Lansing Board of Water & Light

Final Scientific / Technical Report

Plug-in Hybrid Initiative
DE-EE0003972

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Executive Summary

Below is our executive summary of our project which explains how the research adds to the understanding of the areas investigated, the technical effectiveness and economic feasibility of the methods or techniques investigated or demonstrated, and how the project is otherwise of benefit to the public.

Our main project objective was to implement Plug-in Electric Vehicles (PEV) and charging infrastructure into our electric distribution service territory and help reduce barriers in the process. Our research demonstrated the desire for some to be early adopters of electric vehicles and the effects lack of education plays on others. The response of early adopters was tremendous: with the initial launch of our program we had nearly 60 residential customers interested in taking part in our program. However, our program only allowed for 15 residential participants. Our program provided assistance towards purchasing a PEV and installation of Electric Vehicle Supply Equipment (EVSE). The residential participants have all come to love their PEVs and are more than enthusiastic about promoting the many benefits of driving electric.

Research in our program offered us an understanding of business's acceptance to an EVSE(s) at their site. We reached out to community partners and offered an EVSE(s) to governmental agencies, libraries, local shopping malls and eateries. Our program had many businesses welcome and allow the installation of an EVSE(s). These businesses want to be part of this new technology and see PEVs as part of our future. However, our program also experienced a great deal of resistance. Through education and perseverance from our project team we were able to install a total of 55 EVSEs; 16, residential, 9 work, 17 public and 12 fleet. Our project team did not anticipate the time and effort that was required to work with many business owners. Lack of education about the amount of power required to charge a PEV and the actual cost of the energy to their business was always an issue. Other had notions that employees would be angered because in some cases the PEV drivers would be receiving privileged parking and receiving a benefit others are not. These business owners also thought the expense of providing this benefit to employees would be difficult to account for. Our team experienced that the expense of the EVSE(s) along with the cost for the installation is a barrier

preventing many businesses from installing an EVSE(s), for public use, on their own. Some business owners also expressed that the time is too early to install charging infrastructure because there are not enough PEV driving employees and/or customers yet.

The technical effectiveness and economic feasibility of the methods or techniques investigated demonstrated that we were able to promote the purchase of PEVs in the greater Lansing area, but the economic feasibility is currently a barrier. The technical effectiveness of our project assisting with several purchases of PEVs, which led to many additional PEVs in our area that are not a part of our program. We believe this is due to the fact the people in our program were so happy with and excited about having their PEVs that they became ambassadors for the PEVs. Also, installing several, level 2 (240 V), commercial EVSEs, in the greater Lansing area, getting businesses to agree not to charge for the usage, providing opportunities to educate the general public on the benefits of owning a PEV and letting them experience seeing, riding in and even driving one. We did have technical problems with some of the "smart" EVSEs we purchased. This prevented us from collecting all the data we would have liked to collect. We are still working with the EVSE companies to get these problems corrected.

The economic feasibility was not as successful. Many installations, especially smart, level 2, commercial EVSEs were so expensive the benefits could not justify the cost nor could the cost be recouped by charging reasonable fees for the parking. We found, in many cases, it would be better for the businesses to allow PEV owners to use existing outdoor 120 volt receptacles for charging their vehicles. The benefit for short term visitors would not be as great, but the public relations benefit would be almost as good.

The main project objectives of implementing electric vehicle charging infrastructure and reducing barriers for PEV adoption are direct benefits to the public. When you think of PEV adoption, the benefits of moving towards transportation electrification are many. Some of the benefits our PEV drivers have experienced are:

A. Reduced dependency on foreign fuels. Many of our drivers only put gas in their Chevy Volts every three months and do not miss inhaling the fumes.
B. Home electric bills have only increased, on the average, $15 dollars per month.
C. The cars are quiet and the ride is smooth and stable.
D. PEVs only require oil changes typically once in a two year period.
E. The cost of electric stays relatively stable as opposed to gasoline prices changing daily.
F. PEV adoption lowers carbon emission which is harmful to the environment.

The new technology can spur a brighter, greener economy which creates new investment and produces jobs. The benefits referenced are global but the focus of our project is regional. The method we chose to benefit the local public was to install up to 50 public, work, fleet and private EVSEs in the Lansing area and offer incentives for people to purchase electric vehicles. We felt that prospective PEV shoppers would be more inclined to purchase an electric vehicle if there were placed in public locations where they would be able to charge their vehicles while on their daily commute. We wanted the charging stations to be accessible to all who may need a charge. We wanted to eliminate the public perception that the infrastructure to support electric vehicles does not exist. We believe we accomplished that goal. The primary benefit to having all the public charging infrastructure available is PEV driver are able to stay on electric and off gasoline as much as possible.

An indirect benefit of our project that we noticed is initially we only saw PEVs which were part of our project around town. As time passed, we begin to see more and more PEVs which were not part of our program in the Lansing area. We believe much of this is due to our outreach programs which are aimed at educating the public about electric vehicles so they can make informed decision about their next vehicle purchase and remove the stigma with owning a PEV. This education has raised awareness for the upcoming generations, the current generation and has helped with growth and acceptance of PEVs.

Our project allowed us to understand the desire of driving electric and the willingness of people to

adopt the new technology. We realize there are barriers which are going to limit the number of PEVs purchased and EVSEs installed. Our project is also allowing us the opportunity to evaluate the impacts charging stations will have on our distribution system, the many benefits of driving electric and the importance of continuing to provide education regarding Plug-in Electric Vehicles. Let's remember to Plug, Drive, Repeat.

Goals / Objectives

Below is a summary of a comparison of the objectives of our project and the actual accomplishments. We tracked this with each Quarterly Progress Report of our project and findings are displayed below.

1. Subtask 1.1:
   Research & Partner Companies for Electric Vehicle Supply Equipment (EVSE): Determine which EVSE companies are in production or soon to be in production with level 2 (240 volt) charging and furthermore are listed with UL or other nationally accepted laboratories

Actual Accomplishments for Subtask 1.1:

Task Complete

Report 12 **Final** (09/27/13):

We found early on there were approximately 50 companies who started selling EVSEs. Not all the companies had received NLRT Certified, but we only chose EVSEs for our project which had. Many manufacturers discontinued selling EVSEs and others have started. This is an ever changing vendor market.

Report 5 (12/31/11):

We are no longer updating our spreadsheet **EVSECompanies1**. We are referencing the http://www.pluginamerica.org/accessories website and will note if there is anything significant to report.

Report 4 (9/30/11):

Our tracking of this information continues but has slowed down since we have selected the units we are using for our program. Over time several more units will become NLRT certified but we do not anticipate expanding our program past the 6 we are currently using.

We are also referencing the following website for EVSE updates in addition to our spreadsheet.
http://www.pluginamerica.org/accessories

Report 4 (9/30/11): See attachment EVSECompanies1.

