Electric Vehicle Deployment

*Municipal Best Practices Study*

Atlanta Division of Sustainability Research Report

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**Summary:** This paper consolidates the best practices in overcoming the lack of municipal systems and physical infrastructure for electric vehicles entering the market around the United States and Canada. It is intended to provide keys to success for municipalities that seek to be electric vehicle ready.
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Acknowledgment & Disclaimer

Acknowledgment

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Special thanks are extended to the following individuals who responded and supported this project:

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Background

Current State of Atlanta EV Readiness

In March 2010, under the leadership of Clean Cities Atlanta, the Metro Atlanta Plug-in Electric Vehicle Readiness Task Force (MAPEVRTF) was created in response to solicitations by leading automotive manufacturers seeking markets for the new generation of electric passenger vehicles set to be launched to the commercial fleet and retail consumer markets in 2011. The Task Force consists of local and state government entities, commercial EV interests, local utility companies, and the Clean Cities Atlanta coalition, representing local fleet interests. The group executed an MOU with Nissan Motor Corp. through Clean Cities Atlanta that committed the City of Atlanta to preparing for the arrival of electric vehicles. In coordination with Clean Cities Atlanta, the City then began to identify and remove barriers to adoption that potential electric vehicle owners would face. The areas of concern were consolidated into a survey, which was distributed to glean lessons learned from leading cities with experience in deploying electric vehicles. Atlanta’s Division of Sustainability appointed an EV deployment specialist to administer the survey and consolidate the best practices.

The intent of this document is to address common questions and concerns and to serve as a starting point for further investigation. In addition to this document, The Rocky Mountain Institute “Project Get Ready” Online offers a comprehensive source of information on preparing municipalities for electric vehicles at http://projectgetready.com/category/menu

Sources of Information

This white paper is not intended to be an exhaustive source of information on fully resourcing a municipality to be 100% electric vehicle ready. Rather a compilation of data from best practices surveys from 13 municipal entities with experience in meeting the needs of their residents who are choosing to become electric vehicle owners. The Atlanta Division of Sustainability surveyed a total of 29 municipal departments from 13 States, 2 Canadian cities & Washington DC.

For more detailed information on this topic contact Jules Toraya at jtoraya@atlantaga.gov.
Best Practices

Permitting Practices

The most successful permitting processes methodically outline the steps that electric vehicle owners must complete for the installation of the necessary EV charging infrastructure. The permitting entity, in collaboration with utilities, car dealers and electrical contractors must be able to outline the required steps to their consumer.

In response to this need for information, cities are taking action. San Francisco, California is preparing Electric Vehicle (EV)-ready checklists for the City's and permit office’s websites to help residents move through the process easily. Raleigh, North Carolina developed a clear process¹ and even posted a YouTube video² for its residents to follow and learn about the requirements for installing an electric vehicle (EV) charging station.

Consumers aren’t the only ones that have to orient themselves to a new way of thinking.

Ensuring that electric vehicle charging stations are safe takes deliberate effort from a municipal government electric/building permitting department to understand electric vehicle charging station standards, as outlined in National Electrical Code (Section 625 Electrical Vehicle Charging System)³, and to implement new standards into existing permitting processes. This process can be more challenging when states impose differing standards to their cities.

Cities in Tennessee are being managed by the State to ensure they are in compliance with the most current National Electric Code, 2008 NEC. State standardization may initially add complexity, but this can be an advantage. For example, the Oregon Electrical Specialty Code⁴ is more prescriptive than NEC 2008. This code establishes a permitting and inspection protocol for electric vehicle charging stations. As part of the Oregon Governor’s sustainability agenda, the division is working to accommodate new sustainable technology advances.

Oregon has a minor label program⁵ that allows certified contractors participating in the program to install eligible equipment without going through the traditional permitting and inspection process. Minor labels are inexpensive permits for minor electrical and plumbing, residential and commercial installations. Contractors may buy these labels online, make the installations and document how the labels were used on their online account. The Oregon Building Codes Division selects one installation from every ten labels a contractor uses for

¹ [http://raleighnc.gov/search/content/CityMgrDevServices/Articles/StandAlonesResidential.html](http://raleighnc.gov/search/content/CityMgrDevServices/Articles/StandAlonesResidential.html)
² [http://www.youtube.com/cityofraleigh#p/c/AF17C78F3A3075BD/6/_x4YezUX8lo](http://www.youtube.com/cityofraleigh#p/c/AF17C78F3A3075BD/6/_x4YezUX8lo)
³ [http://books.google.com/books?id=im1rgZnFmMC&pg=PT196&lpg=PT196&dq=2008+national+electric+code+section+625](http://books.google.com/books?id=im1rgZnFmMC&pg=PT196&lpg=PT196&dq=2008+national+electric+code+section+625)
⁴ [http://arcweb.sos.state.or.us/rules/OARS_900/OAR_918/918_305.html](http://arcweb.sos.state.or.us/rules/OARS_900/OAR_918/918_305.html)
⁵ [http://www.bcd.oregon.gov/programs/minorlabel/minor_label_programs.html#2](http://www.bcd.oregon.gov/programs/minorlabel/minor_label_programs.html#2)
inspection. This does more than speed up the turn-around time it takes for the consumer to get a permit for their electric vehicle charging station, it saves money.

