GEORGETOWN CLIMATE CENTER

Local Ordinances for Climate Adaptation & Mitigation | Oct. 2025

Local Ordinances to Facilitate Medium- and Heavy-Duty Zero Emissions Vehicle Deployment

The Opportunity

Transitioning away from fossil fuels to electricity as the primary fuel for medium-and heavy-duty vehicles (MHDVs) — including the trucks and tractor-trailers that deliver goods over highways and roads — is a critical measure to reduce harmful climate pollution from the transportation sector in the United States. These MHDVs serve an important function, delivering everything from food and consumer goods to raw materials needed for manufacturing and industrial production. At the same time, although MHDVs account for only 5 percent of total vehicles on the road in the United States, they contribute 21 percent of greenhouse gas (GHG) emissions from transportation.[1] Battery electric MHDVs produce significantly lower levels of GHG pollution,

[1] U.S. Dept. of Energy & U.S. Environmental Protection Agency, A Report on Action for MHDV Energy and Emissions Innovation, Dec. 2024, https://www.energy.gov/sites/default/files/2025-01/MHDV-Report-Actions-2024-12-19.pdf.

even considering emissions from electricity generation needed to charge the batteries. For example, an electric delivery truck in Connecticut provides an 86 percent reduction in GHG emissions compared to a diesel equivalent.[2] These vehicles are also a significant source of local air pollutants,[3] which typically affect low-income and frontline communities disproportionately.

Many states have already implemented important policies and programs to accelerate the deployment of medium- and heavy-duty zero emission vehicles (MHD ZEVs or "ZEV freight trucks"). These state actions include establishing vehicle deployment targets, which are set out in the Multi-state Medium- and Heavy- duty Zero Emission Vehicle Memorandum of Understanding, signed in June 2020.[4] In addition, states are currently implementing grant programs to provide funding for vehicles and infrastructure.[5]

While these steps reflect substantial progress, a significant barrier to deploying ZEV freight trucks remains — namely, a lack of publicly available charging infrastructure that can serve these large vehicles. While private, depot-based charging for MHD ZEVs (for example, charging equipment “behind the fence” of a private business only used by that business) is feasible for large fleet operators, such as a big fleet of moving trucks under common ownership, it is insufficient to enable widespread electrification. This is particularly true for small and independent truck operators. Challenges for small fleets include high capital costs for constructing a private charging depot, the use of short-term leases by many truck operators, complex issues related to electric utility investments and rate structures, and maintenance and

[2] The estimate is based on analysis from the Union of Concerned Scientists. The modeled scenario compares GHG emissions for model year 2023 electric delivery truck with a model year 2023 diesel truck. Union of Concerned Scientists, Clean Truck Comparisons Map, “No Matter Who’s in Office, the Choice for Cleaner Trucks Is Obvious” (2024) https://blog.ucs.org/dave-cooke/no-matter-whos-in-office-the-choice-for-cleaner-trucks-is-obvious/.

[3] Environmental Defence Fund, Making the Invisible Visible: Shining a Light on Warehouse Truck Air Pollution (2023), https://www.edf.org/media/edf-report-air-pollution-warehouse-trucks-places-unequal-burden-communities-color-and-areas.

[4] Multi-state Medium- and Heavy- duty Zero Emission Vehicle Memorandum of Understanding (2020), https://www.nescaum.org/documents/mhdv-zev-mou-20220329.pdf.

[5] *See* “New York Truck Voucher Incentive Program (NYTVIP)”, New York State Energy Research and Development Authority (NYSERDA), https://www.nyserda.ny.gov/All-Programs/Truck-Voucher-Program/About-NYTVIP; “Medium- and Heavy-Duty Battery Electric Vehicle Demonstration Project”, Efficiency Maine https://www.efficiencymaine.com/pon-em-006-2025/; Clean Corridor Coalition (“a multi-state effort to deploy medium- and heavy-duty zero-emission vehicle charging infrastructure for freight electrification along the I-95 corridor and adjacent roads from Connecticut to Maryland”), https://dep.nj.gov/drivegreen/cprg-ccc/

upkeep of charging stations. Even for large fleets, a network of publicly accessible truck charging hubs can increase the range of electric travel and can enable companies to more quickly transition truck routes to ZEVs. States across the country are recognizing that providing funding and other incentives for these publicly accessible truck charging hubs is an important policy tool to accelerate vehicle electrification and reduce climate-warming pollution.[6]

