

Transportation Advisory Board
of the Metropolitan Council of the Twin Cities

ACTION TRANSMITTAL

No. 2011-34

DATE: March 9, 2011
TO: Transportation Advisory Board
FROM: Technical Advisory Committee
SUBJECT: Minnesota Pollution Control Agency Proposal for CMAQ Funding for Electric Vehicle Charging Stations.

MOTION: That the TAB request that MPCA work with the region to further develop the project proposal particularly with regard to the process for determining the location of the charging stations and for the TAC F&P Committee to prepare and forward to TAB a TIP amendment when that work has been completed.

BACKGROUND AND PURPOSE OF ACTION: The TAB requested that the TAC Funding & Programming Committee evaluate MPCA's request for \$500,000 in CMAQ funds from the regional solicitation to install electric vehicle charging stations in the Twin Cities region. The TAC Funding & Programming Committee reviewed the proposal on February 17 and determined that the project is eligible for CMAQ funding and that it would not score well or fit particularly well within the existing CMAQ categories of transit expansion or system management. However, the project does appear to be a cost-effective way to reduce automobile emissions.

The TAC Funding & Programming Committee voted to recommend delaying a decision on funding this project until more information is available as to the location of the charging stations and the process used to determine those locations. There was also a desire for MPCA to show more coordination with local units of government and to provide more information about the source of the local match. The TAC supports the findings and recommendation from the TAC Funding & Programming Committee and took further action to form a small advisory group to assist the MPCA in preparing a TIP amendment that more clearly identifies the potential locations for the electric vehicle recharging stations. Additional background material is attached.

ROUTING

TO	ACTION REQUESTED	DATE COMPLETED
TAC Funding & Programming Committee	Review & Recommend	February 17, 2011
Technical Advisory Committee	Review & Recommend	March 2, 2011
TAB Programming Committee	Review & Recommend	
Transportation Advisory Board	Review & Adopt	

Transportation Advisory Board of the Metropolitan Council of the Twin Cities

TO: TAC Funding & Programming Committee
FROM: James Andrew, Senior Transportation Planner
DATE: February 11, 2011
RE: MPCA Request to Fund Electric Vehicle Charging Stations.

Pat Bursaw and Kate Garwood received comments from some members of the CMAQ Transit Expansion and CMAQ System Management scoring committees on the proposal by the Minnesota Pollution Control Agency and whether it fits in with the established CMAQ application process. There was not a unanimous agreement on what exactly to do with the proposal by the MPCA to set aside \$500,000 in CMAQ funding to implement electric vehicle charging stations in the metropolitan area. The following short summary represents the major observations regarding this request.

There is widespread agreement that this proposal is eligible for CMAQ funds but that it would not score well within any of the existing categories (Transit Expansion or System Management) as it is not a transit project and does not address congestion like a System Management project. There is also agreement that the project has many merits. It has a high cost-benefit ratio as compared to other projects funded with CMAQ and is relatively low cost. However, there are different opinions as to how the TAB should proceed with this proposal:

- One proposal is to establish a separate category in CMAQ for this kind of project that measures the cost-effectiveness of emissions reduction in addition to other criteria that would have to be developed.
- The second proposal is to fund the project outside of the regular process, perhaps using a setaside of CMAQ funds from the upcoming solicitation or by reprogramming withdrawn projects from previous solicitations.

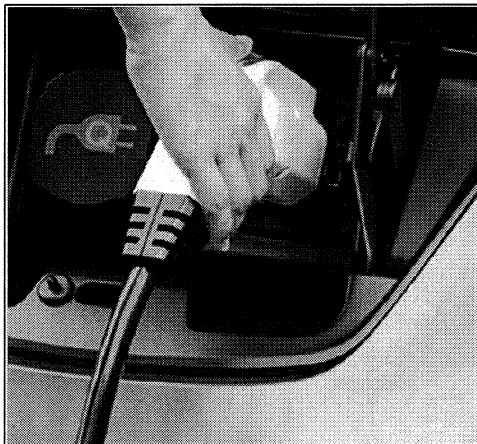
There are some drawbacks to each option. The first option would require a significant amount of time that may not be available this late in the process of developing the 2011 Regional Solicitation. If an application were developed, it would also require MPCA to coordinate with all potentially affected counties and cities on where the charging stations would be located and how the matching funds would be handled. The second option would be easier to implement but it would potentially take funding away from the overall CMAQ funding category.

