

The homeownership rate trajectories of specific birth cohorts can be heavily influenced by economic cycles that impact household incomes, housing price cycles, changes in mortgage credit access and terms, and other conditions that affect both the ability to become a homeowner and the financial appeal of homeownership. These events can cause a lasting change in homeownership rates for various birth cohorts depending on what age they are when they encounter them. For example, homeownership rates for a birth cohort may be significantly lowered if that group experiences a large housing downturn or recession when it is at peak homebuying ages—i.e., blocked from homeownership at ages at which homeownership rates for previous cohorts would have been rising sharply. In contrast, homeownership rates of older adults may be largely unaffected by economic and housing market booms and busts because most of those who wish to own are already homeowners.

To illustrate how past market conditions have affected the homeownership rate trajectories of a selection of different generations, **Figure 4** shows homeownership rates by age since 1990 for four five-year birth cohorts: those born 1943–47 (pre-boomers), who were aged 63–67 in 2010; those born 1958–62, who were aged 48–52 in 2010 (late-stage boomers); those born 1973–77, who were aged 33–37 in 2010 (late-stage Gen Xers); and those born 1988–92, who were aged 18–22 in 2010 (late-stage millennials) and so mostly had yet to form households. Figure 4 shows how the Great Recession affected each of these cohorts: the homeownership rate trajectories of late-stage boomers, Gen Xers and millennials were lowered in the mid-2000s and have yet to catch up to their predecessor generations.

Figure 4: The Great Recession Lowered the Homeownership Rate Trajectories of Millennial, Gen X, and Baby Boomer Cohorts



Notes: Data from 2020 are excluded due to pandemic effects on data collection.

Source: JCHS tabulations of US Census Bureau, 1990–2024 Current Population Surveys via IPUMS-CPS, University of Minnesota.

For each of these cohorts, homeownership rates begin to diverge from those of their predecessors in the years following the Great Recession and the foreclosure crisis. Figure 4 shows how this happened when the millennial cohort was in their mid-20s, when the Gen X cohort was in their mid-30s, and when the boomer cohort was in their early 50s. Five years later, specifically when the millennial cohort is age 27–31, their homeownership rate of 39.0 is fully 7.8 percentage points lower than the 46.8 percent rate of Gen X at that age. Meanwhile, the Gen X cohort homeownership rate of 59.2 percent at age 38–42 is fully 9.1 percentage points below the 68.3 percent rate of the boomer cohort at that age. Meanwhile, at age 53–57, the boomer cohort’s homeownership rate of 74.4 percent trails the 79.4 percent rate of the pre-boomers at that age by a full 5.0 percentage points.

Following the various lines, however, we see that these same three cohorts then experienced a rise in their homeownership trajectories as the housing market and economy recovered from the Great Recession, with rate increases that exceed those of their predecessors at similar ages. However, at last measure in 2024, each cohort's current homeownership rate still lags the previous cohort's homeownership rate by several percentage points. The steepest gains in recent years were for the youngest cohort, who were entering prime first-time buyer ages just as the market turned favorable, while the Gen X and boomer birth cohorts, who had aged out of peak first-time buyer ages when markets turned favorable, saw less change in their homeownership trajectories. Still, the homeownership rate of the millennial cohort in 2024 at age 31–35 remains 3.9 percentage points below homeownership rates held by the Gen X cohort at that age, while rates for the Gen X and boomer cohorts in 2024 remain 4.5 percentage points and 3.2 percentage points below those of their predecessors at similar ages.

Drivers of Homeownership Rate Trends

At a basic level, homeownership rates reflect the population's desire to own their homes and their ability to do so. Over time the desire to own a home has proven remarkably resilient in the US, despite the substantial turmoil in the housing market that accompanied the Great Recession.¹ The desire and ability to own a home increase with age as people enter a period of life when residential stability is valued and when income and wealth better support homeownership. The preference for owning a home differs little by race and ethnicity, although substantial and persistent differences in household income and wealth and the legacy of discrimination in housing and mortgage markets produce a similarly persistent disparity in homeownership attainment. Thus, at times when underlying market conditions are stable, demographic factors of age and race/ethnicity can be used as proxies to explain much of the overall trends in homeownership. In fact, the analysis by Spader and Herbert (2016) finds that from 1985 to 1995 demographic shifts in the population accounted for much of the trend in overall homeownership rates—which remained fairly stable over the period. Demographic factors therefore provide a solid foundation for any tenure projections.

But as history has shown, changes in market conditions can quickly change households' ability to own homes and drive big movements in homeownership rates that easily overpower the impact of underlying demographics, making predictions of future homeownership rates subject to a wide margin

¹ See Drew and Herbert (2013) and McCabe (2018) for reviews and analysis of homeownership preferences.

of error. Spader and Herbert (2016) examine the boom/bust period for homeownership rates between 1995 and 2015 and conclude that changes in housing markets and credit conditions were behind most of the dramatic shifts in homeownership rates during that period of time, while the cumulative effect of changes in the demographic profile of households by age, race/ethnicity, and family type, as well as income, employment, and other variables did little to explain the trends.

Thus, projections of homeownership rates based on changes in the demographic profile of the population may be fairly accurate during more stable market periods, but subject to substantial error during periods of significant changes in market conditions.

Looking forward, demographic changes over the next ten years are relatively predictable compared to market changes. In general, there are two significant demographic factors that will influence overall homeownership rate trends: the changing age structure of the population and growing racial/ethnic diversity. According to the 2025 household projections, between 2025 and 2035 the number of households headed by a person aged 65 and over is projected to grow by nearly 20 percent, substantially raising the share of households headed by older adults. Given that homeownership rates rise with age, this shift will work to increase overall homeownership rates.

At the same time, households headed by Black, Hispanic, and Asian and all other race householders will make up fully 98 percent of all net household growth between 2025 and 2035. This increasing diversity of households will act as a downward force on future homeownership rates because of persistent and large homeownership rate disparities by race/ethnicity. Compared to the homeownership rate of non-Hispanic white households, the homeownership rate of Black households was 28 percentage points lower, the Hispanic homeownership rate was 25 percentage points lower, and the rate for Asian and all other race households was 14 percentage points lower in 2024.

Unlike demographic changes, market changes over the next ten years are generally unpredictable. It is likely that homeownership rates over the next few years will continue to be depressed by ongoing challenging market conditions for homebuyers—namely, high home prices and mortgage interest rates along with low inventories—that show little sign of improving to any significant degree in the near term.

Based on the affordability pressures that have emerged in recent years, we would expect that homeownership rate gains, particularly among young adults, will remain modest, at least in the near term. Meanwhile, middle-aged households are also likely to see only modest improvements at best in homeownership rates as large gains are not common at older ages even when conditions are beneficial.

However, should interest rates decline, the housing supply expand to take pressure off of home prices, and/or the economy remain strong supporting solid growth in incomes, affordability could improve and support gains in homeownership for younger adults more in keeping with historical experience. Ultimately, future changes in market conditions, particularly in interest rates, home prices, and incomes, will exert a strong influence on trends in homeownership. If market conditions vary modestly from their current state, our projections likely reflect a reasonable bound for the homeownership rate. But market conditions may take a wide variety of paths over the next decade that could produce trends outside the bounds of our projections.

With this understanding of the drivers of homeownership trends, we now turn to describing our approach to projecting homeownership over the coming decade.