Another significant challenge delaying and limiting the installation of charging stations for ZEV freight trucks is lengthy and unclear local permitting and zoning processes for truck charging stations.[7] Researchers have consistently highlighted that outdated, ambiguous, or overly restrictive local zoning codes and permitting requirements can delay or even deter the development of electric truck charging stations.[8] A 2024 report from the U.S. EPA and U.S. Department of Energy identified "streamlining and standardizing permitting processes" as a key strategy for enabling electric freight truck deployment.[9]

Because they hold responsibility for zoning and permitting of EV charging infrastructure, local governments can play a very important role in ensuring the success of MHDV electrification. In two exceptional cases — California and New Jersey — state legislation sets out minimum permitting requirements that local governments must follow, with the goal of streamlining the process for charging station installation.[10] However, in most states, no similar statewide framework exists. Even in a state with a statewide framework, local governments would still play a critical role, as local jurisdictions are ultimately responsible for adopting and implementing EV infrastructure zoning and permitting ordinances.

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[6] See, for example, California Department of Transportation, "Caltrans Charges Ahead on Powering a West Coast Zero-Emission Truck Corridor with $102 Million in Federal Funds" (2024), https://dot.ca.gov/news-releases/news-release-2024-033; New Jersey Department of Environmental Protection, Clean Corridor Coalition, https://dep.nj.gov/drivegreen/cprg-ccc/

[7] In California, cities and counties are required to adopt streamlined permitting procedures for electric vehicle charging stations, including a streamlining ordinance and checklist. In New Jersey, municipalities are required to promote the installation of EV charging stations in their municipal master plans. *Id.*

[8] *See* U.S. Dept. of Energy & U.S. Environmental Protection Agency, A Report on Action for MHDV Energy and Emissions Innovation, Dec. 2024, https://www.energy.gov/sites/default/files/2025-01/MHDV-Report-Actions-2024-12-19.pdf.

[9] Other infrastructure strategies recommended in the report include updating utility regulatory frameworks and enabling innovative business models for truck charging depots. *See* U.S. Dept. of Energy & U.S. Environmental Protection Agency, A Report on Action for MHDV Energy and Emissions Innovation, Dec. 2024 at 60 https://www.energy.gov/sites/default/files/2025-01/MHDV-Report-Actions-2024-12-19.pdf.

[10] *See* California Government Code § 65850.7 and § 65850.7; New Jersey Statutes 40:55D-28, 40:55D-89, and 40A:12A-7.

Charging stations for medium- and heavy-duty vehicles differ from those for light duty vehicles like passenger cars and trucks. Best practices and resources for streamlining the processes of zoning, siting, and permitting charging stations for zero-emission "light-duty vehicles" such as passenger cars are widely available and have been adopted in many local jurisdictions, although funding and siting these charging stations is still ongoing. However, ordinances and best practices for light duty vehicles generally do not account for the unique considerations and challenges presented by MHDZEV freight truck charging stations. These truck charging stations differ significantly from both passenger car EV charging stations and traditional truck parking or freight logistics sites. Compared to passenger EV stations, MHDZEV stations serve larger vehicles and bring with them truck traffic and noise, require significantly higher electric power capacity, and are designed primarily for commercial operators. Unlike conventional freight or truck stops, MHDZEV charging facilities do not store diesel fuel or generate tailpipe emissions, but do involve much higher power electrical infrastructure and complex site design requirements. As a result, these facilities do not fit neatly into existing permitting processes developed for other use cases.

A set of best practices for permitting MDHZEV charging facilities is beginning to emerge based on experiences in jurisdictions that have facilitated the early deployment of ZEV freight trucks. Given industry commitments and technology developments, the deployment of electric trucks has an opportunity to grow significantly over the coming five to ten years.[11] Many states have also made ambitious state-level commitments to reduce climate and other air pollution by electrifying the freight trucks operating in their states, and have policies and programs in place to promote the deployment of trucks and installation of charging facilities.[12] However, barriers such as unclear and lengthy permitting processes for charging stations may stand in the way of infrastructure investments. For these reasons, there are opportunities for local jurisdictions in the states under consideration to adopt ordinances that provide greater clarity, efficiency, and improved practices for public and private-sector entities working to install charging infrastructure.

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[11] International Council on Clean Transportation, Near-Term Infrastructure Deployment to Support Zero-Emission Medium- and Heavy-Duty Vehicles in the United States (2023), https://theicct.org/publication/infrastructure-deployment-mhdv-may23/.