While not a universally-shared opinion, the scoring committee chairs lean toward the second option of finding additional funding outside of the regular process because it is more feasible and the project is relatively small and cost-effective. They felt it would be useful if PCA, perhaps working with the Interagency Air Quality Committee, could provide additional background information to TAB as to future emissions issues and the benefits of programs such as these toward addressing them, and what other measures PCA might propose. A prioritized list of measures they are exploring would be useful in the future, so that these kinds of initiatives are better understood before they are proposed to be funded.

Federal CMAQ Funding Request: Electric Vehicle Charging Station Infrastructure

Background

Drive Electric Minnesota is a partnership of local and state government, our largest utility, private business and nonprofit entities working in collaboration to bring electric vehicles (EVs) and plug-in charging infrastructure to Minnesota. This coalition seeks to install publically available plug-in charging stations and to spur the early procurement of electric vehicles by local government. The planned installation of electric vehicle supply equipment (EVSE) will result in approximately 30 on-street, parking ramp and surface lot charging stations. In addition, four solar-powered stations are planned for inclusion in the Energy Innovation Corridor adjacent to the light rail corridor, between the Cities of Saint Paul and Minneapolis. Early procurement of Ford Azure Transit Connect electric utility vehicles has resulted in the first of these vehicles being delivered to the City of Saint Paul in December 2010.



Why promote use of electric vehicles (EVs)? EVs emit no toxic air pollutant emissions at the tailpipe and when charged with renewably generated electricity there is also zero emissions during the electric energy generation.

Reduced fuel-equivalent costs, typically at 2 to 3 cents per mile, less maintenance including freedom from oil changes due to fewer moving parts can be coupled with use of locally-generated renewable wind sourced or solar electricity.

Funding Request

This request is for the allocation of \$500,000 from the non-competitive Congestion Mitigation Air Quality (CMAQ) program for use across the metro area to install electric vehicle charging infrastructure. With a 20% match of \$125,000 the total project cost proposed is \$625,000.

Rationale

Plug-in electric and plug-in hybrid vehicles from major manufactures will hit the US consumer vehicle market in model year 2011 for the first time. A limited number of public charging stations are in development in the Twin Cities, however for these low and zero emissions vehicles to gain market traction, we need to demonstrate a minimum level of public support and infrastructure. The \$625,000 will be used, after careful analysis, to fill gaps in the availability of public charging stations throughout the metro area. Approximately 60 stations at \$11,000 each (including administrative costs) will be installed in publicly owned parking ramps, on-street, and surface lots. Availability and locations of the charging stations will be promoted via electronic and social media, including smart phone and internet applications.

Jobs Creation

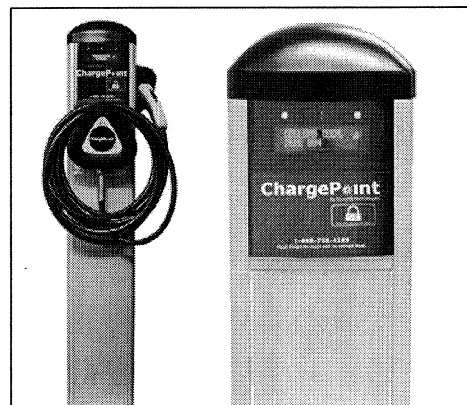
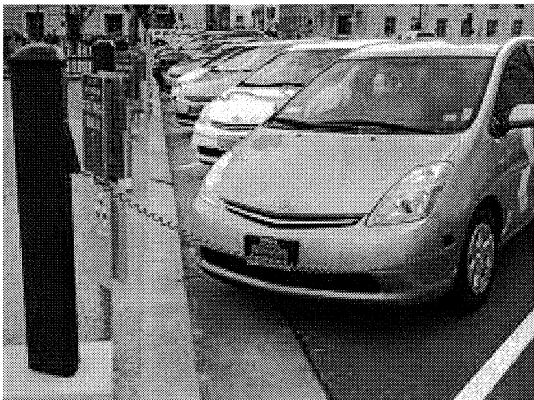
Installation of EVSE allows for further diversification of jobs created as a result of the MPO federal funding. Each plug-in charging station typically requires 8 to 12 hours of technical site review and installation labor depending upon the site conditions.