Data and Methodology

The tenure projection scenarios in this paper build on the Center's most recent household projections (McCue 2025). The 2025 household projections include three scenarios: a main series that relies on the Census Bureau's 2023 main series population projections, and high and low scenarios that employ Census estimates for higher and lower rates of international immigration (US Census Bureau 2023). The tenure projections presented here use the Center's main series of household projections, which provide estimates of the number of households in each race/ethnicity and age group by year. Specifically, we use four categories of race/ethnicity in our analysis: non-Hispanic white, non-Hispanic Black, Hispanic, and non-Hispanic Asian, multiracial, or another race. Hispanic householders may be of any race or may be multiracial.

The tenure projections also use ten-year age groups, from 15–24 to 75 and over. This is a divergence from the Center's household projections, which used five-year age groups, with the change made in order to avoid overly small sample sizes when examining age-race cohorts. While the household projections provide estimates for the next two decades, our tenure projections cover only the ten-year period from 2025–2035. We focus on this shorter span because the uncertainty about market conditions over a longer period makes longer-term projections of homeownership rates highly prone to error.

Assumptions about homeownership rates are derived from current and historic homeownership rates from the US Census Bureau's Current Population Survey (CPS) Annual Social and Economic Supplement via IPUMS-CPS (Flood et al. 2024). The principal alternative to the CPS would be the American Community Survey (ACS). The advantage of the ACS is that it is a much larger annual survey of households that would arguably provide greater accuracy in homeownership rates for the subgroups of

interest by race/ethnicity and age. However, while the CPS annual supplement was introduced in 1947, the ACS was not fully implemented until 2005 and so provides a more limited history of trends in homeownership rates over time to form the basis of our assumptions about likely future trends for specific cohorts.² For similar reasons, the CPS is used to derive headship rates used as an input into the Center’s household projections and so also provides some consistency in data sources between these two analyses.³

Using the CPS data, we calculate homeownership rates for each ten-year age grouping within each race/ethnicity group every year from 1988–2024 and then average across trailing three-year spans to reduce volatility due to sampling. This procedure results in a dataset of lagged three-year average homeownership rates by age and race/ethnicity for years 1990–2024 for use in our analysis.⁴ We then use this dataset to make a set of calculations to measure how homeownership rates changed for each of our specific demographic groups as they aged over ten-year periods. For example, we compare homeownership rates for Hispanic householders aged 25–34 in 1990 with rates for those aged 35–44 (ten years older) in 2000 (ten years later). This provides an estimate of changes in homeownership for a specific birth cohort of Hispanic households as they age from the 25–34-year-old age group to the 35–44-year-old group. We then repeat this calculation for those aged 25–34 in years 1991 (comparing them with 35–44 year olds in 2001), 1992, 1993, etc. and keep repeating until we cover all possible ten-year periods in our dataset through years 2014–2024. This results in a dataset of historical changes in homeownership rates for Hispanic households when aging from 25–34 years old to 35–44 years old. We repeat this for all ten-year age groups within each race/ethnicity category until we have a full set of ten-year changes in homeownership rates.⁵

Using this dataset of historic ten-year homeownership rate changes for each of our cohorts across years 1990–2024—which we refer to as trajectories—we calculate historic average and minimum changes for each age and race/ethnicity category for use in the alternative tenure projection scenarios **(Table 1)**.

² See Flood and Pacas (2017).

³ Despite their many differences in size, sampling and methodology, homeownership rates in these two surveys have followed similar trends over time, although the CPS historically had a somewhat higher homeownership rate. See US Census Bureau, “Homeownership Rate Fact Sheet,” <https://www.census.gov/topics/housing/guidance/homeownership-fact-sheet.html>.

⁴ We exclude data from 2020 due to pandemic-related data quality concerns, and since we are using three-year trailing averages in this age-race cohort analysis, we also exclude estimates from 2021 and 2022.

⁵ Of note, the one exception to this methodology is for the oldest age group, which includes all households age 75 and older and so is not limited to a 10-year age span.

Table 1: Historic Ten-Year Homeownership Rate Trajectories of Cohorts by Age and Race/Ethnicity, 1990–2024

Percentage Point Change in Homeownership Rate

Starting Age / Ending Age	All Households	White	Black	Hispanic	Asian/Another
<i>Average</i>					
15–24 / 25–34	24.8	30.5	12.8	17.4	20.3
25–34 / 35–44	18.8	19.9	18.0	17.1	22.3
35–44 / 45–54	7.1	6.3	9.1	9.9	12.3
45–54 / 55–64	3.3	2.9	3.6	6.6	3.7
55–64 / 65–74	1.3	1.0	3.5	2.0	1.3
65 and Over / 75 and Over	-1.0	-1.3	2.1	1.2	-4.5
<i>Minimum</i>					
15–24 / 25–34	14.4	20.2	3.5	7.1	6.1
25–34 / 35–44	9.5	10.9	7.7	5.6	14.7
35–44 / 45–54	0.6	0.2	0.3	1.6	5.3
45–54 / 55–64	-0.9	-0.7	-2.1	-0.7	-0.2
55–64 / 65–74	-1.3	-1.0	-2.4	-3.8	-8.9
65 and Over / 75 and Over	-3.7	-3.9	-3.0	-5.6	-12.5

Notes: Starting/ending ages are of the same birth cohorts at first measure and then ten years later. White, Black, and Asian/Another race households are non-Hispanic. Hispanic households may be of any race. Asian/Another includes Asian, multiracial, Native American/Alaska Native, Native Hawaiian/Pacific Islander, and any other race.

Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

One important distinction is made in our methodology for estimating future homeownership rates for households under age 25. For this youngest age group, we have to assume a starting homeownership rate rather than a trajectory. For this group we provide two estimates for homeownership rates in 2035. First, for the base case and average-trajectory scenarios, we simply hold rates constant for households under 25 and assume homeownership rates for this age group in 2035 will be equal to rates in 2024. However, since the homeownership rate for this age group in 2024 is well above the historic average, for the low-trajectory scenario we assume rates for households under 25 will revert to their long-run averages by 2035 as a more conservative option.

Three Scenarios for the Tenure Projections

As in the previous Center tenure projections, we provide estimates of future homeownership rates under three scenarios: a base scenario and two alternatives meant to reflect higher and lower trajectories.

The **base scenario** holds current homeownership rates constant by age and race. This allows us to isolate and examine the effect of changing demographics on the projected tenure breakdown of households. In so doing, we can see how rates are affected by the countervailing demographic forces of aging and growing racial and ethnic diversity. However, holding rates constant by age and race implicitly assumes that in ten years the homeownership rates of today's age-race cohorts would equal the current rates of their predecessor cohort, which benefited from favorable market conditions over much of the past decade. Thus, holding rates constant at today's levels may not be realistic given current challenging market conditions for first-time homebuyers.