Report 3 (6/30/11):

This document is a living document and continues to be updated and expanded as more information becomes available. Several more companies have received their National Laboratory Recognized Testing certification giving us more variety for the EVSEs we can order.

Report 2 (3/31/11):

This document is a living document and continues to be updated and expanded as more information becomes available.

Report 1 (12/31/10):

Developed an excel table that defines the EVSE Manufactures, which have National Laboratory Recognized Testing.

2. Subtask 1.2
   EVSE Purchases: Compile a database of potential EVSE's that apply to this project and purchase at least four different EVSE types to test during this project.

Actual Accomplishments for Subtask 1.2:

Task Complete

Report 12 **Final** (09/27/13):

We finalized our installations with a Tesla charging station at the Eastwood Town Center parking ramp which is located off of I-127 here in Lansing. We have about 13 Tesla owners who use this route to travel from the southern portion of Michigan to the northern portion. We have installed a total of 9 different vendor charging stations.

1. Tesla – commercial
2. Eaton – residential/commercial
3. Clipper Creek – residential/commercial
4. Blink/Ecotality – residential/commercial
5. Voltec/GM – residential
6. Leviton – residential/commercial
7. Coulomb - commercial
8. GE Wattstation – commercial
9. Schneider/Square D – residential/commercial

Report 11 (06/30/13):

The GE Wattstations have been installed at the BWL's new Cogeneration plant. These charging stations are the first to have the retractable cord, which our program believes will be a huge benefit. Currently, many of the charging stations end up with the cord not being put back as it belongs and it is left on the ground. We have no intentions of purchasing another type of EVSE.

Report 10 (03/31/13):

The PEP charger has been installed, but isn't operational yet. The ramp is geared to open shortly. We have ordered the GE Wattstation to be installed at the BWL's new Cogeneration plant.

Report 9 (12/31/12):

We purchased a PEP station to be installed in a parking ramp. This is our first dual charging station to be installed. Hasn't been installed yet. Also planning on purchasing four GE Wattstations to be installed spring 2013.

Report 8 (09/30/12):

Unsure whether we will try any other manufacturers for charging stations. Marking this task Complete. If we do order any additional manufacturers we will update this status.

Report 7 (06/30/12):

We opted to order several Eaton pedestal units. They met the needs of our installs (prompt delivery, RFID optional, pedestal mount, reasonable cost). We are still considering the GE Watts for one location, but at this time the lead time is long and the higher cost is questionable. We like the fact the GE has a retractable cord, all other units in our program have cords you have to wrap up at the unit (cord management issues).

Report 6 (03/31/12):

We have ordered 4 wall-mount Coulomb commercial units. We are considering purchasing the following commercial units for install: a Coulomb commercial pedestal unit, PEP station (dual charging), an Eaton Pedestal, and a GE Watts. Purchase of these units depends on availability and capability for the determined locations.

Report 5 (12/31/11):

We are still at the 6 vendors for EVSEs. We may try a Coulomb commercial unit and a PEP for dual charging locations.

Our new orders since last quarter have included:

10. Clipper Creek – residential
11. Eaton – residential

Report 4 (9/30/11):

We have ordered one more Vendor's EVSE, to add to our program since the last quarter. The new product is the Schneider/Square D residential unit. This purchase gives us a total of 6 different EVSE types. To recap here are the vendors we are using:

12. Clipper Creek – commercial
13. Blink/Ecotality – residential/commercial
14. Voltec/GM – residential
15. Leviton – residential/commercial
16. Eaton – commercial
17. Schneider/Square D – residential

Installation for the Blink/Ecotality commercial units have not been completed as of 09/30/11 but are in the process.

Report 3 (06/30/11):

We have ordered one more Vendor's EVSE, to add to our program, it has yet to be installed. The new product is the Blink which is manufactured by Ecotality. This purchase gives us a total of five different EVSE types. See Qtr 2 below for the four other EVSE Vendors.

Report 2 (3/31/11):

Our program has already purchased four different EVSE units and have installed three at various locations.

1. Clipper Creek – installed at MPSC Office Building, Lansing MI
2. Eaton – installed at a resident's home, Lansing MI
3. Leviton – installed at BWL Office Building and at a resident's home, Lansing and East Lansing MI
4. Voltec – by GM, has not been installed yet.

3. Subtask 1.3

Evaluation of EVSE: Evaluate ease of installation and use, durability, user friendliness and communication software interfacing.

Actual Accomplishments for Subtask 1.3:

Task Complete

Report 12 **Final** (09/27/13):

We have evaluated nine different EVSEs; a combination of residential, commercial, wall mount, pedestal mount, pole mount, smart and dumb units. Our project has demonstrated that many of the EVSE manufacturers may have been ready to sell their EVSEs, but they had not troubleshot the software. At this time we recommend most customers (residential and commercial) who are interested in installing a charging station themselves go with a simple "plug and play". Our Leviton (Charge Point software) has worked the best and has had the least amount of issues for the customers. The Eaton units function properly for the customers to charge their vehicles, but we have had issues with being able to gather data. Eaton is working with us to change the units out; the new unit will have the Charge Point software. Unfortunately, Blink has been extremely problematic. We were done trying to get them to fix our issues with the units and decided if we have further problems with our units we will unhook the intelligence from the units and simply make the charging stations "plug and play". However, we just received email notification that Blink has been bought out by CarCharging and they are working on fixing the Blink units already installed; we will contact CarCharging to verify our EVSEs are in their

system.

Report 11 (06/30/13):

We are still having the same difficulties as the past quarter. Blink has been working with us closely to get the issues resolved. Eaton units aren't allowing us to gather the data and we are now working with Eaton to get this resolved. Eaton is supposed to be changing their network to be the same as ChargePoint. We hope once this is completed we will have better luck gathering data.

Report 10 (03/31/13):

We are having software communication issues with our commercial units. All residential units, minus 1, have a 2nd meter installed to monitor the data and we are having no issues collecting the data for those. We have continually had problems with our Blink units and are not able to monitor data on several of the units. This has definitely consumed a far greater amount of our time than we anticipated. We are having a few issues being able to collect data from our Eaton units which are installed. Our Leviton / Coulomb units, which use the Charge Point Network have worked well. Our understanding is Eaton is now switching their network to the Charge Point Network.

Report 9 (12/31/12):

Only two charging station has been installed this past quarter. There were no issues with these installations.

The EVSEs we have installed from Blink have been nothing but trouble from the perspective of reliability of the units and responsiveness from service technicians. It is becoming extremely frustrating to both our customers and our project team. One of our participant's work location was out of commission for 4 months and another participant's work location for 3 months. Another customer who has had repetitive difficulty with their Blink stations, they have 4, has found a means to disconnect the intelligence and simply make the EVSE a "plug and play." This, unfortunately, doesn't allow us to monitor data, but the same is true when the EVSE isn't working. The benefit of disconnecting the software is customer satisfaction and reducing barriers to non-PEV owners considering purchasing an EVSE. Below are a couple of articles found which are strong representations of what other PEV owners have dealt with regarding the Blink EVSEs and what they are doing to coupe.