As a result of this policy, the corresponding increase in workload for city permitting agencies will be more manageable even with a surge in permit requests. This technique assumes some risk because not every piece of electric vehicle charging equipment is inspected; however it empowers licensed electrical contractors. The State holds the electrical contractor’s license as an additional incentive for quality control and quality assurance. Failed inspections\(^6\) result in either: making the correction and paying the jurisdiction’s hourly re-inspection fee or contesting the inspection results.

Raleigh, North Carolina is further mitigating the risk of electrical hazards by developing educational programs with a local stakeholder. Training programs are being developed at Wake Technical Community College to address various installation scenarios for electric vehicle charging stations. These training programs are being designed for regional electrical contractors as well as electrical inspectors. Raleigh’s Office of Sustainability plans on outlining the personnel who complete these training programs to local car dealers who will sell electric vehicles.

**Local Government Actions**

Cities that are serious about paving the way for electric vehicles should follow the lists of actions outlined in the Rocky Mountain Institutes “Project Get Ready”\(^7\) (PGR). PGR has a prioritized list of the most important actions cities must take to be ready for electric vehicle deployment, as well as financial analysis where possible.

The most common thread shared between PGR and cities surveyed is city leadership. A local government leader (Mayor, Deputy Mayor, etc) needs to form a stakeholder group that helps regulatory, commercial and community interests align. Once this group is formed this government leader must function as a champion to ensure the group moves forward.

Securing funding to maximize incentives is an essential action that cities must take in order to make electric vehicles more attractive to consumers. Austin, Texas is scheduled to offer home charging station incentives to residents who buy or lease Plug-in Electric Vehicles (PEVs). This Energy Plug-In Partners Pilot Program is still pending approval from Austin’s City Council.

San Francisco regional air quality agency, the Bay Area Air Quality Management District\(^8\), has also established a new $5 million EV infrastructure grant program\(^9\). This program provides


\(^{9}\) [http://www.baaqmd.gov/~jmedia/Files/Communications%20and%20Outreach/Publications/News%20Releases/2010/charge_100804.ashx](http://www.baaqmd.gov/~jmedia/Files/Communications%20and%20Outreach/Publications/News%20Releases/2010/charge_100804.ashx)
grants for EV charger installations at commercial locations as well as residences. The $5 million is scheduled to purchase: 3,000 home chargers at single family and multi-family dwellings, 2,000 public chargers at employer and high-density parking areas and 50 fast chargers within close proximity to highways.

The Cities of Houston, Texas and Seattle, Washington created consumer demand overlays to outline where electric vehicle charging stations will be needed in the future. These maps highlight where potential EV owners likely live and work. These cities’ ability to project where infrastructure will be needed in the future helps to persuade local businesses to share the costs associated with the installation of electric vehicle charging stations.

Raleigh, North Carolina plans to advocate on behalf of electric vehicle owners to encourage major employers to provide charging stations for these employees. Having EV charging stations at home and work will further mitigate the range anxiety for potential EV owners.

Vancouver, Canada installed charging stations on city owned parking lots to entice residents to become EV owners. This strategy has only cost the city the charging stations and signage. Since there are no EVs on the road, using these charging spaces the city can market free charging with no additional cost.

State Government Actions

State leadership can communicate the future needs of their cities to the federal government and supply additional funding to support their cities. The best examples are Arizona, California, Florida, Tennessee, Texas, Maryland, Michigan, New York, Oregon, and Washington. Reference the EV Project\(^\text{10}\) and Charge Point America\(^\text{11}\) for additional information.

Much of the progress that is being made in the United States for building electric vehicle infrastructure has been made possible by the American Recovery and Reinvestment Act, through the Transportation Electrification Initiative administered by the Department of Energy. Therefore, the states that are the most organized in outlining their electric vehicle infrastructure requirements will be much better positioned to secure resources to help accelerate infrastructure deployment.

Oregon Governor Ted Kulongoski announced the creation of the Oregon Transportation Electrification Executive Council through Executive Order 10-09 to create a central point of coordination of electric vehicle (EV) strategy, development and deployment for the state of Oregon\(^\text{12}\). During the 2009 session, the Washington Legislature passed House Bill 1481 outlining a variety of provisions to support electric vehicles and electric vehicle infrastructure in the state. It required the Puget Sound Regional Council to put together an EV model ordinance and regulations to assist local governments in facilitating EV adoption.

\(^\text{10}\) [http://www.theevproject.com/](http://www.theevproject.com/)
\(^\text{11}\) [http://chargepointamerica.com/](http://chargepointamerica.com/)
The State of California has defined a plan for a sustainable transportation model in which the State and local governments are work in partnership with the private sector to move toward clean, electric cars fueled by renewable energy, supported by an open network infrastructure.

The State of California Clean Vehicle Rebate Project (CVRP) will provide purchasers of qualifying plug-in vehicles with rebates of up to $5,000. CVRP is funded by the California Environmental Protection Agency's Air Resources Board and administered statewide by the California Center for Sustainable Energy. Securing funds to minimize costs for consumers that want to become EV owners will push more Americans to become electric vehicle owners.

Local Business Engagement

Be creative in seeking partnerships with local companies. San Francisco capitalized on an opportunity, with Cisco, to marry the environmental benefits of public transit with technology. This project resulted in improved service reliability and made alternative transportation more attractive to consumers; reference “The Connected Bus Project”.