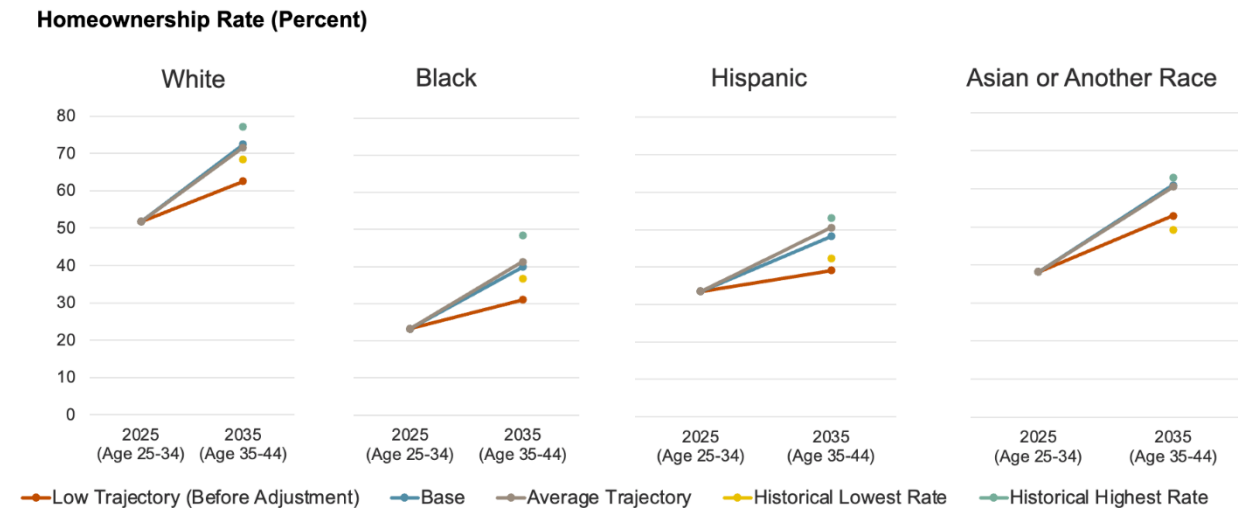
To provide a higher- and a lower-bound estimate we developed two scenarios, one employing the historic average trajectory for each age-race cohort and another that employs historic low trajectories for younger age groups. More specifically, the **average-trajectory** and **low-trajectory** scenarios rely on historic age-race cohort trajectories from 1990–2024 to estimate the magnitude of typical upward or downward shifts in homeownership rates over a ten-year period by age group.

The **average-trajectory scenario** assumes that over the next ten years homeownership rates of each age-race cohort will rise as much as those of previous cohorts did, on average, at the same ages. This scenario takes the average progression in homeownership rates for each age-race cohort by ten-year pairing from 1990–2024 and applies that change to the homeownership rates of each age-race cohort in 2024. For the age 15–24 cohorts in 2035, we have to simply assume a homeownership level since there is no younger cohort to age into this age group. For the average scenario we assume that the same rate as in 2025 will hold. This approach results in a high-rate scenario as homeownership rates have generally increased at above-average rates in recent years, so assuming historic average gains over the next decade would push overall rates even higher, although they would still trail their historic highs from the early 2000s.

Given that current market conditions are making it difficult or prohibitively expensive for young adults to buy homes and become homeowners, our **low-trajectory scenario** applies the lowest progression of homeownership rates from 1990–2024 for the cohorts currently aged 25–34 and 35–44. However, to keep the resulting homeownership rates within the bounds of past experiences, we use a floor of the historically lowest homeownership rate (again from 1990–2024) for each age-race cohort aged 25–34 and

35–44 (**Figure 5**). This scenario is intended to reflect the fact that younger households will face a difficult affordability environment for transitioning into homeownership that may linger over the coming decade. For the cohorts who will be aged 15–24 in 2035, this scenario projects that their homeownership rate will return to their historic averages, which are below current rates for this age group.

Figure 5: Projected Homeownership Rate Trajectories for 25–34 Year Olds by Race/Ethnicity



Notes: White, Black, and Asian/Another race households are non-Hispanic. Hispanic households may be of any race. Asian/Another includes Asian, multiracial, Native American/Alaska Native, Native Hawaiian/Pacific Islander, and any other race.

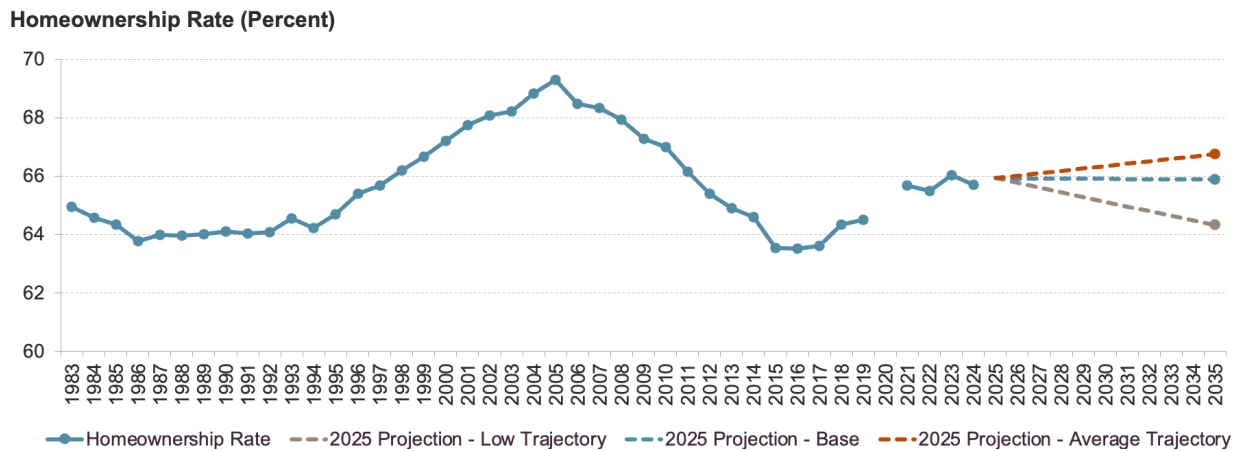
Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

Meanwhile, for age-race cohorts currently aged 45 and older, the low-trajectory scenario again applies the average historic progression in homeownership rates—which is the same assumption for these groups as used in the average-trajectory scenario. The assumption that older households will have a more typical trajectory is motivated by several factors. First, the historical lows for these age cohorts are often negative, reflecting the impact of the foreclosure crisis of a decade ago, and we do not expect market conditions to produce a wave of foreclosures given the relatively strong economy and the significant equity gains these age cohorts have experienced. Second, gains in homeownership at these ages are typically modest and so assuming average gains is fairly conservative.

Projected Changes in Homeownership Rates, 2025–2035

The three projected scenarios result in relatively modest changes in homeownership rates between 2025 and 2035. Changes range from an increase of 0.8 percentage points (to 66.8 percent) under the average-trajectory scenario to a decrease of -1.6 percentage points (to 64.3 percent) under the low-trajectory scenario, with rates unchanged (at 65.9 percent) under the base scenario (**Figure 6**).

Figure 6: Three Projected Scenarios for Homeownership Rates in 2035



Notes: Data for 2020 are excluded due to data quality reasons. Base scenario holds homeownership rates by age and race/ethnicity constant. Average trajectory scenario assumes cohorts follow historical average growth rates as they age. Low-trajectory scenario assumes cohorts younger than 45 years old follow lowest historical homeownership rate trajectories as they age, while older cohorts follow average trajectories.

Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

Table 2 details the results of projecting the homeownership rate under our three scenarios. The **base scenario**—which holds current rates constant for each age-race group—projects that the homeownership rate will remain flat at 65.9 percent from 2025 to 2035. It is noteworthy that under this scenario, rates actually decline for each individual age group even though the overall homeownership rate is flat. Since the scenario holds rates constant by age and race/ethnicity, the decline by age group reflects the growing shares of households of color within each age group because these households all have lower ownership rates than white households. In contrast, each race/ethnicity group experiences increases in homeownership rates over time. This reflects the fact that, in all of these race/ethnicity groups, older households will account for a substantial share of household growth over the next decade, helping to raise the overall homeownership rate because older households have higher homeownership

rates. In short, the base scenario reveals that the demographic shift toward older households will largely offset the shift towards more households of color in influencing the homeownership rate.

Table 2: Projected Homeownership Rates by Scenario

Homeownership Rate (Percent)

	2025	Base Scenario		Average-Trajectory Scenario		Low-Trajectory Scenario	
		2035	2025–2035 Change	2035	2025–2035	2035	2025–2035 Change
Total	65.9	65.9	0.0	66.8	0.8	64.3	-1.6
Age of Householder							
Under 25	24.4	24.3	0.0	24.3	0.0	19.4	-5.0
25–34	42.6	42.1	-0.5	48.3	5.7	38.5	-4.1
35–44	62.2	61.3	-0.9	61.5	-0.7	56.5	-5.7
45–54	70.5	70.2	-0.3	70.2	-0.3	70.2	-0.3
55–64	75.4	74.3	-1.2	74.3	-1.1	74.3	-1.1
65–74	78.9	77.7	-1.2	76.9	-2.0	76.9	-2.0
75 and Over	77.7	77.1	-0.6	77.5	-0.2	77.5	-0.2
Race/Ethnicity							
White	74.4	75.0	0.5	75.2	0.8	73.6	-0.8
Black	46.6	48.3	1.6	48.2	1.6	45.8	-0.8
Hispanic	49.5	50.4	0.9	53.7	4.3	49.5	0.1
Asian/Another	60.0	60.7	0.7	62.2	2.2	57.8	-2.2

Notes: White, Black, and Asian/Another race householders are non-Hispanic. Hispanic householders may be of any race. Asian/Another includes Asian, multiracial, Native American/Alaska Native, Native Hawaiian/Pacific Islander, and any other race.

Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

The **average-trajectory scenario**—which applies the average progression in historic homeownership rates to each age-race cohort—projects that homeownership rates will rise from 65.9 percent in 2025 to 66.8 percent in 2035. The increase is driven largely by significant gains among households age 25–34, whose rate is projected to jump by 5.7 percentage points. Even in the average-trajectory scenario, all older age groups starting at age 35 are still projected to experience declining

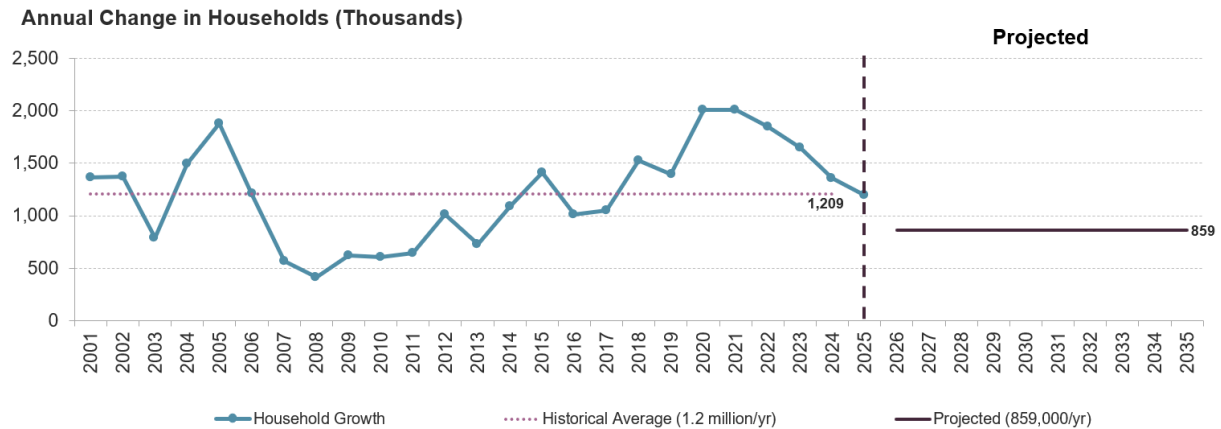
rates, due to the growing share of households of color. Looking at rates by race/ethnicity, once again all groups experience increases due to the growing share of older households, but the gains are largest among Hispanic and Asian/Another households due to their larger share of young households.

Lastly, the **low-trajectory scenario**—which applies the average progression in homeownership rates to cohorts aged 45 and over but the lowest progression to younger cohorts—projects that the aggregate homeownership rate will fall from 65.9 percent in 2025 to 64.3 percent in 2035. Rates decline for white, Black, and Asian/Another households in this low-trajectory scenario, and increase by only a modest 0.1 percentage points for Hispanic households. Per the scenario’s design, the largest decreases in homeownership rates are among adults aged under 45, which range from 4.1 to 5.7 percentage points. The large declines in younger adult homeownership in this scenario drive the declines in the overall homeownership rate, although older households also experience declining rates in keeping with the average-trajectory scenario due to the rising share of households of color.

Projected Changes in Homeowner and Renter Households, 2025–2035

While the homeownership rate is an important indicator of the relative demand for owner- and renter-occupied housing, it is also important to consider the absolute magnitude of growth in the number of owner and renter households under each of these scenarios. An important factor to note is that the Center’s main household projection for 2025–35 calls for a substantial slowdown in household growth compared to recent decades. Specifically, household growth is projected to average 859,000 per year over the coming decade, compared to the historical average growth level since 2000 of 1.2 million per year (**Figure 7**). Thus, growth in overall housing demand is projected to decline substantially over the coming decade under all three of our scenarios compared to recent decades.

Figure 7: Past and Projected Annual Change in Households 2025–2035

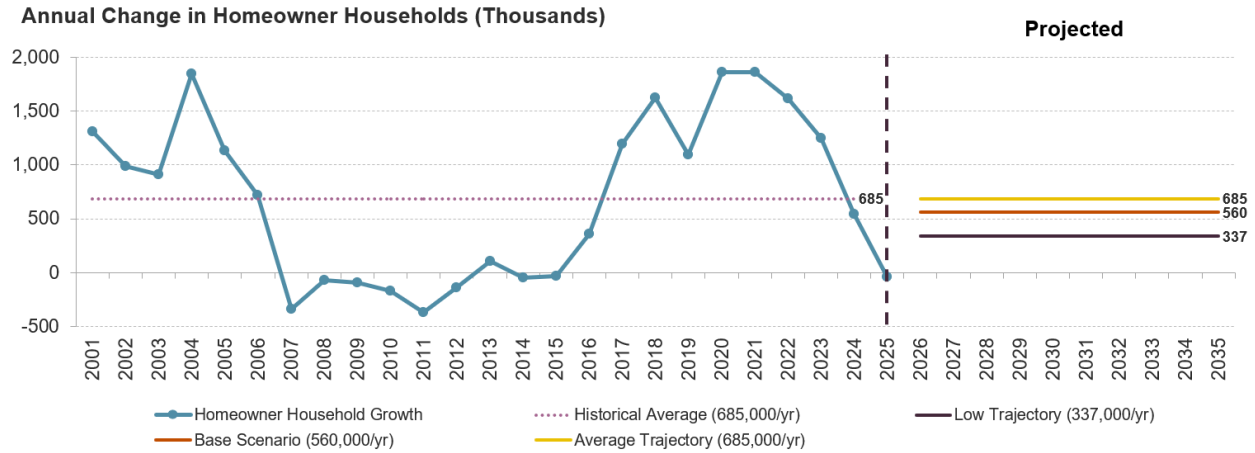


Notes: Historical average is for the period from year 2000 to 2025. Annual change in 2025 is the year-over-year change in the second quarter.

