DEUSA Fleet Success Stories: City of Knoxville, TN

Location: Knoxville, Tennessee
Fleet type: Light-duty electric vehicles

Narrative: The East Tennessee Clean Fuels Coalition (ETCF) began working with the City of Knoxville and its Fleet Services Director Keith Shields in the 2010s to consider and evaluate multiple alternative fuels. The city developed plans around securing several different kinds of alt-fuel vehicles including heavy-duty CNG vehicles, off-road propane mowers, and hybrid vehicles early on, garnering quite a few hybrid vehicles and then growing their propane mower program to nearly 20 mowers (and thanks to the Propane Council, ending up with an excellent video about the fleet). Around 2015, they began looking more carefully at acquiring light-duty (LD) electric vehicles (EVs).

The city purchased its first LD EVs in 2018, putting them into service in early 2019. They were two Nissan Leafs (the photos below show one of those first two Leafs, and Shields with it in the top photo). Since then, they have purchased six more Leafs (three received in 2021 and three received in early 2022). Those Leafs are used in four different city service departments including Inspections, Civil Engineering, Housing & Neighborhood Development, and Fleet Services. The original two Leafs were basic Leafs, while the purchases since have been Leaf SVs and SV Plusses.

A core partner with the City of Knoxville's Fleet Services team is the city's Office of Sustainability. The Office of Sustainability installs and manages free public EV charging at city-owned parks, parking garages, and offices. Their team took over previous public-private partnership installations and began offering free charging in 2017 as a way to incentivize EV adoption to residents and visitors to Knoxville. The Office of Sustainability, formed in 2007, works with elected officials to set ambitious greenhouse gas (GHG) reduction goals and implement operational strategies with other city departments.

After exceeding its 20% by 2020 goal, the Office of Sustainability sponsored a city council resolution to set a 50% by 2030 operations target and an 80% by 2050 community-wide target. To set a path to

achieve those goals, Mayor Indya Kincannon convened the "Mayor's Climate Council," led by Sustainability Director Brian Blackmon, which held numerous meetings during 2020 and 2021. ETCF representative Jonathan Overly served on the Transportation Technical Working Group which reviewed and recommended priorities for the city to adopt. With input from the technical expertise of committee members, the city produced the "2021 Energy & Sustainability Work Plan."

Spurred by the new priorities, the city's Fleet Division, now under the leadership of Nicholas Bradshaw, began refining past fleet-procurement planning in partnership with the Office of Sustainability. The city adopted a Green Fleet Policy in 2021 that uses a Total Cost of Ownership (TCO) model to evaluate future purchases, and the policy outlines a five-tier system wherein the highest, cleanest tier should be purchased if the technology is available and fares well in the TCO modeling. Tier 1 includes only zero-emission vehicles; Tier 2 is an alternative fuel vehicle; Tier 3 is a hybrid vehicle; and Tiers 4 and 5 are gasoline and diesel vehicles, respectively. Since the development of the plan, the city has ordered 21 additional EVs (now including Hyundai Kona Electrics) as they retire gasoline vehicles in their fleet. *Mr. Bradshaw is proud to say that his Fleet Department has not purchased a non-emergency light-duty vehicle that does not utilize electricity or alternative fuels in the past three years.* (Along with their EV work, the Fleet Division has also implemented a renewable propane program and is growing vehicle use of that fuel in LD vehicles.)

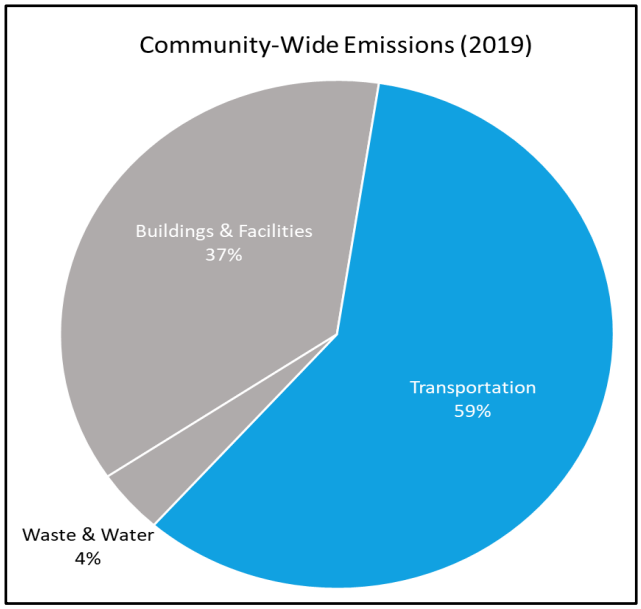
The city's Office of Sustainability has also increased available EV charging throughout the city. In 2022, the city developed a GIS-based site analysis tool that considers the potential viability of new city-owned EV installations. It considers nearby housing density, traffic volumes, and proximity to commercial properties, but also includes equity factors such as car ownership, income, and localized air quality. They've also created an interactive map that allows residents to drop pins on a map, along with some context about why they may need charging in that area, to request new installs that are considered when evaluating potential new replacements. The city has used this information to place four new sites in the last year, and through a partnership with the local electric utility (Knoxville Utilities Board) will place a new public fast-charging location soon.

Outputs & Outcomes: The *outputs* from the city's efforts are numerous but clearly include a ramping up of EV purchases, as well as the creation of the Green Fleet Policy and Energy & Sustainability Work Plan. However, the City has produced numerous informational pages and links for citizens to learn about EVs on their website which gives community citizens easy access to know what is going on in their city with cleaner-vehicle planning. Another outcome from their work was the continued expansion of free charging around the city in parking garages and at city parks, which has grown to 31 Level 2 charging ports at 12 sites in 2023.

The *outcomes* from this work span several layers:

1. The GHG emission reductions from each LD vehicle replaced with an EV in the city are on the order of 70%, which is huge (and depends on the fuel economy of the vehicle that it replaced).
2. It helps the city and community make inroads toward the developed climate impact reduction goals. (See the graph below from 2019 that shows the magnitude of the community wide transportation-based GHG problem; see the discussion and graph here on the city's website.)
3. More community citizens and visitors to the area see EVs at work around the city.

4. The city and the local EV chapter (KEVA, the Knoxville EV Association) work together more on publicizing information about EVs, which in turn educates more citizens about the benefits of EVs while breaking through perceived barriers in the minds of potential EV owners.



Best Practices & Lessons Learned: Having been a part of some of this work and witnessing first-hand the city's efforts, it boils down to a) having a good team to work collectively on the mission, b) setting clear goals, and c) selecting your working partners carefully. It is not uncommon for cities and their sustainability offices to have limited experience with EVs and EVSE (EV chargers), so learning along the way is part of the process. One lesson learned is to select your EVSE partners carefully, and do your homework on their service after the sale.