Report 9 (12/31/12): http://www.mynissanleaf.com/viewtopic.php?f=4&t=3279; http://www.plugincars.com/why-ev-charging-companies-need-notification-systems-126133.html

Report 8 (09/30/12):

Had a great quarter for our commercial EVSEs. We installed a couple in business parking lots and a few in parking garages. The installations were all standard, with no issues. Still working to get more businesses to agree to having EVSEs on their property.

Still having issues with the RFID access and operation of the Blink stations. Working with Blink's customer service to get all the units operational.

We now have 38 EVSEs installed in our program. 16 residential, 6 work, 8 Public, & 8 Fleet

Report 7 (06/30/12):

Haven't gained much more experience in the last quarter regarding installations of commercial units. Still finding the most difficult part of the commercial installation is getting the business to say "yes".

The friendliness of most units has not been an issue. The Blink units / Ecotality units are what we would call not user friendly for the commercial units. We found we are unable to disable the RFID cards. In addition to not being to disable, user must register their RFID cards with a personal credit card for use, also when using a Blink unit you must enter your zip code after you swipe your RFID card. It is just too many steps for customers.

Report 6 (03/31/12):

Residential installs are now complete. Commercial installs are approximately 40% complete. Installations have given little to no difficulty and seem to be standard type electrical work for the electricians. Inspectors have varied with their ideas of grounding and this has held up the commissioning of the EVSE in a couple situations. Issues have always been resolved.

Most EVSEs are functioning well. We have had several issues with our Blink charging stations, both residential and commercial. We don't plan to order any more Blink and are discussing the possibility of swapping out the ones we currently have purchased if Ecotality doesn't fix the problems soon.

Report 5 (12/31/11):

Residential Units

We have chosen to install six different versions of residential EVSE units for our customers. The initial plan was to evaluate only four manufacturers but the number of units grew based on manufacturer availability. Toward the end of our roll-out of residential EVSEs, we decided to move away from installing smart units, and moved towards installing basic units instead. The reason for this was due to our installation of BWL owned smart meters ahead of the EVSE to capture billing data. They also feature a basic, compact design, and were easy to install. While the standard units do not offer much in functionality, they charged PEVs with the least amount of issues. We also learned that the smart, networked units have unresolved issues that we still deal with today.

Standard Units:
Clipper Creek
Eaton
Schneider
Voltec (GM)

Smart Units:
Leviton
Blink

Commercial/Public Units

We chose three different manufacturers for commercial and public installations. Both units have the capability of connecting back to a network for charge data collection and storage. We are finding that functionality with these units is troublesome. This could be due to these products being rushed to market without time for proper testing. For instance, our first delivery of Blink units was shipped with memory cards that were obsolete almost immediately. The process for having these cards changed has been quite an ordeal. There has been a myriad of issues with Blink units. To date there are over 20 technical service bulletins to fix various problems. While the units are manufactured here in Michigan, they so not have technicians available to fix critical issues like display screens going blank while still under warranty.

The process for collecting data is cumbersome. A standard format for charge data does not exist so it is left up to the networking company to store data as they see fit. It would be a great benefit for this information to come in standard format as it would make analysis much easier.

Smart Units:
Leviton
Blink
Eaton

Report 4 (9/30/11):

We are discovering that the EVSE's which come with Smart Metering are having difficulty working with delayed charging. We found this to be true early on with the Eaton unit and then later with the Blink. So far the Leviton is the only Smart Meter we have found which has no problems with delayed charging. Manufacturers are prompt in addressing issues with their units. We will be conducting discussion groups with the electrical contractors regarding installations.

Report 3 (6/30/11):

As mentioned last quarter the Eaton EVSE unit was having software issue which were addressed and thought to have been resolved. This was not the case. The Eaton unit is still not working properly with delayed charging. A Blink unit has been ordered and will be replacing the Eaton unit on 7/19/2011.

Report 2 (3/31/11):

Our program currently has gained some experience installing a few EVSEs. We are just beginning to experience the user friendliness and communication software interfacing. We will begin to develop Lesson Learned from these different experiences. The installed Eaton model was discovered to have communication problems with the delayed charge setting for the Volt. This issue was addressed between the Eaton Corp and General Motors. The issue has since been resolved, but it has brought up an issue that both the Auto and EVSE manufacturers now know need to be addressed.

4. Subtask 2.2

Purchase of Electric Vehicles: Purchase upwards of 20 vehicles with community partners contributions and BWL Federal funding.

Actual Accomplishments for Subtask 2.2:

Task Complete

Report 12 (09/27/13):

We closed our project with a total of 23 PEVS. 22 Chevy Volts and 1 Ford Transit connect. The vehicles in our program will continue to be used for the intended purpose of the project.

Report 9 (12/31/12): We have no plans of purchasing more vehicles.

Report 8 (09/30/12):

Vehicle status has not changed since the last report.

Report 7 (06/30/12):

We currently have 23 PEVs in our program 22 Volts (16 residential, 6 fleet/business) and 1 all Electric Transit Connect.

Report 6 (03/31/12);

We have 16 residential participants, 4 fleet Volts. We have 2 more fleet Volts expected to be picked up within the month of April; these are both community partner Volts.

We added a new electric vehicle to our program this past quarter. We have added a Ford/Azure Transit Connect to the BWL fleet. This is an all-electric service van which is expected to get about 90 miles per charge. This vehicle is being assigned to our metering department. We are excited to see the range from this vehicle.

Report 5 (12/31/11):

We are at 16 residential participants with Volts and 3 fleet Volts. We have two more fleet Volts expected to arrive in our program this quarter and may possibly have orders for two Transit Connect fleet vans.

Fleet vehicles are still limited through GM and we are discovering that municipalities are less committed to buy since they do not receive the Federal Tax rebate of $7,500.

12 Chevy Volts have been purchased,
7 Chevy Volts have been leased as part of our program.

Report 4 (9/30/11):

This has been an extremely busy quarter for receiving vehicles. We have 11 residential participants with their Volts. We still only have one fleet vehicle, but at least two more are expected next quarter. Fleet vehicles are not readily available for purchase; General Motor's main focus seems to be residential. This is the biggest barrier in our project so far.

7 Chevy Volts have been purchased,
4 Chevy Volts have been leased as part of our program.

Report 3 (6/30/11):

There have been no additional vehicles purchased / leased during Qtr 3 due to the limited number of Volts released. We did just receive word that approximately 7 more of our residential and 1 of our commercial participants will be getting the Volts in Qtr 4. one participant is scheduled to pick her Volt up July 9, 2011.

Report 2 (3/31/11):

As of March of 2011:

2 Chevy Volts have been purchased,
3 Chevy Volts have been leased as part of our program.

These purchases /leases have been made with a combination of partner contributions and federal funding.