Source: JCHS tabulations of US Census Bureau, Housing Vacancy Surveys and JCHS Household Projections (McCue 2025).

The different projected homeownership rate changes across the three scenarios result in substantial variation in the estimated changes in the number of owner and renter households. Under the base scenario where the overall homeownership rate holds steady, future household growth is divided between owners and renters in proportion to the homeownership rate, resulting in a ten-year gain of 5.6 million owner households and just under 3.0 million renter households, or 560,000 and 299,000 respectively on an annual basis. Both owner and renter growth levels are therefore projected to be well below historical averages. This level of growth in homeowner households is 18 percent below the 685,000 average annual homeowner growth level in 2000–2025 (**Figure 8**). Meanwhile, projected growth in the number of renter households under this scenario is 43 percent below the 524,000 annual average growth level in 2000–2025 (**Figure 9**).

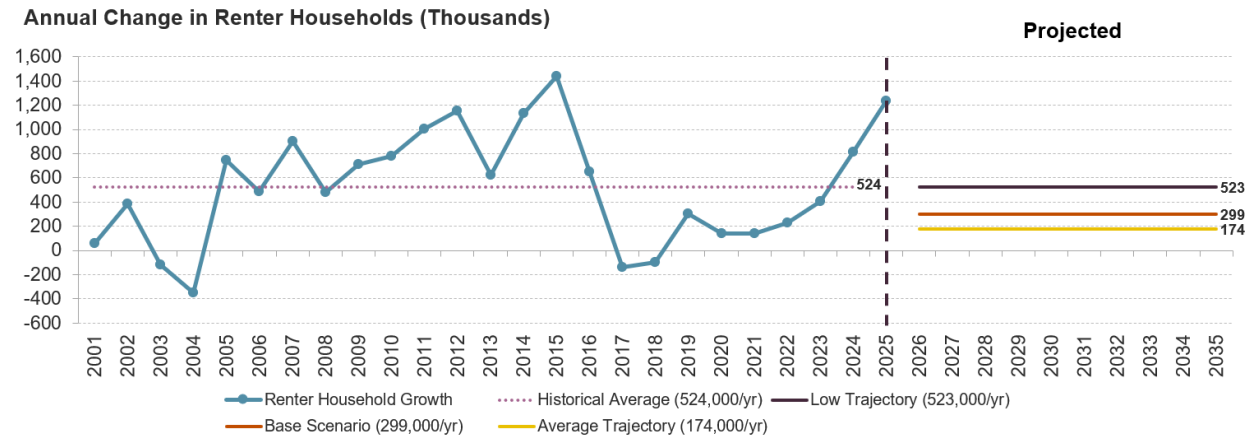
Figure 8: Past and Projected Annual Change in Homeowner Households, 2025–2035



Notes: Historical average is for the period from year 2000 to 2025. Annual change in 2025 is the year-over-year change in the second quarter.

Source: JCHS tabulations of US Census Bureau, Housing Vacancy Surveys, Current Population Surveys via IPUMS-CPS, and JCHS Household Projections (McCue 2025).

Figure 9: Past and Projected Annual Change in Renter Households, 2025–2035



Notes: Historical average is for the period from year 2000 to 2025. Annual change in 2025 is the year-over-year change in the second quarter.

Source: JCHS tabulations of US Census Bureau, Housing Vacancy Surveys, Current Population Surveys via IPUMS-CPS, and JCHS Household Projections (McCue 2025).

As these results indicate, even relatively small swings in the overall homeownership rate can have a fairly substantial impact on the projected growth in owner and renter households. For example, if the homeownership rate rises to 66.8 percent as projected under the average-trajectory scenario, homeowners would account for 80 percent of all household growth over the 2025–35 period; the number of homeowner households would increase by 685,000 per year—22 percent more than in the base scenario—while renter households would increase by only 174,000—42 percent less than in the

base scenario. These average annual gains in homeowner households would be roughly equal to the historical average gains in 2000–2025, but, in contrast, average annual renter household growth would be one-third of the historical average annual growth in renter households in 2000–2025.

Finally, under the low-trajectory scenario, growth in homeowner households would average only 337,000 per year over the ten-year period, or roughly half of the historical average annual growth from 2000–2025. Meanwhile, growth in renter households would average 523,000 per year during this period, which would be roughly equal to the historical average annual renter growth rate from 2000–2025.

Thus, while the variation in the overall homeownership rate is not substantial, the three scenarios project very different outlooks for growth in owner- and renter-occupied housing. Reflecting lower overall household growth in the Center’s 2025 household projections, the base scenario calls for a fairly substantial reduction in demand growth for both tenures compared to the average since 2000. In comparison, the average-trajectory scenario calls for owner-occupied demand to grow in line with the average growth level from the last twenty-five years but for rental demand to see a substantial falloff. Finally, under the low-trajectory scenario, owner-occupied demand would be very weak while growth in rental demand would equal the average level from the last twenty-five years.

Projected Changes in Homeowner and Renter Households by Age and Race/Ethnicity, 2025–2035

Households in the oldest age groups will dominate changes in both owners and renters under each scenario, while growth by tenure among younger age groups will be smaller and will differ substantially depending on the homeownership-rate scenario.

Older adult households will be the greatest source of growth in both owners and renters, largely because households headed by people aged 75 and over are projected to increase by 7.5 million overall in 2025–2035—far exceeding the growth of any other age group. Growth by tenure for this age group is also very similar in each of the scenarios. Under each of the scenarios, the number of homeowners aged 75 and over will increase by between 5.7 million and 5.8 million households in 2025–2035, while renters in this oldest age group will increase between 1.7 million and 1.8 million (**Table 3**).

Table 3: Projected Changes in Households by Age and Race/Ethnicity in 2025–2035

Change in Households 2025–2035 (Thousands)

Age	All Households	Base Scenario		Average-Trajectory Scenario		Low-Trajectory Scenario	
		Homeowners	Renters	Homeowners	Renters	Homeowners	Renters
Total	8,592	5,601	2,991	6,854	1,738	3,366	5,226
Under 25	-469	-115	-353	-115	-353	-392	-77
25–34	1	-105	105	1,165	-1,164	-834	835
35–44	911	348	563	393	518	-819	1,730
45–54	2,069	1,377	691	1,383	685	1,383	685
55–64	-1,789	-1,601	-188	-1,589	-200	-1,589	-200
65–74	376	24	352	-155	530	-155	530
75 and Over	7,493	5,674	1,820	5,772	1,722	5,772	1,722
<i>Under 45</i>	<i>443</i>	<i>128</i>	<i>315</i>	<i>1,442</i>	<i>-999</i>	<i>-2,045</i>	<i>2,488</i>
<i>65 and Over</i>	<i>7,869</i>	<i>5,697</i>	<i>2,172</i>	<i>5,617</i>	<i>2,252</i>	<i>5,617</i>	<i>2,252</i>
Race/Ethnicity							
White	147	568	-421	815	-668	-604	751
Black	1,606	1,060	546	1,045	561	599	1,007
Hispanic	4,234	2,317	1,917	3,128	1,106	2,109	2,125
Asian/Another	2,605	1,656	948	1,866	739	1,262	1,342

Notes: All numbers are in thousands. White, Black, and Asian/Another householders are non-Hispanic. Hispanic householders may be of any race. Asian/Another includes Asian, multiracial, Native American/Alaska Native, Native Hawaiian/Pacific Islander, and any other race.