National Resources

To compete for upcoming federal funds, Minnesota (and its Twin Cities partners) must demonstrate commitment, as well as documentable progress, in being "EV Ready." Early support from the Transportation Advisory Board will reinforce the growing list of accomplishments and active projects of the Drive Electric Minnesota coalition.

Completion of Work

A statewide EVSE request for proposal process that resulted in a list of selected vendors has been completed. This combined with the intention of installing 'off-the-shelf' EVSE equipment will optimize the time needed for project completion.



Contacts:

Fran Crotty
Minnesota Pollution Control Agency
651 757-2297
fran.crotty@state.mn.us

Kevin McDonald, Supervisor
Minnesota Pollution Control Agency
651 757-2561
Kevin.j.mcdonald@state.mn.us

Bill Droessler
Clean Air Minnesota
Minnesota Environmental Initiative
612 334-3388 Ext. 103
bdroessler@mn-ei.org

Emissions Reduction Questions:

1. What level of CO, NOx and VOC emissions reduction can reasonably be expected from full implementation of this project?

The following chart reflects emissions reductions resulting from the installation of 60 plug-in charging stations for electric vehicles in the metro area to fill gaps in availability.

**VEHICLE EMISSIONS REDUCTION WORKSHEET (APPENDIX G)
Electric Vehicle Recharging Stations**

Year 3 Estimated Daily Usage of the Recharging Stations*				120	# electric auto trips
Estimated trip distance using electric vehicles recharged on site				22.2	miles
Year 3 Estimated Daily Electric Auto VMT				2664	
Equivalent Year 3 Estimated Daily Gas Auto VMT				2664	
GAS AUTO EMISSIONS GENERATED					
Average Weekday Auto Travel Speed:				30	mph
YEAR THREE					
	Emissions Factor (grams/mile)*	Daily Gas Auto VMT (miles)	Emissions (kg/day)		
CO Emissions	14.88	2,664	39.6		
NO_x Emissions	1.68	2,664	4.5		
VOC Emissions	1.39	2,664	3.7		
Total Emissions			47.8		
ELECTRIC AUTO EMISSIONS GENERATED					
Average Weekday Auto Travel Speed:					mph
YEAR THREE					
	Emissions Factor (grams/mile)**	Daily Electric Auto VMT (miles)	Emissions (kg/day)		
CO Emissions	0.00	2,664	0.0		
NO_x Emissions	0.00	2,664	0.0		
VOC Emissions	0.00	2,664	0.0		
Total Emissions			0.0		
NET PROJECT EMISSION REDUCTIONS					
	Gas Auto Emissions Generated (kg/day)	Electric Auto Emissions Generated (kg/day)	Net Emission Reductions (kg/day)		
YEAR THREE	47.8	0.0	47.8		
*Assumes occupancy of two vehicles per charging station per day.					
**Appropriate emissions factors are based on average speed.					

As seen in the Vehicle Emissions Reduction Worksheet, the project will reduce emissions by 47.8 KG per day.

2. What is the cost effectiveness of the emissions reduction? (total cost of the project per Kg/day CO, NOx and VOC reduced)

Cost Effectiveness = \$625,000/47.8 KG = \$13,075/KG/DAY reduction in CO, NOx and VOC emissions.

3. Who will be responsible for maintaining these stations? What happens with the money collected to use the charging stations?

As owners of the electric vehicle supply equipment (EVSE), used in the charging stations, the participating cities and counties will be responsible for their maintenance. EVSE vendors typically partner with local electricians should expert repair consultation or services be needed.