Show the community what businesses are doing to advance the alternatively fueled vehicle choice for consumers. General Electric has reached an agreement with Purdue University to place up to 10 of its new electric vehicle (EV) charging stations on local campuses, with construction to begin by the end of year. Funded by a $6.1 million American Recovery and Reinvestment Act grant, the consortium includes Purdue, Notre Dame University, Indiana University-Purdue University Indianapolis, Ivy Tech Community College, Purdue University Calumet and Indiana University Northwest.

Identify technical skills that will be needed in the future to sustain an electric vehicle-centric society and work with educational institutions to create appropriate curriculums. General Electric EV charging stations will be used by various classes and researchers to work on electric-powered technology and to recharge university-operated electric vehicles.

General Electric and Better Place, a leading electric vehicle (EV) services provider announced a technology and financing partnership to accelerate the global deployment of electric vehicle infrastructure. The Better Place approach to EV infrastructure provides access to a network

14 http://energycenter.org/index.php/incentive-programs/clean-vehicle-rebate-project
15 http://www.arb.ca.gov/homepage.htm
16 http://energycenter.org/
17 http://www.youtube.com/watch?v=erlWqNnbRY
of charge spots\textsuperscript{21}, battery switch stations\textsuperscript{22} and systems that optimize the driving experience while minimizing costs to consumers. This partnership will allow consumers that manage charging costs under Better Place's network to easily charge their vehicles using GE's WattStation\textsuperscript{23}.

General Motors has built multiple strategic business partnerships with utility companies to promote electric vehicle use. A cost-sharing initiative lead by General Motors will result in more than 5,300 home and workplace charging stations installed in Michigan as the state prepares for the introduction of new electric vehicle technology\textsuperscript{24}.

\begin{thebibliography}{99}
\bibitem{1} http://www.betterplace.com/the-solution-charging
\bibitem{2} http://www.betterplace.com/the-solution-switch-stations
\bibitem{3} http://www.geindustrial.com/products/static/WattStation/
\end{thebibliography}
Responses to Survey

Austin, TX

How your city expedites the process for permitting electric vehicle charging stations?

We have not yet established the process for expedited permitting of EV charging stations; we will be meeting about this in November. However, we currently have a special inspection program with expedited permitting for new HVAC systems in existing homes. Our electrical ordinance allows us to establish additional programs like this. We will be happy to share our process for EV charging stations once we have developed it.

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

The Mayor of Austin, Lee Leffingwell, called for strong leadership from the United States Senate to advance the wide-scale deployment of electric vehicles and to develop the infrastructure needed to support them. Reference the memorandum written to the senate

http://www.electrificationcoalition.org/Austin_Support.pdf

We currently have in place a rebate program to encourage residents in our service territory to become PEV owners: http://www.ci.austin.tx.us/cleancities/electricvehiclerebate.htm

With City Council approval pending, we expect that beginning January 1, 2011, the Central Texas Clean Cities Electric Vehicle Incentives program will no longer offer incentives for electric cars (the program will still offer incentives for scooters, motorcycles, LSVs, golf carts and bicycles). As an alternative, the Austin Energy Plug-In Partners Pilot Program will offer home charging station incentives to people who buy or lease Plug-in Electric Vehicles (PEVs). Austin Energy customers who have already purchased or will buy PEVs before the end of the 2010 calendar year will be eligible to participate in the new pilot program.

The Austin Energy Pilot residential Program will be designed to provide the most affordable, reliable electricity for everyone, and so AE can develop a smart charging system that will give PEV drivers greater control over their charging. It will be set up to start with home installations for GM Volt and Nissan Leaf Pilot Version 1.0 Components Include:

- Free installation of Level 2 EVSE
- Up to a $1500 rebate for installation costs
- AE has selective control of charging
- AE collects data on driver behavior
At some point we will try a Version 2.0 of the Pilot which might include:

- Free maintenance on EVSE
- Free Emergency Service
- 2-day Installation including permitting, installation and inspection

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

Currently AE is working on finalizing a contract with Coulomb to provide free charging stations, under a DOE FOA-28 stimulus grant, for installation in public areas which can include the public parking areas of key businesses in our service territory and we expect many local businesses to take advantage of this offer.

Response emailed from: Austan S. Librach, P.E., AICP, City of Austin, Director of Emerging Transportation Technologies

Boston, MA

How your city expedites the process for permitting electric vehicle charging stations?

No examples provided

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

Responses are not official in anyway and what I have to comment on is strictly proposals and potential next steps. The City of Boston is engaged in a Northeast Regional Electric Vehicle Partnership. This consists of Philadelphia, NYC and Boston. There was a $50,000 grant given to these three cities as a whole to facilitate permitting and this is being housed primarily in NY. Currently, however, there is no single entity charged with ensuring the success of electric vehicles in any of these cities. As such, there is a clear opportunity for close coordination among major manufacturers, utilities, and the cities of New York, Boston, and Philadelphia to implement actions that address the needs of early adopters. There has been a regional initiative enacted recently on behalf of RGGI, I believe to help facilitate future plans for EV adoption along the coast but I do not have details.

Boston will be launching a pilot funded by the cities (environment dept.) of three EV vehicles slated for this spring-time, at which time we will be putting out an RFP for future station infrastructure. We have encouraged the implementation of EV stations in our off-street
parking garages and developments for years in your TAPA agreements so we will be following-up with these to see if transportation mitigation and line items were met in each development...this should help infrastructure and workplace implementation. Additionally we have already signed a deal for an EV charging station to be put downtown just off street in an abandoned gas station lot= this will also accommodate indoor bike parking.

