



# ELECTRIC VEHICLE & CHARGING STATION PLANS

for Local Governments

From the mountains to the sea, cities, towns and counties across North Carolina are installing electric vehicle charging stations and purchasing plug-in electric vehicles (PEVs). Some of these entities have carried out the installations and purchases as part of their standard public works or fleet operations, while many were carried out as a special project or a pilot project by the appropriate department or the entity's office of sustainability. Other projects were carried out as part of a formal plan, designed with the input of multiple departments, and perhaps with the input of regional partners and Councils of Government.

The Durham City-County Electric Vehicle and Charging Station Plan<sup>1</sup>, which is formally approved by city and county elected officials is the first known example, of such a plan in North Carolina, and it appears to be one of only a handful in the United States. The goal of this document is to discuss key points related to the development and content of Durham's plan, in order to share concepts and information that can help other local governments create or modify their plans.

## Plan Content

Local governments have many options with regard to the extent of their planning for PEVs. At a minimum, their permitting staff must be prepared to evaluate applications from local citizens and businesses that desire to install vehicle charging equipment, and the electrical inspections department must be prepared to enforce the appropriate construction codes to approve the installations. First responders should be informed on the unique aspects of emergency response to incidents involving PEVs and hybrid vehicles<sup>6</sup>. The National Highway Transportation Safety Administration (NHTSA) does not believe PEVs present a greater risk of post-crash fire than gasoline-powered vehicles<sup>2</sup>; however, NHTSA acknowledges PEVs have specific features that may warrant new approaches to emergency response.



Public charging station at the Durham County South Regional Library, Durham, N.C.

Beyond those minimum requirements, local governments may optionally choose to install charging stations for the use of their citizens, purchase PEVs for use in their fleets or establish ordinances governing the use of public charging stations, associated signage and site design elements. Durham's plan takes a comprehensive approach, which has a single over-arching goal:

*"To encourage the use of plug-in electric vehicles in Durham as a substitute for petroleum powered vehicles to help achieve community-wide air quality and greenhouse gas emissions reduction goals."*

A background section along with an overview of charging technology and cost precede the detailed description of the plan. These sections are used to provide a basic level of knowledge about the governing context, relevant technologies and rationale for the plan elements to policy makers and citizens who will likely be considering the plan elements for the first time.



<sup>1</sup> NC Department of Insurance Access Update Newsletter, Vol. 3 Issue 2, August 2012

<sup>2</sup> Note that enforcement of the ADA Standards will be by the US DOJ

## Plan Details

Several fundamental questions may be raised repeatedly during the planning and approval process, so it is helpful to have the answers provided with the plan. Durham created a frequently asked questions list<sup>3</sup> to help address this need. The plan details are comprised of four main objectives that address:

- City and County Operations
- Standards and Barriers
- Infrastructure
- Public Information

The plan details are followed by several policy recommendations, including performance evaluation measures for:

- City and County Operations
- Standards and Barriers
- Infrastructure
- Incentives

The plan concludes with lists of current public charging station locations and high-priority future locations, both on public and private properties.

### City and County Operations:

Highlights of the plan include describing foreseeable roles for the multiple departments in both the city and county governmental structures that will be impacted by the adoption of PEVs, describing fleet management personnel's role in procuring PEVs and related charging stations, and the need to adopt appropriate employee policies for their use.

### Standards:

Provides guidelines and criteria for the appropriate design, placement, and installation of charging stations, from safety to availability of power to visibility. Accessibility of charging stations to disabled PEV drivers is a key issue, and the requirements of existing accessibility codes are incomplete.

### Infrastructure:

Establishes guidelines for the selection of charging station locations. While the immediate goal is to provide stations for city and county residents, it is recognized that a valuable focus is to serve visitors driving into Durham from longer distances, enabling their use of a PEV by boosting confidence in their driving range. Another key initiative is to pre-install power and data conduits for future charging stations during construction or regular maintenance at sites that meet the selection criteria. Pre-installing conduit can significantly reduce the installation cost for a future charging station.

## PLAN EXAMPLE:

### Durham City-County Electric Vehicle and Charging Station Plan

Durham's Office of Sustainability was already gathering information and framing a plan in 2011 when a City Council member officially requested a report on the City's plan for PEVs. Work continued with this official mandate, and the resulting document was approved by both the Durham County Commissioners and the Durham City Council in January 2012.

### Unique Aspects

Durham's plan is a joint city and county plan. Several departments in Durham's operational structure are merged across city and county jurisdictions, such as the Planning and Inspections departments. This served to facilitate the development of the plan, led by the Office of Sustainability, which is also a joint city-county function. The sustainability staff conducted a series of meetings to engage all the required governmental stakeholders in the plan development process, as well as representatives from local universities, electric utilities and technical advisors.