5. Subtask 3.1

Research Model Options for EVSE: Research different model options for EVSE infrastructure and installation to create a smooth transition to PEVs in both the home and work place for our customers

Actual Accomplishments for Subtask 3.1:

Task Complete

Report 12 **Final** (09/27/13):

This past quarter we have finished our EVSE installations. We worked diligently to install an EVSE in the main downtown street, but we were not granted permission; there was resistance due to the perceived loss in parking revenue. Our installations this past quarter have been fairly standard. We did install a Tesla charging station in a ramp which did require a 100 amp circuit. We also completed an installation at the local mall. We installed charging station at a variety of locations: homes, a condo, parking ramps, business garages, parking lots, and attached to a solar carport.

Report 12 (09/27/13): See Attachments: EVSE Location Map 092713.pdf, Site Forms #48 through #56.pdf.

Report 11 (06/30/13):

This past quarter was very exciting due to the installation of our Solar Powered Electric-Vehicle Dual Carport Charging Station. We were the first publically owned utility to install a set-up such as this, available for the public. This was a great day with the City of Lansing 's Mayor and the General Manager of the BWL present to launch this new renewable energy source, which allows

zero emission driving and reduces the impact on the grid.

We are working on one of our final installations on a main downtown street. This is creating evaluations of circuits to tie the service into, billing options, and possible revenue loses. We will have more to report in our final report.

Report 11 (06/30/13): See Attachments: EVSE Location Map 063013.pdf, Site Forms #45 through #47.pdf.

Report 10 (03/31/13):
Solar powered electric vehicle charging carport will be complete middle of April. No other new installation models have been encountered at this time.

Report 10 (03/31/13): See Attachments: EVSE Location Map.pdf, Site Forms #41 through #44.

Report 9 (12/31/12):
Still working on the solar installations, hopefully the purchase and installation will take place next quarter.

Report 9 (09/30/12): See Attachments: EVSE Location Map.pdf, Site Forms #39 through #40.

Report 8 (09/30/12):
No addition model options since the last report. Hoping to have a solar carport charging station in the near future. Determining the best location for visibility, accessibility, and sun benefit.

See attachments for the following EVSE install locations,

Report 8 (09/30/12): See Attachments: EVSE Location Map.pdf, Site Forms #31 through #38.

Report 7 (06/30/12):
The pole mounted EVSE which was mentioned in the last report was installed. No issue occurred. See Site Form 29 for further details.

Report 7 (06/30/12): See Attachments: EVSE Location Map.pdf, Site Forms #26 through #30.

Report 6 (03/31/12):
We encountered one new infrastructure model in the past quarter. One of our community partners is installing a pole mounted EVSE. We had a delay in ordering the pole mounted EVSE. We only found one vendor at this time which provides a pole mount and the cost was extreme compared to the wall mount or pedestal. After discussion with the Project Partner it has been determined a wall mount will be ordered and the project partner is creating a way to mount it to the pole. This unit has not been installed as of the end of 03/31/12.

We have completed our residential installations.

Report 6 (03/31/12): See Attachments: EVSE Location Map.pdf, Site Forms #21 through #25.

Report 5 (12/31/11):
We have installed pedestal and wall mount EVSE so far in our program. We are in the process of ordering a pole mount which will be installed this quarter at a community partner location.

Ease of installation varies at each location.

Report 5 (12/31/11): See Attachments: EVSE Location Map .pdf, Site Forms #11 through #20.

Report 4 (9/30/11):

We have installed 10 EVSEs so far, 6 residential and 4 at work locations.

We have installed a commercial charging station on the campus of Michigan State University in a parking ramp for one of our community partners.

We have 4 more installations in progress at the end of 09/30/11. 1 at a work location for a residential participant, 2 at a community partner location and 1 at a condominium for a residential participant which is more representative of a commercial installation. These four will be completed early October 2011.

We also have 4 residential installations expected to take place within the next month.

Report 4 (9/30/11): See Attachments: EVSE Location Map 093011.pdf, Site Forms #7 through #10.
Note: Site Map #10 is missing photos, they were accidentally deleted. Picture will be included with next quarters report.

Report 3 (6/30/11):
We have installed 6 EVSEs so far, 3 residential and 3 at work locations.

These installations have included several variables which include but are not limited to: different EVSE units, wall mount / pedestal mount. Indoors / outdoors, separate metering capability, and restoration work.

Included with this progress report is an area map depicting the existing sites where EVSEs have been installed and future site where we expect units as our program progresses.

Also included are "Site Forms" which give specific details for the units installed including photos.

Report 3 (6/30/11): See Attachments: EVSE Location Map 071211.pdf, Site Forms #1 through #6.

Report 2 (3/31/11):
Task Complete for residential. Will be an on-going process for work locations as each site location may have different requirements.

Report 1 (12/31/10):
In March 2010 our BWL Project Team designed 5 different home installation models to propose to local electrical inspectors.

Work place models will be evaluated at each location.

6. Subtask 3.2

Model Approval: Work with the local electrical inspectors in the BWL's distribution territory to determine which models will be acceptable, meet National Electric Codes and best serve our customers

Actual Accomplishments for Subtask 3.2:

Task Complete

Report 1 (12/31/10):

Our BWL project team met with local electrical inspectors in March 2010 and agreed upon 4 residential home installation models which will be used for home installation of EVSEs.

A final Home Installation document was issued in October 2010.
See attachment.

Also through the Michigan Public Service Commission PEV Taskforce committee Michigan was able to get a new building code passed which will allow a separate disconnect specifically for the EVSE. This new code is
E3601.6.4 which states "Electric vehicle charging system service disconnect. A separate disconnect for electric vehicle charging systems shall be permitted. The disconnect shall be located immediately adjacent to the outdoor meter cabinet. A permanent plaque or directory shall be installed at each service disconnect location identifying the other services, feeders, and branch circuits supplying a building or structure and area served by each service, feeder, and branch circuit. The disconnect shall not be required to be grouped with the service disconnects for the structure." and will go into effect March 9, 2011.

7. Subtask 4.1
Community Involvement: Acquire commitments from local entities, served by the BWL, to purchase electric vehicles and install necessary infrastructure

Actual Accomplishments for Subtask 4.1:

Task Complete

Report 9 (12/31/12):

Signed Agreements we signed by two more community partners. One installation is complete; the other will be completed next quarter.

Report 8 (09/30/12):

We have three potential community partners lined up to sign the program Agreements. These are business interested in having charging stations installed at their place of business. We hope to have Agreements signed and installations complete next quarter.

Report 7 (06/30/12):

Due to funds still available in our program we are considering approaching a couple commercial businesses to our program as community partners. We currently have governmental / township entities and would like to gain the experience from a commercial business.

Report 6 (03/31/12):

We added one community partner who is interested in purchasing a Volt and installing an EVSE at their business location, working to finalize contracts. Contracts are expected to be signed and Volt picked up by the middle of April.