[12] For example, each of the four states is a signatory of the Multi-state Medium- and Heavy- duty Zero Emission Vehicle Memorandum of Understanding, which sets a target of 30 percent of new medium- and heavy-duty vehicle sales being zero emission vehicles by 2030. Multi-state Medium- and Heavy- duty Zero Emission Vehicle Memorandum of Understanding (2020), https://www.nescaum.org/documents/mhdv-zev-mou-20220329.pdf

Proposed ordinance

Localities can adopt an ordinance that updates the jurisdiction's zoning code to clearly define medium- and heavy-duty zero emission vehicles and related charging station facilities, and to create an administrative process for the permitting and development of these facilities.

Where has this been tried?

Comprehensive ordinances for permitting electric truck charging stations remain in early stages of development. However, best practices for a local ordinance can be informed by successful permit streamlining practices for light-duty ZEV charging infrastructure, lessons learned from early deployment of truck charging stations, and through stakeholder input processes and outreach to NGO and industry practitioners.

Status of current permitting practices in jurisdictions with ZEV freight truck charging stations already deployed

Although many local jurisdictions have taken on permitting reform and zoning revision for EV charging facilities, they are generally not inclusive of the infrastructure and considerations necessary for ZEV freight trucks. For example, several local jurisdictions in Maryland, Connecticut, New York, and Maine have taken actions to streamline the zoning and permitting processes for light duty electric vehicles, including publishing permitting guidelines and updating zoning regulations to include definitions of EV charging stations.[13] However, these actions are focused on considerations for charging stations serving passenger cars and trucks, and do not address ZEV freight truck charging. For example, many of the ordinances reference equipment specifications which are incompatible with MHD ZEVs, or do not address the additional considerations and community concerns freight truck charging stations may present.[14] Even in California, where each local jurisdiction is required to adopt standardized definitions for EV charging stations and to provide permitting checklists, local jurisdictions have seen the value in

[13] See, for example, Prince George's County Department of Permitting, Inspections and Enforcement, Revised Guidelines for Permitting Electric Vehicle Charging Stations, Nov. 25, 2024, https://www.princegeorgescountymd.gov/sites/default/files/media-document/DPIE%20Guidelines%20for%20Permitting%20Electric%20Vehicle%20Charging%20Stations_10.18.23%20F.pdf.

[14] For example, in the Prince George's County permitting guidance, the maximum power supply included is 240 KW. Fast charging stations for zero-emission freight trucks may reach 1,000 KW. *See Charin, Megawatt Charging System (MCS)*, https://www.charin.global/technology/mcs/.

providing additional guidance for MHD ZEV infrastructure development.[15] Kern County, for example, has released an MHDEV Infrastructure Blueprint, which analyses specific community need, potential future sites, and plans for implementation.[16]

In jurisdictions like the City of Los Angeles that are actively prioritizing MHD ZEV deployment, the permits that have been issued to date for ZEV freight truck charging facilities have generally been issued through one-off, individual processes.[17] However, this practice of individual treatment of each permit application is resource-intensive and not feasible for many local governments. It is also very difficult to scale to the level needed to meet climate and transportation electrification targets.

Because the deployment of ZEV freight truck charging facilities is in early stages, there is currently a lack of published work or resources related to zoning and permitting best practices for local governments. In discussions with state agency officials and industry stakeholders, we received strong indications that this was a policy topic in need of new analysis, and one where recommendations for local governments could be particularly impactful and complementary to other state and local policies such as grant funding programs for charging infrastructure.

Jurisdictions are soliciting input from stakeholders on best practices and needed reforms

Several jurisdictions are taking initial steps toward permitting reform and zoning revision to support ZEV MHD charging infrastructure. These efforts often include soliciting input from stakeholders, such as industry developers and utilities, to identify best practices and inform needed policy updates. For example, the City of Los Angeles has begun the process of integrating MHDZEV infrastructure into its land use planning, and has gathered input from the EV charging industry and other stakeholders.[18] Other jurisdictions have implemented pilot

[15] See Kern Council of Governments, Kern County Blueprint for MD/HD ZEV Infrastructure (2023), https://www.kerncog.org/wp-content/uploads/2023/04/2023__MD-HD_ZEV_Infrastructure_Blueprint.pdf.

[16] See *Kern County Blueprint for MD/HD ZEV Infrastructure.*

[17] This assessment of current permitting practices is based on discussions with several charging infrastructure developers who have navigated local government permitting processes.