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

We will be discussing the role of a number of different vehicle manufacturers as well in the weeks to come. Massachusetts already is slated to receive a roll-out of Nissan Leafs this time next year, and has in the past utilized two electric plug in stations at commuter rail stops.

Response emailed from:
Rachel Szakmary, Transportation Planner, Boston Transportation Department

Eugene, OR

How your city expedites the process for permitting electric vehicle charging stations?

Permitting will not be a barrier Oregon has a statewide energy code. All cities and counties must adhere to this code; they can have codes that go beyond the state code but not less. In 2008 the state Building Codes Division released permitting and inspection protocols for EV infrastructure. You can find more information at the link provided below.

http://www.cbs.state.or.us/external/bcd/notices/Adopted_Rules/092608_vehiclestations_tr.pdf

Residential permitting was further enhanced with laws enacted this year. Oregon has a minor label program that allows certified contractors participating in the program to install eligible equipment without going through the traditional permitting and inspection process. In most cases this will allow for little to no wait time for the consumer. See the link below for more information. https://minorlabels.dcbs.oregon.gov/

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?
Accelerating transition is important and increasing charging stations, and recommendation install charge stations in new housing. We have less control over adoption. Pilot program to install charging stations in Eugene. The Mayor of Eugene believes that it is very important to be considered a leader in PEVs.

We actively solicit grant opportunities. The EV Project charging stations will be installed in October November. Eugene is working with Ecotality. Electrifying I-5 corridor, from Eugene to Seattle with several dozen charging stations. Target areas are private properties mainly-malls and supermarkets for 220 chargers. There will be a series of “level 4” 440, on the corridor. State leadership, the Governor’s Alternative Fuel Vehicle Infrastructure Working Group, has helped to ensure unity of effort.

**What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?**

No examples provided.

Response provided from Eugene interview with Rocky Mountain Institute:

Matt McCrae Climate and Energy Action Coordinator, City of Eugene Manager’s Office

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**Houston, TX**

**How your city expedites the process for permitting electric vehicle charging stations?**

No examples provided

**What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?**

No particular city or State policy was sited as being key to Houston’s success. Their focuses lies more in the focus on working with private investor to create business models that will be mutually beneficial for city government, local citizens and local business.

The City of Houston is working with: Center Point, ERG Energy and Ecotality to set up cost shares to minimize the barriers to entry for electric vehicle owners. Center Point set up a cost share in a multi family complex. James Tillman is sited as a key player in developing these type of relationships.
Houston’s other main recommendation was to use Arc GIS to create consumer demand overlays to more accurately outline where EVCS will be needed in the future. These were the factors ECOTality provided to us for mapping early adopters.

1. Find the latest Travel Survey for Houston.
   - Average Daily Vehicle Trips for all types of vehicles
   - Average Vehicle Trip Lengths for all types of vehicles
   - Percentage of Daily Car Trips by Purpose
   - Vehicle Trip Length by Car by Purpose
   - Numbers of Vehicles per Household
   - Percent of Vehicles by Vehicle Age
   - Non-Work Trips at Peak Periods
   - Projected EV Sales in the Houston area.

2. Where Potential EV owners might live?
   - Identify their Destinations (Major employment centers, but no specifics)
   - What are the routes that are taken to these Destination zones?
   - Household Geographic boundaries for the following:
     - Households with double the median family income of $54k.
     - Households living in single family dwellings
     - Households that own 2 or more vehicles
     - Locations of Hybrid vehicle registration
     - Education – People over 25 with Bachelor's Degree
     (we used 40+ instead based on a Deloitte study)

Spatial Comparison shows the railway public transit options consumers have in Houston, Chicago, and NYC. This was meant to illustrate that when gas prices increase, citizens in other cities have more substitute options available versus in Houston, so for someone who wants to be green or save on gas in the future, in Houston they are perhaps more likely to buy electric vehicles.
Spatial Comparison: Houston is a Driving City

New York City

Chicago

10 miles

Houston

10 miles
Basic map by demographics (Urban, 40-45, 100K+ Income) to show likely areas of demand

Phase I EV Consumers:

Demographics:
Urban
Median Ages: 40 - 45
Income: $100,000 +
Nissan Leaf hand-raisers by zip code – in red the zips with most. Importantly, the rural zips are much larger, so the inner loop zips will be particularly important.
What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

Locations we can target for charging stations. In particular, the yellow business locations are only those that fell within the demographic
Furthermore, they were larger corporations with green reputations:


Bruce Haupt City of Houston Finance Department responded via telephone interview

Knoxville, TN

How your city expedites the process for permitting electric vehicle charging stations?

The PowerPoint presentations that were delivered at a Tennessee Valley Authority EV conference in Nashville September 2010 are at: http://www.tvafuelsolutions.com/

They outlines how and why the State took over EV permitting in Tennessee. In a nutshell, they filed an emergency ruling to capture the process until each city had adopted the 2008 NEC Code. In December, those cities that have the 2008 NEC in place (Knoxville) and have received inspection training from the State will take over EV permitting for their jurisdictions. The permitting is exactly like a normal electrical permit: the car dealer refers a trained electrician at point of sale, he goes to the house, insures the garage has 220 V or better (will be in the case with newer homes, but older homes may require a new breaker installation), files the permit with Building Inspections, and city inspectors come out once - after installation - to approve. The idea is to keep it consistent with any new electrical service process, to reduce confusion. If you would like to follow up directly with the State of TN, Patrick Merkel (patrick.merkel@tn.gov) is very helpful.