We have received commitments from several other business/public locations and will be installing approximately 15 charging stations in the next quarter.

Report 5 (12/31/11):

Initially 5 local entities committed to the program.

One local entity has purchased 2 Volts and installed 2 EVSEs and has picked up 2 more EVSEs to install. Another local entity has ordered a Volt and will be installing charging stations shortly. Two local entities have opted out of purchasing Volts but have agreed to having EVSEs on their property. One local entity is undecided.

Commitments from businesses has been difficult so far. They are more apprehensive about having charging stations installed, the image of catering to a single employee, and cost recovery to the energy used.

We have 18 business installs we would like to have commitments from the companies this quarter and have started or completed several of the installations. Winter is a delay in the installs due to the frozen ground.

Report 4 (9/30/11):

Fleet orders seem to have been delayed or very limited through General Motors. All of our existing Community Partners have to purchase through fleet and have been unable to acquire vehicles.

One of our community partners is in the process of installing 2 charging stations at the township offices.

One of our community partners just completed installation of 1 charging station on Michigan State University campus.

The BWL second Volt has yet to arrive but we are still anticipating 4th qtr of the calendar year 2011.

Report 3 (6/30/11):

The BWL project team is still working with the community partners to get their Volt orders placed.

1 partner has ordered 1 Volt and expects delivery in Aug or Sept of 2011. They are expecting their second Volt in the early part of 2012.

BWL plans to order their next fleet Volt by the end of August. This Volt won't be delivered until early 2012.

We had 4 of our residential participants drop out and we have added 2 from our waiting list. We are holding back on putting anymore in at this time because we have discovered our estimate for installation to be low and we need to make sure we stay on budget.

Report 2 (3/31/11):

The BWL project team has meet with 3 of the 5 community entities to discuss project plans. As of this time none of the community partners have purchased their PEVs but still have plans to do so.

The BWL has purchased one fleet PEV.

The applications of the 28 residents have been reviewed. Letters of acceptance into the program were issued by January 15. 16 total residential participants have been accepted. Several of the initial 28 are on a waiting list if some of the accepted 16 decide to decline. 4 of the 16 have received their vehicles and 4 more have placed their orders. Installation of charging infrastructure is still in the works.

Report 1 (12/31/10):

The BWL project team has received commitment letters from 5 community entities.

As of December 23, 2010 the BWL has received applications from 28 residents to purchase electric vehicles and install the necessary infrastructure.

The applications are being reviewed in January 2011 and acceptance into the program will be granted by January 15, 2011.

8. Subtask 5.1

Outreach in Community: Provide education to electrical contractors, local inspectors, vehicle dealerships and consumers

Actual Accomplishments for Subtask 5.1:

Report 12 **Final** (09/27/13):

Education has been a large part of our project through forums, public events, give-aways and workshops. This last quarter had a launch of an educational display at the local science museum. This is something we have been very excited about. We partnered with the Impression 5 Science Museum here in Lansing to build and exhibit a plug-in electric vehicle display for kids of all ages. This display can be transported to different sites for different events. The display has an interactive touch screen which answers questions about PEVs, charging stations, locations of charging stations in and around Lansing, and many fun facts. The display lets the kids plug the car into a "charger" and watch the battery fill up, then they can push the start button and watch the wheels spin and see the battery deplete. The kids have been enthralled to interact and learn. ***Follow the link for a sample of the interactive information:***
http://impression5.org/Portals/0/files/pevdisplay/index.html

Report 12 Final *(09/27/13): See attachment Impression 5 Display Complete.pdf.*

Report 11 (06/30/13):

Our program continues to provide education to the public every opportunity we can. This last quarter has been exceptionally busy with events.

- We have begun to paint the PEV stencil in the PEV parking spaces. We are hoping the will discourage the non-PEV owners from parking in the spaces.

- We had the solar carport dual charging station launch in mid-April; to coincide with Earth Day. This event was open to the public to attend. It promoted the BWL's PEV Community Project and partnership with the City of Lansing's "Live Green" initiative.

- May 14-16, 2013 - We had the Great Lakes Electric Utilities Show (GLEUS). We displayed the Chevy Volt, a residential 2nd meter set-up for TOU charging, poster, a GE Wattstation charging station and had people available to speak about the vehicles, charging stations and driving electric. A great deal of positive response.

- May 4, 2013 - Adopt a River Clean-up with Chevy Volt and Transit Connect on display. We gave out Plug. Drive. Repeat. Water bottles, buttons for the kids, and informational booklets for the adults.

- June 18, 2013 - PEV Team member spoke on a PEV panel at Next Energy regarding Workplace Charging.

- At the open house of our new Cogeneration Plant we had our 2 Chevy Volts present to be used as shuttle cars to drive customers from parking lots to the new building.

- Making progress with our Impression 5 display mentioned last quarter. We hope in the next month to have a prototype to see, touch, and experiment with. This is truly a great creation for educating all ages.

Report 10 (03/31/13):

We are working with a science museum here in Lansing, Impression 5 (http://www.impression5.org/), to build an interactive PEV display for individual of all ages to learn about Plug-in Electric Vehicles, emissions, and more. Please see attachment for diagram, the display will have an interactive display which can be updated with new information as it comes out.

Report 10 (03/31/13): *See attachment Impression 5 Display.pdf.*

Report 9 (12/31/12):

Had vehicle wraps added to our 2 Volts and one Transit Connect promoting electric vehicles and our program. These wraps have raised awareness (people observing more as you drive around)

and spurred further conversation when out in the public.

Continuing to provide electric vehicle training to more employees around the BWL.

Also looking to develop a Facebook page for our program participants to communicate with each other.

Report 9 (12/31/12): *See attachment PEV Wraps.docx.*

Report 8 (09/30/12):

Partnered with the Greater Lansing Clean Cities Coalition and Lansing Community College to host a PEV Road Rally on September 22nd in recognition of National Plug-in Day (September 23rd). We had a total 10 participants and 4 Chevy Volts. Participants were given clues to lead them around town to specific locations (happened to be different charging stations). Participants were given points for completed the route the fastest (without breaking laws), completing all the clues, photos with a PEV, a brochure from a dealership on Volts, least miles used and a picture with a renewable energy source. The event was a lot of fun. This event was hosted along with a car show to help promote PEVs to more of the public.

Follow link for Road Rally information http://michigancleancities.org/archives/1670.

We would also like to note that the BWL had interns working with us this summer. This offered a great opportunity for the younger generation to experience electric vehicles. Two of our interns used the Chevy Volt to work on the BWL's Mid-Michigan Tri County Sustainability Project.

BWL Senior Engineer gave a presentation at Eaton Corporation on our program for electrical contractors on 07/25/12.

Report 8 (09/30/12): *See attachment Intern Chevy Volt Usage.doc.*

Report 7 (06/30/12):

Displayed the Volt and a new charging station installation at an Adopt a River event on April 14th in downtown Lansing. Gave out gift bag give-aways with PEV booklets.