[18] See, for example, the public stakeholder input process as part of a City of Los Angeles City Council proceeding, City of Los Angeles, Planning and Land Use Management Committee Report, Recommendations for Council action (amended for adoption) at 1(a), File No. 22-0120-S1 (Feb. 2, 2025), https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_caf_02-26-25.pdf; City of Los Angeles, Official

programs to install ZEV freight truck charging facilities with the intention of identifying best practices.[19] The San Diego Unified Port District (SDUPD) developed a Maritime Clean Air Strategy Plan, which identified several objectives related to accelerating the transition to zero emission trucks.[20] SDUPD also released a Request for Information solicitation for ZEV freight truck charging infrastructure to collect stakeholder input, followed by funding a charging station deployment.[21] The district will use this pilot program to help address potential roadblocks in future deployments, such as regulatory and permitting concerns.[22]

Proposed ordinance

To enable the deployment of ZEV freight trucks, a local jurisdiction can adopt an ordinance that updates the jurisdiction's zoning code to clearly define medium- and heavy-duty zero emission vehicles and related charging station facilities, and creates an administrative process for the permitting and development process. Local governments can consider incorporating several elements in the ordinance to streamline the development process and ensure the needs of the community are met. These ordinance elements include: (1) listing ZEV truck charging stations as a defined use in zoning regulations, (2) providing specific information regarding permitted zones and conditions for development, and (3) creating a clear administrative process for the development of these projects.

Best practices for local government ordinances may need to distinguish between two common models of ZEV freight truck charging stations, each with different permitting and zoning implications. The first model involves retrofitting or adding electric truck charging equipment to

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[19] For example, the San Diego County Air Pollution Control District funded a pilot zero-emission truck hub in March 2024, with a goal of assessing truck charging needs and strategy to support expansion beyond the pilot program. San Diego County Air Pollution Control District, 2024 Portside Community Emissions Reduction Plan Annual Report, https://www.sdapcd.org/content/dam/sdapcd/documents/capp/meetings/portside-csc/111924/2024%20Portside%20CERP%20Annual%20Report.pdf.

[20] Port of San Diego, Marine Clean Air Strategy (2021), https://pantheonstorage.blob.core.windows.net/environment/20211214-Final-MCAS.pdf.

[21] Maggie Webber, Presentation and Direction to Staff on ZE Truck Stop Proposals, Nov. 14, 2023, https://portofsandiego.legistar.com/LegislationDetail.aspx?ID=6413513&GUID=0392E8BC-81A9-4FC0-959C-3A7AE4EE1E67&FullText=1.

[22] Port of San Diego, Request for Information: Zero Emission Infrastructure for Heavy-Duty Trucks, 5, May 23, 2022, https://portofsandiego.legistar.com/View.ashx?M=F&ID=12447894&GUID=D2DD014C-6D69-4D83-8B77-56B9A9E44102.

existing truck fueling facilities, such as diesel truck stops along major highway exits. These projects typically do not require changes to existing zoning designations, but do necessitate additional electrical permits, making them strong candidates for streamlined permitting processes. A local government could pass an ordinance to update existing permitting processes and requirements to facilitate the development of this type of project.

The second model involves the development of new, dedicated zero-emission truck charging depots, often sited near ports or major freight logistics hubs. These facilities can present significant challenges for local permitting and zoning processes, as they may not align with existing land use categories. In the absence of a clear definition, ZEV truck charging facilities are typically treated as either a truck parking facility or a conventional diesel truck fueling station for siting approval purposes.[23] Without a defined use that incorporates the specific qualities of a MHD ZEV charging station, such projects may face delays or denials, underscoring the need for local ordinances that explicitly recognize and accommodate this emerging use.

In many jurisdictions, the approval process for a project that is not clearly defined in the local zoning code can be a difficult, resource intensive process. In some jurisdictions, zoning authorities are permitted to make variances or approve unlisted uses, but often must rely on the definitions and restrictions of similar uses.[24] In the context of ZEV freight truck charging stations, this may mean attempting to approve a project under the definition of “truck stop,” “fueling station,” “service station,” and so on. These definitions rarely capture the unique qualities of a ZEV freight truck charging station, and the additional review and approvals required to account for those differences can be extensive. By plainly defining a ZEV freight truck stop charging station in local zoning regulations, jurisdictions can avoid these extensive review processes. Broad definitions for truck charging facilities,which include accessory buildings, structures, and renewable energy sources, can provide added benefit and further streamline this process. As one example, allowing for the installation of solar canopies can generate zero-carbon electricity and reduce the costs and electric grid impacts of a charging facility.

After creating a permitted use definition, it is important to assess and plainly state where these projects may or may not be sited. In zones with established truck corridors, it may be appropriate to grant permitted use without caveats. In other zones that are still a potential site

[23] This assessment of challenges related to the definition of a ZEV freight truck charging facility is based on interviews conducted by GCC with multiple charging infrastructure developers.