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

We plugged the story once to the press, and they took over from there - they call monthly for updates; in the past 6 months they've run about 3-5 stories (newspaper, TV) and it has generated a great deal of residential interest. The problem has not been publicity or inspiration; it's been having enough project details to keep them happy!

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

Incentives for Business: Here we're not quite there enough to be in an advisory role. Currently, we’re working with our utility to develop an annual cost estimate for hosting. At
this point, since only utilities can sell power here, electricity will be provided at cost to the hosting businesses. They will have to do their own cost benefit analysis from there, to be able to see if it makes sense as a marketing tool. What we don’t want is to host a forum for ECOTality, promote the charging, and have no numbers to be able to answer questions with! We finally received ECOTality’s commercial project contract (attached), which was also a piece we needed prior to putting our Chamber behind promotion.

As you can see, we’re in process development ourselves; we’ve started mining the west coast for best practices and relying on our local Clean Fuels Coalition (Project Get Ready) to help establish a framework for successful EV deployment outside of the ECOTality project.

Response emailed from Susanna Bass, City of Knoxville, Program Manager Sustainability

Oregon Department of Energy

**How your city expedites the process for permitting electric vehicle charging stations?**

Oregon has a statewide energy code. All cities and counties must adhere to this code; they can have codes that go beyond the state code but not less. In 2008 the state Building Codes Division released permitting and inspection protocols for EV infrastructure. You can find more information at the link provided below.

[http://www.cbs.state.or.us/external/bcd/notices/Adopted_Rules/092608_vehiclestations_tr.pdf](http://www.cbs.state.or.us/external/bcd/notices/Adopted_Rules/092608_vehiclestations_tr.pdf)

Residential permitting was further enhanced with laws enacted this year. Oregon has a minor label program that allows certified contractors participating in the program to install eligible equipment without going through the traditional permitting and inspection process. In most cases this will allow for little to no wait time for the consumer. See the link below for more information

[https://minorlabels.dcbs.oregon.gov/](https://minorlabels.dcbs.oregon.gov/)

**What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?**

Oregon has had an Alternative Vehicle tax credit since the early nineties as part of our Business Energy Tax Credit (BETC) and Residential Energy Tax Credit (RETC) programs. The incentive for the BETC is 35 percent of the incremental cost between a baseline vehicle and the alternative fuel vehicle. The RETC incentive is typically $1,500. This coupled with the federal IRS tax credits makes the vehicles much more attractive for new buyers. Information on these credits can be found at the links below.

http://www.fueleconomy.gov/feg/tax_ev.shtml

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

The programs mentioned above also can be used for charging infrastructure. See links below.

Response emailed from Rick Wallace, Senior Policy Analyst, Oregon DOE

Oregon Department of Transportation
How your city expedites the process for permitting electric vehicle charging stations?

A good place to start would be the "Deployment Guidelines" document on the website below. You should check out the Oregon Building Codes agency's "Minor Label" program at:

http://cbs.state.or.us/external/bcd/notices/ElectricVehiclePermitNR_6-11-10.pdf

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?


What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

No examples provided.

Response emailed from Art James, Innovative Partnerships Project Director, Oregon DOT

Philadelphia, PA
How your city expedites the process for permitting electric vehicle charging stations?
No process as of yet. Along with NYC and Boston, we are in the process of hiring an EV policy coordinator who will examine the permitting processes in each city and suggest opportunities to make them more efficient. The multi-city coordinator will also look at opportunities for Philadelphia, NYC, and Boston to promote travel by EV between the cities.

**What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?**

Pennsylvania residents who purchase EVs are eligible for a $500 alternative fuel vehicle rebate from the Department of Environmental Protection (DEP).

**What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?**

Be more attractive for federal funding by being part of a interstate corridor that is robust with electric vehicle charging stations. With Federal Co-authorship the private sector is more likely to share costs. Also, the Mayor’s Office of Sustainability applied for grant money from the state to help our two car sharing companies (Zipcar and PhillyCarShare) pay for installation of EV chargers for their car share fleets.

Sarah Wu, Outreach and Policy Coordinator, Philadelphia’s Office of Sustainability responded via telephone

**Raleigh, NC**

**How your city expedites the process for permitting electric vehicle charging stations?**

Our expedited permitting for charging units installed in a single-family residence take 1 hour to process. After studying the code requirements we determined that there was little need for a detailed code review for this installation. We decided that the electrical field inspectors would be trained on the new technology and eliminate the plan review. By doing this the permit can be issued while you wait. We process these through our stand-alone permits. The link is

[http://raleighnc.gov/search/content/CityMgrDevServices/Articles/StandAlonesResidential.html](http://raleighnc.gov/search/content/CityMgrDevServices/Articles/StandAlonesResidential.html)

The key to our success is getting up to speed on the code requirements and then training our field staff.
Multiple units installed in commercial applications are a different situation. We require an engineered design with complete plans. We review these plans for code compliance and process them through our Regular Commercial Review process. Each review cycle is generally 3 weeks. We treat these differently based on a cost verses safety benefit analysis. In the residential case the cost of requiring detailed plans is more than the cost of changing a bad installation. Also with proper training the electrical inspector will insure a safe installation. The commercial installation is generally more costly and more complex. Not only are there higher code requirements, local ordinances will also apply. ADA and other safety issues come into play. Location becomes an issue and mistakes become costly. So we have decided to perform a complete review before issuing permits.
Inspections Department

City of Raleigh Permit Application Process for Electrical Vehicle Charging Station (EVCS) Installation; Residential and Commercial.