The teams Project Manager spoke at a local Rotary Club meeting regarding our program and plug-in electric vehicles on May 22nd. Gave out gift bag give-aways with PEV booklets.

Moved the date to June 2nd to coincide with the Board of Waters & Light Annual Chili Cook-off. This was a great event. We had approximately 50 people in attendance. We had 16 project participants and their families attend. We had 16 Chevy Volts lined up. We held the event at the same time our company held their Annual Chili Cook-off which brings thousands of people downtown. This was a great opportunity for people to see the cars.

At the forum we had the Project Manager provide a project update and we asked 4 of our participants to speak and share their experiences with the vehicles. At the end we left time for questions and answers and time for our participants to meet. Great event!!

June 12th one of our PEV team members took the Volt to a local car event. He handed out PEV booklets and let interested parties check out the vehicle. He also answered any questions the people had.

June 15th and 16th our two Volts were taken to the Juneteenth event held here in Lansing. A PEV team member stayed with the Volt, handed out PEV booklets and spoke about our program to interested people.

Continuing to provide training sessions to areas around our company interested in learning about PEVs, our program, and/or driving one of our PEVs.

Here is a list of events one of our participants sent to us, showing what activities they have taken part in around the Lansing area.

Feb 13 through Mar 10 - Car displayed at RE Olds Transportation museum for comparison with 1996 EV1 and 1899 Oldsmobile electric cars. Developed comparison of specifications of the 1996 EV1 and the 2012 Volt.
Mar 10 - presented and answered questions for two groups of teachers (20 each) on an innovation tour of the museum - "Necessity is the Mother of Invention" led by Jim Walkinshaw
May 12 - presented and answered questions for one group of teachers (15) on an innovation tour of the museum
May 15 - presented and answered questions for Project Management Institute holding a seminar on the development of the Volt - Lexington Hotel
June 2 - plugged in for display at the charging station at Impression 5 (Be a Tourist in your own Town)

plus many discussions, rides and sample drives to interested individuals.

I also expect to have it at the Car Capitol Car show on July 28 (maybe alongside my 1954 Chevrolet!)

Report 7 (06/30/12): *See attachment Plug-In Electric Vehicle Spring Forum Event.pptx.*

Report 6 (03/31/12):

Our program gave out gift bags at the Home and Garden Show in March. Gift bags included promotional PEV items and an educational booklet talking about PEVs, EVSEs, and our program.

We are in the process of planning our participant forum, tentative date June 1, 2012. Planning to have participants speak about lessons learned, best practices, fun stories. BWL will provide participants with a project update, including number of participants, number of EVSEs installed, data findings and future plans.

Continuing to provide training sessions to areas around our company interested in learning about PEVs, our program, and/or driving one of our PEVs.

Report 6 (03/31/12): *See attachment Gift Bag Give-Away.jpg, PEVBookletforWeb.pdf*.

Report 5 (12/31/11):

We did not have any events in the past quarter. We are planning a couple forums this spring (March or April) for the project participants and possibly the electric contractors and inspectors.

Two of our PEV team members did attend the 2011 BPI conference in Dearborn, MI.

Report 4 (9/30/11):

We continue to take part in events in the area to educate the community regarding electric vehicles and their infrastructure. We have also found that several of our residential participants have been very active as well.

We have conducted 3 BWL Program and Volt Informational Training session to IT (Information Technology), Energy and Eco-Strategies, and General Accounting at the BWL.

July 2011 – Hosted a Built by Michigan campaign which is an event sponsored by Senator Debbie Stabenow and former Congressman Mark Schauer to promote the initiatives of Michigan adopting the new technology of electric vehicles and building more businesses and jobs to support vehicles. We had two of our program participants present at this event.

August 2011 – We had our Volt in a local parade ; helping to promote plug-in electric vehicles.

September 2011 – Two of our participants were present at a "ribbon cutting" ceremony in Dewitt Township for a new public charging station the city installed.

September 2011– We hosted a Town Hall meeting which was sponsored again by Built by Michigan. General Motors, Clean Water Coalition, Greater Lansing Clean Cities, BWL, and a Volt owner (one of our participants) spoke on panel regarding plug-in electric vehicles and this new technology. We had 7 of our residential participants present at this event. Each of our participants brought their Volts and let people ride in them for a ride-and-drive event along with several members of the community.

Report 3 (06/30/11): We have taken part in several events around the community to inform and educate the public about plug-in electric vehicles and their associated infrastructure.

April, 2011 (Qtr 2) – Home & Garden Show we had poster displays, a commercial EVSE (PEP), program pamphlets, and spoke with the public.

May 2011 – Green Transportation Event at Meridian Mall, took the Volt, a home EVSE (Leviton), and our program pamphlets and spoke with the public.

May 14, 2011 – Adopt a River Event – Had the Volt on display, a commercial EVSE (Schneider), and our program pamphlets and spoke with the public.

June 10, 2011 – Juneteenth Event - Had the Volt on display, our program pamphlets and spoke with the public.

On June 3, 2011 - Have also provided a BWL Program and Volt Informational Training session to the Meter Readers at the BWL.

Report 2 (3/31/11):

- The BWL project team is working to approve and accept qualified local electrical contractors (EC).
- Interested ECs have completed a pre-qualification application and the accepted EC were issued a Request for Proposal (RFP).
- The RFPs have been received back and are currently in the process of being review.
- Several ECs will be selected to keep their dollar amount to less than $100,000 each.
- The ECs interested in submitting a RFP were invited to a pre-bid meeting where members of our project team educated them about current EVSEs models available, installation models, the new residential code in Michigan, etc.

- Residents who are driving their PEVs for the program have received program brochures to be distributed to individuals who inquire about our program. *See attachment Electric VehicleGeneralBrochure.*

9. Subtask 6.1

Data Collection & Analysis on Energy Use, Time of Use and Pattern Usage: Assess the impacts electric vehicles could potentially have on the electric grid in the future as well as proper design future rates for EVSE usage such as time-of-day and hourly pricing

Actual Accomplishments for Subtask 6.1:

Task Complete

Report 12 Final (09/27/13):

We have collected charging data for nearly two years for some EVSEs. Unfortunately, with all the network issues and charging station operation issues we do not have a solid set of data for most of our units. We currently haven't experienced enough of an influx of EVSE installations to have a direct impact on our distribution system. The installations have been spread-out enough that we haven't required any updates to transformers or circuits. We are receiving more requests from customers who wish to sign-up for our TOU rate. If this continues we will most likely need to develop a program which assigns customers a charging time period within our TOU period. As previously mentioned we are seeing most all of our TOU customers set their vehicles to start charging at exactly 11pm (the beginning of our TOU period). Again because of the wide-spread installations this is not an issue. However, if several were on a single circuit of the same transformer without staggered start times, upgrades would be required.