[24] See e.g. “Unlisted Use” sections of Hartford, CT, and Syracuse, NY zoning regulations.

for ZEV freight truck charging stations, but have additional safety or nuisance concerns, a jurisdiction may wish to place additional precautions or conditions on site selection. These specifications should be made explicit in the zoning code. For example, if a ZEV truck charging station is conditionally permitted use in a commercial zone because it requires a traffic study and must adhere to certain aesthetic considerations, those requirements can be plainly stated in the zone-specific regulations.

The ordinance may also identify an administrative process for the approval of ZEV freight truck charging stations. Identifying which departments would be involved at various stages of the development process, outlining timelines for different phases, and selecting a point person with whom developers can communicate can all contribute to a more streamlined process. Furthermore, publishing resources like permitting and site development guidelines on a website that is easily accessible to developers can help to streamline the administrative approval process.

One example of the process to develop such an ordinance comes from the City of Los Angeles. On February 26, 2025, the City Council adopted recommendations from the Planning and Land Use Management Committee, including directing the Department of City Planning to draft an ordinance which would define electric vehicle charging "as a primary use citywide for light, medium, and heavy duty vehicles (including private fleet charging)."[25] During the City of Los Angeles public engagement process, industry commenters supported the inclusion of site requirements, and submitted suggestions for best practices to be considered by the Department of City Planning.[26] Commenters expressed that regulatory clarity regarding prohibitions or special requirements on siting facilities within certain zones would be beneficial.[27] Examples

[25] City of Los Angeles, Planning and Land Use Management Committee Report, Recommendations for Council action (amended for adoption) at 1(a), File No. 22-0120-S1 (Feb. 2, 2025), https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_caf_02-26-25.pdf; City of Los Angeles, Official Action of the Los Angeles City Council Adopting Report, File No. 22-0120-S1 (Feb. 26, 2025), https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_caf_02-26-25.pdf.

[26] Amira Streeter, letter from Voltera Power regarding the June 18, 2024 Planning and Land Use Management Committee Meeting (Council File 22-0120-S1), June 17, 2024, https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_PC_PM_06-17-2024.pdf; Amira Streeter, letter from Voltera Power regarding Agenda Item No. 5 on the June 4, 2024 Planning and Land Use Management Committee Meeting (Council File 22-0120-S1), 1-3, June 03, 2024, https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_PC_PM_06-03-2024.pdf; Romic Aevas & Noelani Derrickson, letter from EVgo and Tesla regarding Agenda Item No. 5 on the June 4, 2024 Planning and Land Use Management Committee Meeting (Council File 22-0120-S1), 4-7, June 03, 2024, https://clkrep.lacity.org/onlinedocs/2022/22-0120-S1_PC_PM_06-03-2024.pdf.

[27] *Id.*

might include the prohibition of siting a project within a certain distance from sensitive use areas, required site improvements like landscaped setbacks, or other affirmative actions to protect the neighboring properties and the community to moderate the potential traffic, safety, noise, and other impacts associated with these facilities.[28]

These elements, taken together, could create an ordinance which streamlines the project development of these essential projects, while also protecting the interests of the local community.

Identifying potentially promising local jurisdictions

In identifying local jurisdictions that are promising candidates for this ordinance, we suggest two primary criteria:

1. Local jurisdictions that are likely sites for early deployment of ZEV freight trucks, and
2. Jurisdictions that are authorized to implement zoning and permitting ordinances without additional state action.

In evaluating the likelihood of a jurisdiction being an early deployment site for ZEV freight trucks, we consider whether the jurisdiction has major freight facilities (including ports, logistics hubs, and interstate highways), whether any state or federal grant funding programs are targeting the jurisdiction for investment in ZEV freight trucks or charging infrastructure, and any announced deployment targets or commitments. One of the primary considerations is whether a jurisdiction has facilities or roadways included in the National Zero-Emission Freight Corridor Strategy, a 2024 publication by the federal Joint Office of Energy and Transportation, in collaboration with the U.S. Department of Energy, U.S. Department of Transportation, and the U.S. Environmental Protection Agency.[29] This strategy document evaluated transportation facilities across the United States and identified priority locations for early deployment of ZEV freight truck charging infrastructure, divided into four phases, with Phase 1 being highest priority for early deployment.

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[28] *Id.*

[29] Joint Office of Energy and Transportation, National Zero-Emission Freight Corridor Strategy (2024), https://driveelectric.gov/files/zef-corridor-strategy.pdf.

About this Research

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Cover image: Heavy-duty zero-emissions trucks lined up with a charger in the foreground. Shutterstock.