Source: JCHS tabulations of US Census Bureau, Current Population Surveys via IPUMS-CPS, University of Minnesota.

After older adults, the next highest source of growth will be from the combined growth of households aged 35–44 and 45–54, which together will rise by a substantial 3.0 million households in 2025–2035 due to the influence of the millennial generation. Growth by tenure for this age group is similar under the base and average-trajectory scenarios, but significantly different in the low-trajectory scenario. Under the base and average-trajectory scenarios, the number of homeowner households aged 35–54 will increase by 1.7 million and 1.8 million, respectively, while the number of renter households

of this age group will increase by 1.3 million and 1.2 million, respectively. Under the low trajectory, however, homeowner growth for this age group drops to 0.6 million while growth in renter households jumps to 2.4 million.

In contrast, the number of households age 55–64 is projected to decline by 1.8 million overall in 2025–2035 as the smaller Gen X follows the baby boom into this age group. Under each scenario, most of the decline in the 55–64-year-old group will be from homeowners, with a 1.6 million decline in homeowner households in that age group and a 0.2 million decline in similarly aged renter households.

The average-trajectory and low-trajectory scenarios produce some substantial swings in projected growth in owner and renter households relative to the base scenario. Much of the variation is among households under age 45 as the average- and low-trajectory scenarios result in much greater swings in homeownership at these ages. For example, while the base scenario projects the number of homeowner households under age 45 to increase by 128,000 between 2025 and 2035, the average-trajectory scenario projects the number of homeowners in this group to increase by fully 1.44 million during this time, while the low-trajectory scenario projects a decrease of 2.05 million; the average- and low-trajectory scenarios thus differ by 3.5 million in their projections for the growth in young adult homeowners. These differences in projected homeowner growth would be complemented by equal differences in projected renter household growth going in the opposite direction. Clearly, what seem to be small differences in projected overall homeownership rates can have a profound impact on the number of young owners and renters.

In terms of race/ethnicity, virtually all of the net increase in households overall in 2025–2035 will be accounted for by households of color (98 percent), with Hispanics accounting for nearly half (49 percent) of total household growth, Asian/Another households accounting for another 30 percent and Black households accounting for the remaining 19 percent. White households will increase by only 147,000, or 2 percent of total household growth, as mortality among baby boomers will offset growth from births and immigration.

The significant share of growth attributed to households of color is similarly reflected in the number of owner and renter households. Reflecting their importance to overall household growth, under the base scenario Hispanic homeowners will increase by 2.3 million in 2025–35, representing 41 percent of all homeowner growth, while Hispanic renter households will increase by 1.9 million, making up fully 64 percent of all renter growth. Asian/Another and Black households will make significant contributions to both owner and renter household growth roughly in keeping with their share of overall

household growth. Non-Hispanic white households, in contrast, will provide a positive contribution of 568,000 to owner growth but will pull down renter households by 421,000.

The average- and low-trajectory scenarios also differ significantly in their projections for the growth in homeowner and renter households by race and ethnicity. The largest differences are between projections for Hispanic and non-Hispanic white households. Specifically, the low-trajectory scenario would lead to 1.2 million fewer additional white homeowners relative to growth under the base scenario, but only 200,000 fewer additional Hispanic homeowners. As a result, the Hispanic share of homeowner household growth would rise relative to the base scenario (from 41 percent to 63 percent), while the white share of homeowner household growth would fall (from 10 percent to -18 percent). At the same time, the white share of renter household growth would rise relative to the base scenario under the low-trajectory scenario (from -14 percent to 14 percent), while the Hispanic share of renter household growth would fall (from 64 percent to 41 percent).

The average-trajectory scenario would have more modest changes in the racial/ethnic composition of owners and renters relative to the base scenario. The largest change is an increase in Hispanic homeowners of 800,000 (along with a parallel decline in Hispanic renters), raising the Hispanic share of all homeowner growth from 41 to 46 percent. White and Asian/Another households would see a gain in homeowners of roughly 200,000, while there would be little change in Black households by tenure.

Summary of Findings

Building on the Center's recent household projections, this paper outlines three potential scenarios for how the growth in housing demand will be divided between owning and renting. The scenarios represent three distinct paths: a base scenario where the overall homeownership rate changes little, an average-trajectory scenario for homeownership rates for each age/race-ethnic cohort that results in a modest increase in the overall homeownership rate, and a low-trajectory scenario, where households under age 35 see limited gains in homeownership going forward in light of today's affordability challenges, that results in a modest decline in the overall homeownership rate.

Across these three scenarios, the projected homeownership rate in 2035 ranges from a low of 64.3 percent to a high of 66.8 percent. This 2.5 percentage point difference does not seem particularly substantial compared to the 5.0 percentage point drop in homeownership rates between 2006 and 2016 or the subsequent 2.5 percentage point increase between 2016 and 2023. However, given that the Center's household projections already call for much lower levels of household growth overall in the

next decade, this range still results in alternative scenarios with historically low growth in demand for either owner or renter housing.

The low underlying level of overall household growth projected for 2025–2035 is reflected in modest levels of growth projected for both homeowner and renter households under all scenarios. For homeowners, average annual growth in 2025–2035 is projected to range from a low of 337,000 in the low-trajectory scenario to a high of 685,000 in the average trajectory scenario, with the base scenario in between at 560,000. The highest of these scenarios (the average-trajectory scenario) projects a rate of growth roughly equal to the historical average annual growth level for 2000–2025, while the base and low-trajectory scenarios project annual homeowner growth levels that are 18 percent and 51 percent below this recent historical average, respectively.

The outlook for growth in rental demand is also modest under all but the low-trajectory scenario. Under the base scenario, annual growth in renters would be 299,000, which is significantly less than the 524,000 historical average growth in renter households from 2000 to 2025. The average-trajectory scenario, which projects the highest increase in homeownership rates, would see the sharpest falloff in renter household growth, averaging just 174,000 annually, or 67 percent lower than the average for 2000–2025. However, the low-trajectory scenario would result in renter household growth of 523,000 annually, making it the only scenario under which renter growth remains roughly equal to the average growth from 2000–2025.

In terms of the age composition of the growth in owners and renters, under all three scenarios households over age 75 will dominate the growth in both homeowners and renters, as baby boomers will account for the vast majority of net household growth overall. Still, aging millennials will contribute substantial growth in middle-aged owner and renter households age over the coming decade. While there will be little overall growth in households under age 45, the average- and low-trajectory scenarios differ enormously in their projections for growth rates in owner and renter households in these age cohorts, which have historically experienced the greatest swings in homeownership rates. It is no exaggeration to conclude that the future path of homeownership depends largely on whether these younger households transition into homeownership at rates similar to the historical average or, because of today's affordability challenges, at substantially lower rates.