### Supporting Factors for Development

In 2007, Durham's city and county governments jointly adopted a local action plan for the reduction of greenhouse gas and criteria air pollutant emissions<sup>4</sup>. Durham's local action plan for air pollutants sets targets for emissions reductions from the entire community, both government and citizens. Because PEVs can reduce or eliminate point-source vehicle emissions, the creation of the Electric Vehicle and Charging Station Plan directly supports the goal of the local action plan to reduce air pollution by supporting both government and community use of electric vehicles. The staff of the Durham Inspections Department has been invaluable in the development of draft accessibility guidelines for North Carolina.

**Public Information:**

Defines requirements for City and County staff to share charging station locations with citizens<sup>5</sup>, local PEV dealers and national databases. It also describes options for marketing and educational signage that may be installed on charging stations and vehicles to increase public awareness.

**Policy Recommendations**

Highlights of the Policy Recommendations include conducting an annual cost/benefit analysis of fleet PEVs in order to establish broader goals for fleet conversion to PEVs and installation of the appropriate amount of charging infrastructure to support those vehicles. Fleet policies will be changed as appropriate if PEVs are assessed to be cost effective (including potential outsourcing of maintenance), and feasibility studies will be required before switching from conventional vehicles.

With regard to public charging stations, a plan for annual evaluation of usage is prescribed, along with an evaluation of whether it is feasible to assess fees for the use of public charging stations, consideration of appropriate incentives for public charging stations on commercial property and development of a long-range (five year) infrastructure plan.

As seen in the plan details, many municipal departments can be affected by the adoption of PEVs and it follows that changes to departmental policies may be required.



*City-owned PEVs and charging stations at the Golden Belt campus Durham, N.C.*

**A model for other Plants**

The Durham Electric Vehicle and Charging Station Plan is a versatile model for local governments that desire to create an implementation plan for PEVs and charging stations, regardless of whether it is desired (or required) for the plan to be politically approved.

The plan addresses a broad, inclusive range of operational and policy issues, and establishes a flexible and data-driven approach to evaluating performance and making subsequent adjustments to operations and policies. Overall it demonstrates a practical balance between progressive implementation of an emerging technology and conservative assessment to ensure performance and cost-effectiveness.

For more information about Durham County’s electric vehicles, contact the Durham City-County Sustainability Office at 919-560-7999 or visit [www.GreenerDurham.net](http://www.GreenerDurham.net).



## References

### <sup>1</sup>Durham Electric Vehicle and Charging Station Plan

[http://durhamnc.gov/ich/cmo/sustainability/Documents/Durham EV and EVCS Plan.pdf](http://durhamnc.gov/ich/cmo/sustainability/Documents/Durham%20EV%20and%20EVCS%20Plan.pdf)

### <sup>2</sup>NHTSA Interim Guidelines

[http://www.evsaftytraining.org/resources/~/\\_media/files/pdfs/nhtsa\\_interim\\_guidance\\_electric and hybrid vehicles.pdf](http://www.evsaftytraining.org/resources/~/_media/files/pdfs/nhtsa_interim_guidance_electric_and_hybrid_vehicles.pdf)

### <sup>3</sup>Durham EV and Charging Station FAQs

[http://durhamnc.gov/ich/cmo/sustainability/Documents/EV and Charging Station FAQs county.pdf](http://durhamnc.gov/ich/cmo/sustainability/Documents/EV%20and%20Charging%20Station%20FAQs%20county.pdf)

### <sup>4</sup>Durham Greenhouse Gas and Criteria Air Pollutant Emissions Inventory and Local Action Plan for Emissions Readiness

<http://dconc.gov/modules/showdocument.aspx?documentid=1211>

### <sup>5</sup>Durham Charging Station Information and Map

<http://durhamnc.gov/ich/cmo/sustainability/Pages/EVCS.aspx>

### <sup>6</sup>Simple Guide for First Responders

<http://www.advancedenergy.org/portal/ncpev/resources.php>

### <sup>7</sup>Accessibility for Public Charging Stations

<http://www.advancedenergy.org/portal/ncpev/resources.php>



## Disclaimer

Advanced Energy makes information available to enhance public knowledge. The information in this guide is provided “as is” and at your own risk. Advanced Energy does not make any representation or warranties of any kind, express or implied, about the accuracy, suitability for any purpose, merchantability of, title to or usefulness of the information in this guide.

By using this guide, you agree that you are solely responsible for all damages or injury that may result from or be caused by such use. Advanced Energy, its agents and employees shall not be liable to you or other third parties for any damages (including special, indirect, consequential, or incidental damages or damages for loss of profits, revenue, or loss of use) arising out of or relating to the information contained herein whether such damages arise from mistakes, errors, omissions or interruptions.