Our data shows residential customers who are on the TOU rate are charging an average for the year of 79% off-peak compared to the one customer who isn't on the TOU rate who charges 6% off-peak.

Due to some units not allowing us to monitor data, we used an average from the units which we were able to monitor to estimate totals. Below are our findings.

Since the inception of our project we show in our distribution system 60,929kWh are from residential, 15.551kWh are from fleet, 6,424kWh are from work and 5,194kWh are from public. This is consistent with our original prediction in electric vehicle adoption that most charging would take place at home, fleet would follow, then work, and last would be public. We are finding that the more public charging station which are installed and the more PEV driver who are not part of our program that the work and public charging numbers are getting more closely matched.

Report 12 (09/27/13): See attachment Charging Data_DOE 092713.xlsx. See attachment Solar Carport and EVSE data Sept 18 2013.doc.

Report 11 (06/30/13):

Similar findings as last quarter. Still have several units which aren't connecting to the network, but we are seeing a pattern from the units which are. Our data shows residential customers who are on the TOU rate are charging an average for the year of 79% off-peak compared to the one customer who isn't on the TOU rate who charges 7% off-peak.

Due to some units not allowing us to monitor data, we used an average from the units which we were able to monitor to estimate totals. Below are our findings.

We show in our distribution system 9,244kWh are from residential, 2,711 kWh are from fleet, 1,635 kWh are from work and 1,465 kWh are from public this past quarter. This is showing what was predicted early on in electric vehicle adoption that most charging would take place at home, fleet would follow, then work, and last would be public.

Report 11 *(06/30/13): See attachment Charging Data_DOE 063013.xlsx.*

Report 10 (03/31/13):

We have collected another quarter worth of data and are seeing nearly the same findings as we did last quarter. Still have several units which aren't connecting to the network, but we are seeing a pattern from the units which are. Our data shows residential customers who are on the TOU rate are charging an average for the year of 80% off-peak compared to the one customer who isn't on the TOU rate who charges 8% off-peak.

Due to some units not allowing us to monitor data, we used an average from the units which we were able to monitor to estimate totals. Below are our findings.

We show in our distribution system 10,144 kWh are from residential, 2,781 kWh are from fleet, 1,273 kWh are from work and 1,121 kWh are from public this past quarter. This is showing what was predicted early on in electric vehicle adoption that most charging would take place at home, fleet would follow, work next, and last would be public. Work and public are very close; there is a 1% difference. This may be because we have encouraged our public and business locations to let anyone use their chargers for the duration of the program.

Report 10 *(03/31/13): See attachment Charging Data_DOE 03-31-13.xls.*

Report 9 (12/31/12):

Still collecting good data on our EVSEs. Have had a couple hiccups with getting a couple units registered and unfortunately didn't catch this until reviewing the data. The TOU rate is definitely a benefit. Our data shows that customers who are on the TOU charge 82% of their time off-peak compared to the one customer who isn't on the TOU who charges 9% off-peak.

We show in our distribution system 10,755 kWh are from residential, 1,609 kWh are from fleet, 346 kWh are from work and 512 kWh are from public this past quarter.

Report 9 *(12/31/12): See attachment Charging Data_DOE 12-31-12.xls.*

Report 8 (09/30/12):

We are beginning to obtain good data. Our numbers definitely display that offering a time of use (TOU) rate does promote off-peak charging. We have 17 residential customers who are on our TOU rate and 1 who is not. Our data shows that customers who are on the TOU charge 83% of their time off-peak compared to the one customer who isn't on the TOU who charges 9% off-peak.

We show in our distribution system an average of 2874 kWh are from residential, 819 kWh are from fleet , 245 kWh are from work and 51 kWh are from public.

Report 8 *(09/30/12): See attachment Charging Data_DOE 09-30-12.xls.*

Report 7 (06/30/12):

We have begun to evaluate our data further. We have seen that by offering a discounted charging rate during off-peak times we can modify peoples charging behavior. Early in the adoption the time of day people charge may not be a big deal, but as more electric vehicles are purchased we will see strains on the distribution system at the after work hours. Getting people to charge off peak is critical.

We noticed that our off-peak begins at 11pm and we are having a peak in electricity at 11pm. At this time most have selected to have their vehicles begin charging at exactly 11pm. At this time this isn't an issue, but as more vehicles are on the same circuits we may need to address this.

We calculated on average our participants are using 140 kWh off-peak compared to 38 kWh on-peak.
Participants on average are spending approximately $15 per month on the electricity.

Residential Electric Usage

Total Electricity used since data collection began = **15,966 kwh**

Other
1. Gallons of gas saved = **2,298 gal**
2. Dollars saved based on use of electricity instead of gas = **$7,725.29**
3. Barrels of crude oil saved = **55 brls**
2. Green House gas (CO_2) prevention = **13,093 lbs**

Commercial Charging Station Data

Total Electricity used since data collection began = **5,312 kWh**

Report 7 *(06/30/12): See attachment Charging Data_DOE 06-30-12.xls. See attachment Rate22-MV90 data.pdf.*

Report 6 (03/31/12):

We have more data compiled to study the charging habits of our residential participants. We have begun to analyze the charging behavior and to determine if offering a discounted TOU rate has encouraged participants to charge off-peak. For preliminary review it looks to be the case. We will have further, more detailed findings in the next quarterly report. In the by next report to have a better understanding of what the impacts the PEV charging may have on the electric grid.

See the attached charge data for kWh measured for each participant. There is a great deal of variation; some of this is due to distance driven each day per participant, problems with some of the EVSEs, vehicles in for service, etc.

In the next reports this data will be further refined.

Our IT department has resolved the billing system for Rate 22.

Report 6 *(03/31/12): See attachment Charging Data_DOE 03-31-12.xls. See attachment Rate22-MV90 data.pdf.*

Report 5 (12/31/11):

We have implemented an Electric Vehicle Time-of-Use Rate. Rate 22. This rate offers Plug-in Electric Vehicle drivers a discounted rate for charging off-peak; between the hours of 11pm and 7 am. All of our participants have opted for the Rate 22. We have found our billing system is having difficulties programming for this. Hopefully this will be resolved shortly.

Report 5 *(12/31/11): See attachment Charging Data_DOE 12-31-11.xls. See attachment Rate 22.*

Report 4 (9/30/11):

Still a work in progress. More data is available since last quarter. We are tracking the circuits throughout the system that each of these charging stations will be connected to so we can determine if there may be a need for changing out transformers.

Site #1 – 6545 Mercantile Way had a flood in the basement which has put the charging station out of commission for the time being. Tenants have been relocated to another building and a determination is being made whether they would come back to this location. The charging station may need to be relocated.

Report 4 (9/30/11)*: See attachment Charging Data.xls.*

Report 3 (6/30/11):

We have assembled two spreadsheets to track charging data. One tracks the EVSE data and the other tracks the vehicle data from OnStar.

We anticipate the spreadsheet to expand with either additional data we determine should be collected, but this will happen as we have more data available to analyze. This is still a work in progress.