The Metro area cities and counties, that opt to participate in this project, will be responsible for collecting any fees from charging station users to cover maintenance and operating costs, in a similar manner as for parking meters. The fee assessed at the charging station will be determined independently by each participating jurisdiction. It is anticipated that the revenue collected will offset operations and maintenance costs. As with parking meters there are opportunities to collect fee amounts beyond the amount needed to maintain the stations especially for those parking spots in prime locations.

4. How does the timing of the availability of the CMAQ funds fit with MPCA's plans to leverage other funds to build these stations?

The U.S. Department of Energy (DOE) anticipates releasing a request for proposal (RfP) for their Clean Cities program, in the first quarter of 2011, which will include funding for the installation of charging station equipment and assistance with the procurement of electric vehicles for public fleets. Support for this CMAQ request will further demonstrate our regional commitment for increased migration toward use of electric vehicles. These investments are anticipated to provide favorable weighting toward our submitted DOE Clean Cities proposal during the next competitive process.

5. What is the market demand for EV recharging facilities?

According to the 2010 National Automobile Dealers Association (NADA) Report¹ vehicle registrations for plug-in electric vehicles (PEVs) are anticipated to be 2.8% of the total by 2015. For the approximately 150,000 annual registrations in Minnesota this translates into 4,200 new PEV vehicle registrations. NADA projects a progressive increase in the rate of EV production in future years. The cumulative number of PEVs anticipated on the road in Minnesota by 2015 is 12,450.

A recently completed needs assessment by Project Get Ready², a national collaboration of cities, local government units and businesses, determined that one charging station is needed for every 100 electric vehicles. This ratio indicates that a minimum of 125 plug-in charging stations should be installed in the Minnesota by 2015.

The Drive Electric Minnesota coalition has established a goal of installing 125 plug-in charging stations in the metro area in the next three to four years. In aggregate the Cities of Saint Paul and Minneapolis along with Ramsey and Hennepin Counties, will be installing approximately 30 plug-in publically available charging stations throughout 2011. The additional 60 plug-in charging stations, installed through this CMAQ proposal, will fill gaps in charging station accessibility for metro area EV drivers.

Placement of the plug-in charging stations will be determined by each participating metro area county or city, at locations within their respective jurisdictional boundaries. Submission of an application to the Department of Energy Clean Cities program, in early 2011, will be made on behalf of Drive Electric Minnesota coalition for funding the installation of a minimum of 35 additional plug-in charging stations within the Metro area.

6. What is the cost of maintaining the EV recharging facilities?

Each EVSE vendor lists optional costs related to networked data collection and billing management features for their charging equipment. These costs vary depending upon the equipment attributes. For example, if a charging station has the capability to read radio frequency identification (RFID) from a charge card and subsequently bill, there is typically a \$150 to \$400 annual service charge per station. There are comparatively less expensive EVSE systems that do not include networking capabilities for billing or energy use data capture that can be used, for example by publicly owned fleets.

EVSE maintenance is anticipated be minimal since this is primarily solid state electronic equipment with few moving parts. Occasionally the screens for the chargers may need to be wiped if for some reason they become opaque due to dirt accumulation. The attached plug-in cables will need to be checked for wear. Each EVSE vendor works in partnership with a local electrician company for consultation and service should it be necessary. Overall, the maintenance level for the EVSE is expected to be comparable to that of newer electronic parking meters.

The original equipment manufacturer warranty for EVSE is typically for two years. Some EVSE vendors provide efficient mobile repair and replacement services.

7. Is the MPCA working with a specific EV manufacturer?

The MPCA is not working with any one specific electric vehicle manufacturer. Through a MN Department of Administration open bid process four EVSE vendors were selected and subsequently included in a statewide contract. Local governments have the option to use these or other EVSE vendors.

Resource Citations:

¹ National Automobile Dealers Association Data 2010 Report. nada.org/Publications/NADADATA/default.htm

² Project Get Ready Menu projectgetready.com/resources/pgr-docs/project-get-ready-menu-draft