

DEUSA Fleet Success Stories: City of Portland



Location: Portland, Maine

Fleet type: Heavy-duty electric vehicles (municipal)



Narrative: The City of Portland has established ambitious sustainability goals focused on improving the environment and local citizens' health and addressing climate concerns for its population of 68,854 residents. Portland is working towards its goals with a diverse set of strategies, including by transitioning to clean, renewable energy; strengthening community resilience and collaborative capacity; and promoting safe, sustainable transportation options.

Through *One Climate Future*, a joint climate action plan developed by the Cities of Portland and South Portland, both municipalities have committed to transitioning municipal operations to 100% clean energy by 2040. The plan also outlines strategies to expand electric vehicle (EV) charging infrastructure, explore EV pilot programs, collaborate with partners statewide to encourage EV adoption, and support workforce training for EV maintenance and operations. In support of these objectives, the City of Portland owns and operates several EV charging stations, which can be found on the [City's website](#). To ensure charging access expands alongside new developments, the City has implemented EV-ready development requirements, such as a mandate that EV charging infrastructure be available in parking lots containing five or more spaces.



In 2024, Portland received Maine's first electric refuse truck, a Mack LR Electric model. This vehicle represents both the City's first Class 8 vehicle (33,000 lbs. or more) and its first heavy-duty electric vehicle. Equipped with a 376-kWh battery pack, the truck combines fast-charging capability with a two-stage regenerative braking system that recaptures kinetic energy from the frequent stops typical of waste collection routes. These features enable the vehicle to complete its daily routes efficiently, even as payloads increase throughout the day.

Although the electric refuse truck carried a capital cost of approximately \$684,000, roughly double that of a comparable diesel-powered vehicle, the City anticipates lower operating and maintenance costs due to the elimination of diesel fuel expenses and reduced service requirements, such as oil changes. The vehicle, affectionately nicknamed **"Optimus Grime"** by Portland residents, was funded through a combination of grants from the U.S. Environmental



The Mack electric trash truck. (Source: Mack Trucks)

Protection Agency's Diesel Emissions Reduction Act (DERA) program and the Maine Department of Environmental Protection (MaineDEP).

Beyond the electric refuse truck, the City of Portland has begun transitioning portions of its municipal fleet to zero-emission vehicles, including at least two passenger EVs and several pickup trucks. The Mack LR Electric remains Portland's first heavy-duty EV and serves as a significant milestone in the City's broader fleet electrification efforts.

Outputs

- The refuse truck can save a reported \$400,000 in fuel costs and \$125,000 for maintenance costs over the vehicle's useful life.
- Deployed Maine's first battery-electric refuse truck, a Class 8 Mack LR Electric.
- Secured funding through the EPA's DERA and the MaineDEP to offset part of the larger capital expense of the truck.
- Retired an older, less-efficient diesel vehicle.
- Installed a new DC fast charger at the Portland Public Works facility.

Outcomes

- **Alignment with Climate Goals:** These EV and infrastructure efforts reduce carbon emissions and environmental impact in accordance with the City's climate goals, and gets the City on track for their goal of powering everything with clean, renewable energy.
- **Cost Savings:** Although the capital costs for the EV trash truck are more than internal combustion engine (ICE) vehicles, lifetime operations costs are lower thanks to no diesel costs or oil changes and fewer yearly maintenance requirements.
- **Noise Reduction:** Transitioning to a battery electric refuse truck significantly reduces noise pollution along its neighborhood routes.

EMISSIONS BY SECTOR

34% COMMERCIAL BUILDINGS

22% RESIDENTIAL BUILDINGS

0.3% WASTEWATER

3% SOLID WASTE

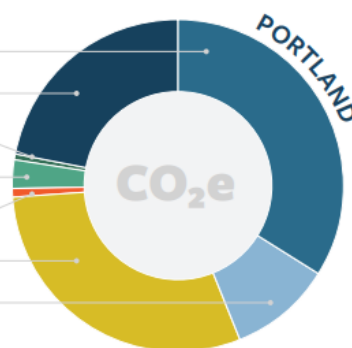
0.8% WATERBORNE TRANSPORTATION

30% ON-ROAD TRANSPORTATION

10% INDUSTRIAL BUILDINGS

840,419 MTCO₂e

OF GREENHOUSE GASES EMITTED IN 2017



2017 Greenhouse gas emissions, the baseline for One Climate Future projections. (Source: One Climate Future, p 26)

Best Practices & Lessons Learned: The City of Portland stacked multiple funding sources for the Mack LR Electric truck, combining EPA Diesel Emissions Reduction Act (DERA) grants with Maine DEP funding. This model can be replicated by other municipalities for their first heavy-duty EV purchase. They have also led

their fleet electrification strategy with high-mileage, high-stop-frequency vehicles. Refuse trucks are ideal early candidates: the truck's two-stage regenerative braking system recaptures energy from the hundreds of stops it makes each day as its load increases, which plays directly to an EV's strengths and helps justify the business case.

Portland chose the Mack LR Electric partly because of local dealer support and the Mack Ultra Service Maintenance Agreement. The truck is serviced locally at O'Connor Motor Company, meaning the City can benefit from an existing vendor relationship. The city used public engagement to build buy-in by inviting residents to submit and vote on truck names, with "Optimus Grime" winning 55% of over 940 votes cast. By highlighting visible fleet investments and sharing their benefits, municipalities can build community support for electrification while demonstrating how clean transportation technologies contribute to local climate and air quality goals.

Furthermore, Portland mandates EV-readiness in new development as any parking lot with 5+ spaces must include EV charging. This infrastructure expands the broader charging network without relying solely on municipal capital.

For lessons learned, the total cost of ownership, not sticker price, is the best comparison metric. The truck costs roughly double what a diesel unit does in up-front costs, but the City projects ~\$400K in fuel savings and ~\$125K in maintenance savings over its useful life. Additionally, non-financial benefits matter for public and political support. Noise reduction along residential collection routes was a tangible, immediately noticeable benefit for residents.



The Mack electric trash truck. (Source: Maine Public)

Portland is deliberately phasing electrification with pilots, rather than converting the whole fleet at once, which limits risk while the City and vendors learn from the first heavy-duty deployment. As fleet electrification sits inside the joint One Climate Future plan with South Portland, lessons and vendor relationships from this one truck can inform electrification decisions across two municipalities.