The other significant aspect of the Center's household projections that is reflected in the outlook for owner and renter household growth is that almost all of the net gains in households will be among people of color, with Hispanics alone accounting for nearly half of all household growth. As a result, the growth in owner and renter households is also predominantly among Hispanics and to a

lesser extent Asian/Another and Black households. White households will experience only modest growth overall. Given that Hispanic and Asian/Another households are younger on average than white and Black households, the average- and low-trajectory scenarios differ more widely for them in their projections for the numbers of owner and renter households.

It is important to highlight that projecting future homeownership trends is challenging, as changes in market conditions can have a profound influence on household tenure choices. The three scenarios presented are intended to provide a lower and upper range for trends that are most likely given historical experience and current market conditions. Much of the variation reflected in these scenarios is driven by changes in the age and racial/ethnic composition of households. More significant changes in interest rates, home prices and household incomes would easily push homeownership rate trends outside of the range presented in this paper. The projections presented here are perhaps most helpful in understanding how more predictable changes in the demographic profile of households are likely to influence homeownership rates in times of modest changes in market conditions. Along these lines, it is noteworthy that under the base scenario the influence of an aging population in pushing up the overall homeownership rate is essentially offset by the influence of the increased racial/ethnic diversity of households in pushing down the overall homeownership rate due to longstanding and persistent disparities in homeownership by race. Since the ownership rates of older households are subject to less variation, which of these scenarios will come to pass will depend largely on how young adults—and particularly households of color—fare in the housing market.

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Sec. 28-204. Accessory dwelling units.

Accessory dwelling units (ADUs) may be incorporated within or added onto an existing house, garage, or other accessory structure, or may be built as a separate structure on a lot where a single-family dwelling exists in the R-1 through R-4 residential districts of the city.

Unless specifically addressed in this section, ADUs are subject to the regulations of the underlying zoning district in regards to lot and bulk standards (e.g., height, setbacks, and pervious coverage requirements), and the Minnesota State Building Code for residential structures.

In keeping within the character and standards of single-family residential districts of the city, the following standards shall apply:

- (1) Occupants of ADUs shall be limited to members of the family of the owner(s) of the principal structure.
 - (2) No rental of the ADU's will be allowed.
 - (3) No conversion of a single family house into a duplex will be allowed.
 - (4) If a home is converted into a rental property, the ADU shall be removed.
- (a) *Types of permits required.*
- (1) Allowed with the issuance of an ADU permit:
 - a. Internal ADUs incorporated within an existing principal structure shall be permitted in the R-1 through R-4 districts.
 - b. Detached ADUs shall be permitted on lots in the R-1 and R-2 residential districts that contain a minimum of two acres of contiguous land.
 - c. Attached ADUs shall be permitted on lots in the R-1 and R-2 Districts that contain a minimum of two acres of contiguous land.
 - (2) Allowed pursuant the approval of a conditional use permit:
 - a. Detached ADUs in the R-3 through R-4 Residential Districts, or on lots smaller than two acres, shall require the issuance of a conditional use permit subject to the standards of this development code.
 - b. Attached ADUs in the R-3 through R-4 residential districts, or on lots smaller than two acres, shall require the issuance of a conditional use permit subject to the standards of this development code.
- (b) *Property standards.*
- (1) ADUs shall only be permitted in residential districts when the property owner lives on the property within the principal dwelling.
 - (2) Only one ADU shall be allowed per single-family lot.
 - (3) ADUs shall be located on the same parcel as the principle dwelling. ADUs located on back lots are prohibited.
 - (4) ADUs shall remain under the ownership of the principal structure's occupant, and may not be sold separately or used as rental property.
 - (5) ADUs shall not be subdivided or result in the creation of a separate tax parcel.

-
- (6) ADUs shall be prohibited on residential lots in which the permitted use of the principal structure is greater than a single-family use. This includes, but is not limited to, duplex units, twin homes, triplex units, quad units, residential facilities, etc.
 - (7) Home occupations are prohibited uses for ADUs in all zoning districts.
- (c) *Design standards.*
- (1) *Minimum/maximum size.* The maximum size of an ADU may be no more than 50 percent of the square footage of the principal dwelling unit or 800 square feet, whichever is less.
 - (2) *Setbacks.* The ADU must abide by the regular accessory structure setbacks.
 - (3) *Height.* The height of the ADU shall not exceed that of the principle structure.
 - (4) *Architectural design.* Attached ADUs added to the principal structure or to an existing accessory structure shall be designed to maintain the architectural design, style, appearance and character of the main building.
 - (5) *Parking.* Parking requirements shall be established by the council for ADUs that require approval of a CUP, and the planning director shall determine parking requirements for permitted ADUs on a case-to-case basis.
 - (6) Conversion of an existing structure to an ADU shall only occur if the existing structure meets all other zoning standards (setbacks, height, impervious, SSTS compliance).
 - (7) All ADU structures shall be attached to a continuous load bearing permanent perimeter foundation that meets the requirements of the State Building Code (skirting is not an allowable substitute).

(Ord. No. 199, 3rd series, § 1, 11-6-2023)

ARTICLE IV. - LOT SIZE AND BULK REGULATIONS

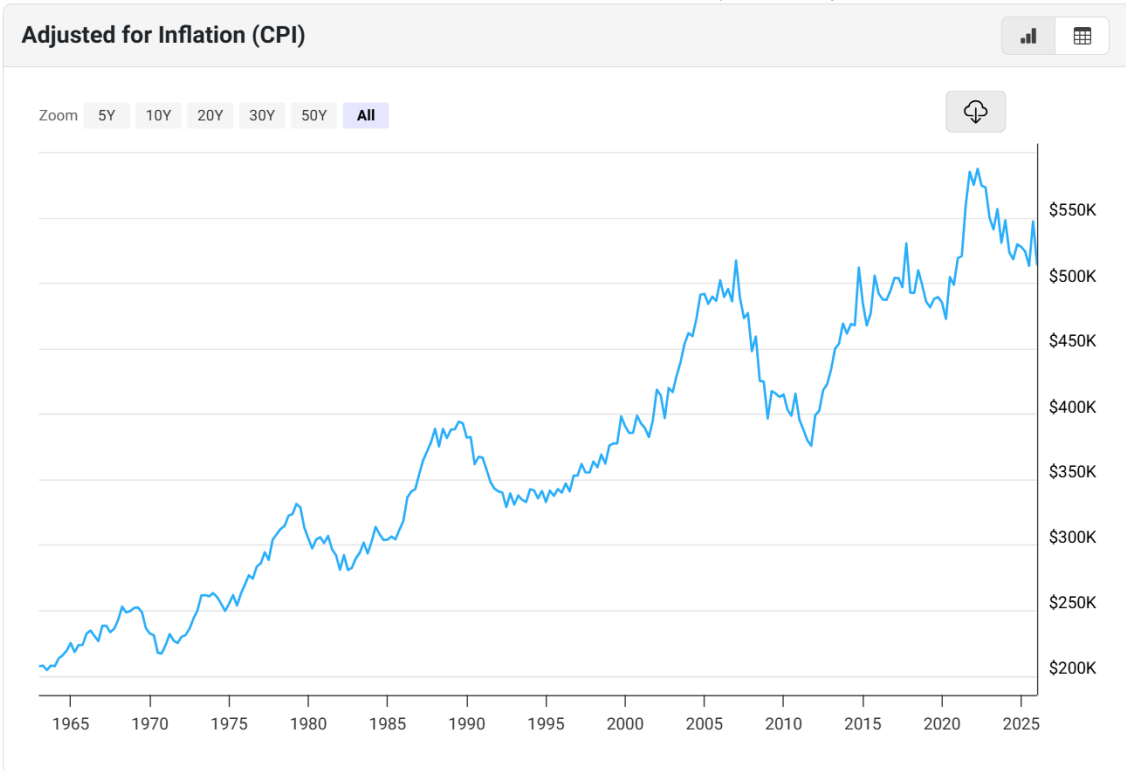
Sec. 28-121. - Minimum lot size and bulk requirements.