If you own an electric car, where will you charge it? At home, at the mall, at the office or at your favorite restaurant? To ensure a path for the emerging technology and enable the installation of an Electric Vehicle Charging Station (EVCS) in the City of Raleigh, the City of Raleigh's Office of Sustainability and the Inspections Departments would like to provide you with some tips to ensure your charging station is installed with minimal effort.

Vehicles with internal charging units that plug into existing 120 volt receptacles do not require modification to your electrical system. The installation of a charging station directly wired to the electrical system will require a permit. Single unit installations will be processed through the stand alone permit process. Multiple unit installations will be processed through the Commercial Review process and will require additional plans and documentation. The following information is to help ease the permitting process.

Information required for the Permit Application:

- Proposed Work ("Install an electric vehicle charging station.")
- Project Address (street #, PO Box NOT ALLOWED)
  Note: each charging station (unless located inside a structure or attached to a structure) needs an independent address. Contact the Planning Department prior to applying for a permit to obtain the appropriate address.
- Plot plan (showing location & proposed work/identify station or stations)
- Contractor Information
  - Licensed Contractor – needs
    - City of Raleigh Business License
    - Contractor License #
  - Homeowner (listed as contractor) – needs
    - Contractor License Exemption Form
**Residential EVCS Installation (Single Unit Only)** The installation of a residential single unit EVCS will be issued as a stand alone electrical permit. This is to help ease the permit process. The homeowner can opt to install the station or have an electrical contractor to install it. If the homeowner is listed as the contractor, then a Contractor License Exemption Form must be filled out.

**Commercial EVCS Installation**

Licensed electrical contractors are required for commercial installations. The installation of a commercial single unit EVCS may be issued as a stand alone electrical permit. However, the installation of Multi-Unit EVCS will be issued through the Commercial Review process. Units installed on the right of way will require an encroachment agreement from the Public Works Department.

**Additional Information for Commercial Multi-Unit EVCS Installation:**

- Proposed Work {"Install multiple-unit electric vehicle charging stations."}
- Engineer Design of Multiple System (Information required)
  - Manufacturer data sheet
  - Third party listing
  - # of units to be installed
  - Load calculation with details back to the power source
- Americans with Disabilities Act must be considered in all design submissions

**Steps to obtaining a permit:**

- Fill out all the required information on the permit application
- Fees are due when the permit is issued
- Submit the application

**Common Permit Application Oversights**

- Address problems (must match)
- Incomplete application
- Contractor data incomplete
- Total cost not included or incorrect
- No signature
- Lot needs recombination
- Plot plan not sized to scale
- No proof of Workman's Compensation
- Need City of Raleigh Business License

Or visit raleighnc.gov -- Click on Departments, migrate down and click on Inspections
What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

As a motivator Raleigh is providing free charging at our stations. In addition we are taking promotional opportunities at our local events. We have had several showing of electric vehicles to include demonstration rides, with support from Toyota and Nissan. In addition we have taken the initiative with builders and developers to encourage making installations as a marketing strategy. Malls and shopping centers have been very receptive to this idea.

The City has made presentations to various groups around our area. Not only those that are interested in green initiatives but tradesmen that will be working with the new technology.

We have done training for regional electrical contractors and electrical inspectors. When the local car dealers start selling electric vehicles we plan to be advocates for owners to encourage major employers to provide charging stations for these employees. Paying for the units and installations is a hurdle that needs to be overcome. We have applied for several grants and have received commitments that allow us to purchase equipment. Installation costs are being covered by our City Council on City owned property and the public streets. We are currently in the bidding process to get several units installed.

The City of Raleigh prepared itself by creating a Project Get Ready Task Force involving stakeholders from multiple city departments: Office of Sustainability, Inspections/Permit Department, Administrative Services, Public Affairs, Public Works, Fleet Services, Construction Management, Parking Division

External stakeholders included: Advanced Energy, Progress Energy & Rocky Mountain Institute

Raleigh also actively sought grants from:

- Energy and Efficiency Conservation Block Grant (US DOE EECBG)
- Clean Fuel Advanced Technology Grant (CFAT- NC DOT)
- Clean Cities Grant (US DOE)
- Raleigh Sustainable Energy Fund

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

Raleigh began public awareness and education campaign that included:
Media and City webpage coverage outlining actions taken city task force, Co-sponsoring educational forums with local business and educational institutes

Response emailed by both: Frank Olafson, Permit Office Administrator, Inspections Department; and Nelson Daniels, Senior Sustainability Technician, Office of Sustainability, City of Raleigh

Salem, OR

**How your city expedites the process for permitting electric vehicle charging stations?**

Here in Salem we use the state codes and standards. The best point of contact for you to get further information is Dennis Clements, Chief Electrical Inspector for the State’s Building Codes Division. He and I have exchanged e-mails and he knows you may be contacting him.

Dennis Clements, Chief Electrical Inspector

Oregon Building Codes Division, Policy & Technical Services

503-378-4459

[Dennis.L.Clements@state.or.us](mailto:Dennis.L.Clements@state.or.us)

Also, from Gabrielle Schiffer, the Green Building Services Coordinator for the Oregon Building Codes Division, here are the links to:

- Statewide alternate method on demand factor tables for multiple charging stations:

  [http://www.cbs.state.or.us/external/bcd/programs/electrical/alternate_methods/09-01_am.pdf](http://www.cbs.state.or.us/external/bcd/programs/electrical/alternate_methods/09-01_am.pdf)

- Rule on inspection protocol (918-311-0065)

  [http://www.cbs.state.or.us/external/bcd/rules/311.pdf](http://www.cbs.state.or.us/external/bcd/rules/311.pdf)

- Press release on use of minor labels for residential charging installations


**What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?**

No examples provided
What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

No examples provided.