(c) Standards for single and two family principle dwellings. The following standards shall apply to all single and two family dwelling units, unless specifically exempted:

- (1) All single and two family principle dwellings shall have a minimum livable floor area of 800 square feet per unit.
- (2) All single and two family dwellings shall be attached to a continuous load bearing permanent perimeter foundation that meets the requirements of the State Building Code (skirting is not an allowable substitute), except mobile homes in a mobile home park.
- (3) All single and two family principle dwellings, except mobile homes in a mobile home park, shall have a minimum width of 20 feet.

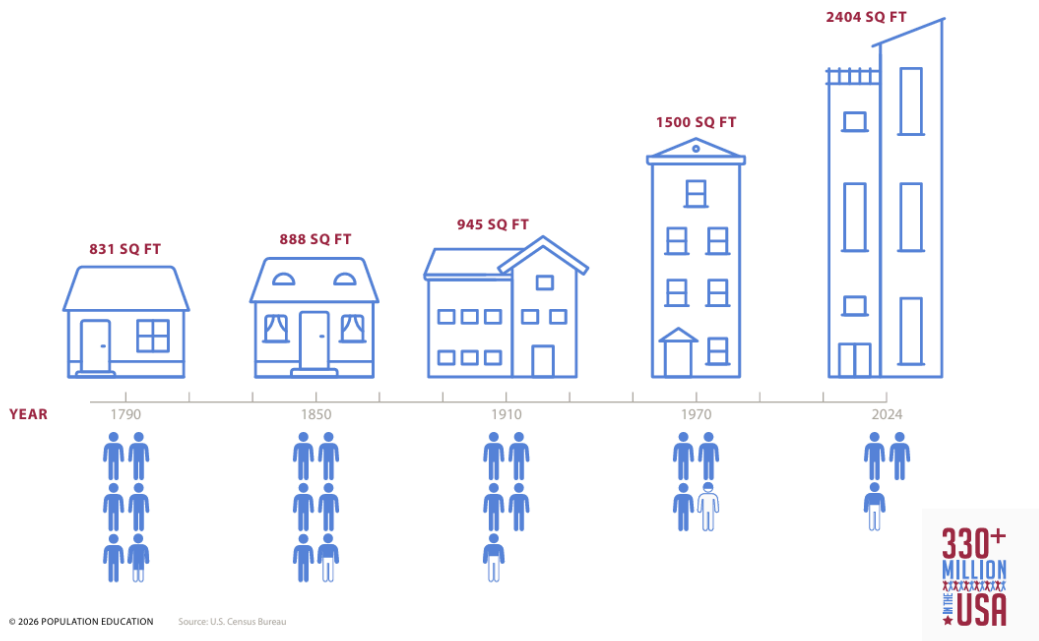
2026 FEE SCHEDULE Effective January 1, 2026

Use Permits:	
CUP (Conditional Use Permit)	\$500.00 *
- Escrow (minimum)	\$500.00
IUP (Interim Use Permit)	\$500.00
- Escrow (minimum)	\$500.00
Variance	\$500.00 *
- Escrow (minimum)	\$500.00
Zoning Amendment	\$600.00
- Escrow (minimum)	\$500.00
PUD/CIC Concept Approval (Fee is for each review.)	\$250.00
- Escrow (minimum)	\$500.00
PUD/CIC	\$1,500.00 + \$25.00/lot or unit
- Escrow (minimum)	\$2,500.00
PUD/CIC (no public improvements)	\$800.00 + \$25.00/lot or unit
- Escrow (minimum)	\$1,500.00
Home Occupation (Type II)	\$125.00
Farm License Initial	\$50.00
Farm License Renewal	\$25.00
Construction Use Permits:	
Temporary Moveable Storage Container / Semi-Trailer Annual License (see Ordinance for allowed zoning districts)	\$150.00 per container/trailer
Land Use (Determined by Planning Director)	\$500.00 minimum
Fence Permit	\$25.00



-U.S. Home Prices (1963-2026) <https://www.macrotrends.net/3016/us-home-prices>

Average House and Household Size in the U.S.



-U.S. Census Bureau

Article XI SUBDIVISIONS AND PLANNED UNIT DEVELOPMENTS, Sec. 28-471. —
Subdivisions of Land, (f) Tiny House Subdivision

(f) **Tiny house subdivision.** Tiny house subdivisions will consist of individual dwelling structures 150 to 800 square feet. The purpose of small lot subdivision is to encourage affordable housing, infill development and sustainable practices. All PUD and subdivision standards shall apply to tiny home subdivisions. Additional standards are required as follows:

- (1) Tiny house subdivisions may only be approved with the review and approval of a PUD/CUP.
- (2) Tiny house subdivisions can occur in R-1, R-2, R-3, R-4, R-5 zoning districts.
- (3) The density of a tiny house subdivision will be no more than one and one-half times the underlying zoning.
- (4) Small lot subdivisions are not condominiums, multi-family, mobile homes or recreational vehicles. Properties are titled in fee simple.
- (5) Small lot homes must be structurally independent, with no shared foundations or common walls.
- (6) Small lots may be irregularly shaped, a minimum area of 600 square feet, and at least 16 feet wide.
- (7) There are no yard or setback requirements along alleys, streets, or between lots within the approved subdivision.
- (8) Fifty percent open space is required.
- (9) Design of structures must be approved by the planning board.
- (10) Appropriate water, waste water and other utilities will be provided. These standards will fall in line with MN Building Code and the city SSTS Zoning development code.

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[Xerces Society](#) - [Events](#) - Minnesota Bumble Bee Atlas Field Training - Bemidji, MN

Minnesota Bumble Bee Atlas Field Training - Bemidji, MN

Aug 8

10:00 AM – 12:00 PM CT

1001 30th St NW, Bemidji, MN 56601

This event will not be recorded.

Bemidji, MN

Join the Bumble Bee Atlas for a field day at North Country Park! In-person training events are a great way to learn how to use your insect net, collect data according to project methods, practice identifying and photographing bees, and meet fellow participants. Registration is required to attend, so be sure to sign up.

This event will take place outdoors. During the first hour of this event, we will be collecting bees from the pollinator garden. During the second hour, we will gather around tables to practice bee ID. Boots or close-toed shoes, long pants, sunscreen, and insect repellent are recommended.

[Learn more and register here today!](#)



Genevieve Pugesek - Endangered Species Conservation Biologist, Midwest Bumble Bee Atlas - Xerces Society.

To request a reasonable accommodation or for inquiries about accessibility, please contact outreach@xerces.org.

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