Response emailed by Robert D. Chandler, Ph.D., P.E., Assistant Public Works Director, City of Salem

San Francisco, CA

How your city expedites the process for permitting electric vehicle charging stations?

We are in the process of developing a summary of the permit & installation process for San Francisco residents and we’ll happy to share it with you, hopefully in the near future. For installation of residential EV chargers, there is not a specific “EV charger” permit. For normal jobs (i.e., where no service upgrade is needed), all that is required is a standard electrical permit.

These permits are issued on a same-day/over-the-counter basis, or for a certified electrician licensed for work in San Francisco, can be issued instantly on-line. The Department of Building Inspection’s policy is to conduct inspections within 48 hours of request. In a more general sense, the consumer-friendly information page and EV-ready checklist we are preparing for the City’s and the permit office’s websites will help residents move through the process easily.

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

We are planning to institute a program to rebate permit fees for the first 500 San Francisco residents who install EV chargers. The State of California Clean Vehicle Rebate Project will provide purchasers of qualifying plug-in vehicles with rebates of up to $5,000.

What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?

Our regional air quality agency, the Bay Area Air Quality Management District, has established a new $5 million EV infrastructure grant program that provide grants for EV charger installations at commercial locations as well as residences. You also asked about Fire Department/first responder training. At this point, our First Department has not conducted
the training. Originally, this had been planned for October through a program with General Motors. However, the GM program has been combined with a larger, National Fire Protection Association EV Safety program, and the new date for training hasn’t yet been set. See http://www.evsafetytraining.org/ for information about the NFPA program.

Response emailed by Robert Hayden, Clean Transportation Advisor, Department of Environment, City and County of San Francisco

Seattle, WA

How your city expedites the process for permitting electric vehicle charging stations?

The Department of Planning and Development (DPD) is issuing a Client Assistance Memo, with Seattle City Light’s input, to help guide citizens in single family, multi-family, commercial buildings, and new construction through the process of establishing electrical vehicle charging infrastructure

- Recommends evaluation of existing electrical system by a State licensed and bonded electrical contractor
- Provides information on different levels of charging infrastructure
- DPD developed a preliminary assessment form for EV capacity
- Seattle City Light provides client assistance in situations where new or upgraded electric service is needed
- Currently permits are available on-line or over the phone with same day inspection

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

- Seattle has been fortunate to receive significant investment in EV including an American Recovery and Reinvestment Act (ARRA) grant to develop a robust charging network to support EVs. This Federal grant is funding the EV Project. As part of this grant, Nissan Leaf and Chevy Volt buyers who qualify to participate in the EV Project will receive a free residential charging station and most if not all of the installation costs will be paid for by the EV Project. The EV Project will collect and analyze data to evaluate the effectiveness of charging infrastructure.
- Seattle also received funding through a Clean Cities Coalition grant to install public charging stations on public property.

- The Federal government is providing a $7,500 rebate to EV early adopters. Washington House Bill 1481During the 2009 session, the Washington Legislature passed House Bill 1481 outlining a variety of provisions to support electric vehicles and electric vehicle infrastructure in the state. It required the Puget Sound Regional Council (PSRC, the region’s Municipal Planning Organization) to put together and EV model ordinance and regulations to assist local governments in facilitating EV adoption.

The City of Seattle worked with the Puget Sound Regional Council to create maps using travel demand modeling and other trip information to hypothesize where EV owners would likely travel to and build a regional charging station network to better serve EV users. Other efforts being undertaken at the Puget Sound regional level include PSRC’s development of a model ordinance and guidelines, as well as development of state-wide signage and way finding design standards. City of Seattle as a facilitator

- The City of Seattle is committed to doing everything it can to make sure the city is "plug-in ready," such as producing Client Assistance Memos (CAMs), streamlining permitting, identifying necessary building and land use code changes, installing charging stations in the right-of-way, producing a parking ordinance, providing education on the benefits of EVs, coordinating with surrounding cities and King County on a regional EV infrastructure strategy, including way finding and increased overall access.

-City of Seattle EV partnerships.

In April 2009 the City of Seattle and Nissan North America signed a Memorandum-of-Understanding (MOU) pledging to work together to promote the development of electric vehicles and charging infrastructure. Under the MOU Nissan will supply electric vehicles in Seattle in 2010, promote electric vehicles through education and incentives, and work with local governments, businesses and nonprofits to develop a battery-charging network across the Seattle area. In August 2010 the city entered into a partnership with Ford Motor Company to promote EVs in Seattle.

- City fleets. The City of Seattle's fleet is acquiring 35 EVs and will install 26 charging stations in the Seattle Municipal Tower. A total of 36 charging stations will be installed for the city fleet's use. Additional 22 charging stations will be installed on public property and available for public use.

**What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?**

As part of the regional EV strategy we are having conversations with businesses in strategic locations that are proposed to be a part of the regional EV charging infrastructure network.
Response by email from Sandra Pinto de Bader, Environmental Sustainability Coordinator, City of Seattle Office of Sustainability and Environment

Vancouver, Canada

**How your city expedites the process for permitting electric vehicle charging stations?**

The City of Vancouver, focused on setting permitting policy for residential areas first, and as the permitting program grows make sure it does so skillfully. Build education systems so that capacity at the permitting office doesn’t have to grow exponentially.

Vancouver’s Green Homes Program has mandated that all new homes be equipped with a cable raceway that runs from the building’s electricity panel directly to the garage, where an empty outlet box will be supplied. This little bit of infrastructure will make the future installation of an electric vehicle charging system a snap.

**By-law Language:**

12.2.2.10. Cable Raceway

1) Each dwelling unit shall have a cable raceway leading from the electricity circuit panel to an enclosed outlet box in the garage or carport.

2) A raceway not smaller than size 21 shall be provided to accommodate future conductors of a separate branch circuit intended to supply a future receptacle for use with the electric vehicle charging system.

3) An outlet box for the receptacle referred to in Sentence (2) and approved for the purpose shall be provided in a parking space or a parking stall of a storage garage or carport intended for use with the electric vehicle charging system.

4) The raceway described in Sentence (2) shall be installed between the dwelling unit panel board and the outlet box referred to in Sentence (3).

The City of Vancouver now requires 20% of parking stalls in new multi-family buildings to contain charging receptacles, and requires sufficient space in breaker rooms for additional electrical panels. This provides a baseline level of charging infrastructure now to support early EV adopters, as well as builds in the capacity to support future EV market adoption (note: applies to any building permits received after January 1, 2011 to allow time for land costs to adjust).

Part 13 of the Vancouver Building Bylaw has been updated accordingly (see paragraphs below). These bylaw changes are intended to be responsive and dynamic and will be reviewed annually.

13.2.1.1. Parking Stalls
1) Each one of 20% of the parking stalls that are for use by owners or occupiers of dwelling units in a multi-family building that includes three or more dwelling units, or in the multi-family component of a mixed use building that includes three or more dwelling units, must include a receptacle to accommodate use by electric vehicle charging equipment.

13.2.1.2. Electrical Room

1) The electrical room in a multi-family building, or in the multi-family component of a mixed use building, that in either case includes three or more dwelling units, must include sufficient space for the future installation of electrical equipment necessary to provide a receptacle to accommodate use by electric charging equipment for 100% of the parking stalls that are for use by owners or occupiers of the building or of the residential component of the building.

For more information:

Read about work City of Vancouver has done to to support the adoption of EV’s - webpage

View the complete Electric Vehicle Charging Infrastructure Deployment Guidelines.

What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?

The British Columbia Institute of Technology (BCIT) is joining forces with the City of Vancouver and the Rocky Mountain Institute (RMI) to help communities prepare for the use of Electric Vehicles (EV) and Plug-in Hybrid Electric Vehicles (PHEV).

The City of Vancouver is moving closer to being an electric vehicle friendly city, supporting the use of electric vehicles as part of its sustainability goals in the following ways:

- Requiring all new single-family homes and off-street bicycle storage rooms to have dedicated electric plug-in outlets;

- Requiring charging infrastructure for 20% of all parking stalls in new condo buildings;

- Leading a electric vehicle charging infrastructure pilot program for home, work and on the go as part of a broader conservation collaborative with BC Hydro;

- Encouraging all major automakers to bring their new electric vehicles to Vancouver as soon as possible;

- Owning the first Plug-in Hybrid Electric Vehicle (PHEV) deployed in a Vancouver Fleet. It is a stock Toyota Prius Hybrid with a Plug-In Conversion Module that increases the car’s electrical capacity by more than ten times;

Signing a non-exclusive agreement with Mitsubishi, BC Hydro and the BC Government to test what Mitsubishi describes as the world’s first production-ready, highway-capable electric car
to be produced this year in Japan. The i MiEV has joined the City's fleet in Nov 2009 for demonstration and evaluation purposes. Read letter from Vancouver’s Mayor to Mitsubishi factory workers; and

Working with representatives from Renault-Nissan, the Province of BC, and BC Hydro to identify opportunities to promote the use of zero-emission vehicles in Vancouver and other areas in BC.

**What strategies are you employing that provide incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use?**

When businesses are being reluctant to cost share remind them of the City's intent. Show stakeholders we as a city are doing our part removing barriers; remind them they need to contribute/follow city leadership

Brian Beck, P.E. Project Manager, Sustainability Group, City of Vancouver responded telephonically
Sample Request for Information Letter

City of XXX
Office of Sustainability
Sustainability Liaison

Subject: Electric Vehicle Permitting Request for Information

Dear XXX,

Permitting has been identified as a major hurdle for us in ensuring the successful growth of the electric vehicle market. As such, we would like to analyze the procedures you have developed for your residents to follow once they become electric vehicle owners; in order to prepare our permitting group to be as effective as possible as the vehicles begin to hit the market in 2011. We are particularly interested in learning about:

- How your city expedites the process for permitting electric vehicle charging stations?
- What city and or state policies have encouraged residents of your municipality to become electric vehicle owners?
- Strategies that provided incentives for local businesses to invest in electric vehicle infrastructure for commercial electric vehicle use.

Please forward any relevant information your office can share to Jules Toraya, jtoraya@atlanta.ga.gov. Jules will follow-up with you directly to schedule a call with you or the appropriate member of your staff to discuss this request in greater depth.

Sincerely,

Mandy Mahoney
Director of Sustainability
City of Atlanta