The numbering on the EVSE spreadsheet “EVSE Number” correlates to the Site Form numbers.

Report *3(6/30/11): See attachment Charging Data.xls.*

Report 2 (3/31/11):

No data collection has been gathered as of this time. Still in the process of working out how this will be obtained, plus very little data available yet.

Data will be collected from Onstar, Smart-meters in the EVSE units, and/or sub-meters.

James from Idaho National Labs says we may be able to link our participants to his data collection if necessary to obtain data.

Report 1 (12/31/10):

No data collection has been gathered as of this time.
We have developed a TOU rate which was proposed to the Board of Commissioners in Nov 2010. This will go into effect March 2011.

Per kickoff meeting with DOE on 10/27/10 we were instructed to contact James Francfort from Idaho National Labs about PEV data collection. We were able to get in touch with James and found out INL is tasked with collecting data for 5700 Leafs AND 2700 Volts. They are getting data from Coulomb, the Blink Charger (I think), GM and onboard data loggers. James mentioned that it was really tough to get the data from GM. INL had to demonstrate a secure connection that was based on their history of collecting sensitive data since 1994. The BWL will check with our GM representative, Kristin Zimmerman to see if she will come through on the data but if not, James did say that he would consider asking GM to add our 25 Volts to their data stream.

10. Subtask 6.2

Data Collection & Analysis on Vehicles: Work with our community partners regarding their experiences with the vehicles as well as the BWL's experiences through surveys and user groups

Actual Accomplishments for Subtask 6.2:

Task Complete

Report 12 **Final** (09/27/13):

The feedback from our customers has still been extremely positive over the duration of our project. We have had a couple customers who have had some battery issues with their Volts. One customer had their vehicle stall out twice (leaving them stranded) when the car tried to switch from battery to gasoline. This customer was nearing the end of their 3 year lease, so they traded the car back in. A couple of the other customers have had battery issues that are described in the attachment referenced below. For the remaining of the PEV drivers the response has been nothing but positive. They love their PEVs, they are ambassadors for driving electric and some are looking to purchase another PEV.

Report 12 Final (0927/13): ***See attachment PEV – BWL Participant Feedback Survey***

Report 11 (06/30/13):

On June 26, 2013, we received another email from a customer. He stated, "we're averaging better than 500mpg since filing up in early April ;-)". A very happy customer!

On June 4, 2013, we received an email from a Nissan Leaf driver. He stated, "Aside from day to day stuff here are some notable trips we have taken in it so fo far:

- Ann Arbor to Lansing (drive home from the dealer 68miles 1 way on I-96 @ 65MPH)
- Lansing to Whitmore Lake MI (and back in the same day using only L1 charging, avoiding highway, 111 miles round trip)
- Lansing to Bellville MI (and back in the same day using only L1 charging, avoiding highway, 160 miles round trip)

- Lansing to Chesterfiield MI (weekend trip to in-laws 106 miles each way avoiding highway. Stopped in downtown Milford MI each way for lunch to L2 charge for 1 hr, met with friends for dinner and drinks, spent the night at in-laws L1 charging overnight)

Planned trips coming up

- Lansing to Detroit Zoo (This Friday - the zoo has EV charging I need to call and find out if its L1 or L2. I have two routes that avoid highway in mind.) After we visit the zoo we going to meet up with friends in downtown Royal Oak MI, we will park in a parking structure with a L2 charger as we socialize and have dinner)
-
- Lansing to Kalamazoo (attending a 2-day training seminar for work towards the end of this month. The hotel and conference center is only 6-8 blocks from a Consumers Energy building with a L2 station. I will be getting the full milage reimbursement from work!)

In order to go these distances you need to keep your speed down to 60mph or below which pretty much means avoiding highway; This was somewhat difficult at first but if you plan your route right and stop in the right places (with things to do while you are there) it actually brought my wife son and I a little closer.

Before... we just pounded the pavement from one end of the state to the other at 75 MPH, no stopping no nothing. Now, we have an excuse to stop and discover new places. I had never visited Milford MI or driven on M-59.... and I lived in MI my entire life. Come to find out the drive on M-59 is pretty nice and Milford has nice little downtown with a nice big park for our 2 year old to get some of his energy out!

Most of our family is in the Detroit or Ann Arbor area and we were really getting frustrated that it cost us $50 in fuel each time we took our son to see Grandma! He has 3 grandmas to visit! 2500 miles driven so far and the electric bill only +$20/mo or $40 total. The fuel cost to go the same distance in my old car it would have been $432.

Its not an ECO thing for me its a fuel savings thing for me; I sick and tired of how the price of gas can go from 3.80 to 4.15 in 1- day without any explanation. Imagine the outrage people would have if BWL raised its rate 9% in one day because *'BWL is switching from winter electricity to summer electricity*' and then the price never really goes all the way back down to the original price.... then goes up 5% next week because of a wind storm took out some telephone poles,.. then only coming back down 4%. I imagine consumers would find that unacceptable.

Report 10 (03/31/13):

Received a great email from a Volt customer; we have removed their name for privacy. See details below. It has exciting to share the enthusiasm of electric vehicle drivers.

So...got our first bill - $25.69 for a total of 155 KWH - 116 off peak, 39 peak. During that time (3/19-4/08), we drove a total of 545.86 miles, 518.62 of which were on electric power. This equates to $0.049535305 per mile of electric propulsion. Compare that to $3.50/gallon gas - her 2010 Malibu @ 30MPG - $0.116666667 per mile and my 2011 Yukon XL @ 16 MPG - $0.21875 per mile.

The cost of the Volt should go down as we enter warmer weather as we are currently getting 35-40 miles per full charge compared with the 40-50 we got last summer.

I don't have any way to compare this to the cost last year charging on 110V, since I don't have a way to split out the charges last year due to the Volt.

Bottom line: it costs about a nickle to drive the Volt for one mile. Not too shabby.

Report 9 (12/31/12):

Not a lot to add this quarter. Have received a couple report from participants that their mileage has dropped significantly in the cold weather.

Report 8 (09/30/12):

Data / Information we received on our Transit Connect has been as follows.

The Electric Transit Connect was received in early May with less than 200 miles on the odometer.

During the warm spring and summer while running the A/C the range dropped from 70 to 60 or 62 miles per charge. Morning full charge would indicate around 62.

During the Fall Months, not running A/C or heat the range was around 75 to 77. Morning full charge would indicate 75 mile range.

During cold fall weather running while running heater the range dropped to 55 to 57 miles. Morning full charge would indicate 75 mile range.

Final Odometer read is 5121 miles. Final kWh read for charging vehicle 02035. Using 5000 miles as meter start point, 5000 miles divided by 2035 KWH equals approx 2.5 Miles per kWh.

The BWL's metering group feels that if this vehicle had an average usable daily range of 80 miles (using A/C and Heat) that this would make a good alternative to the gas powered blazers we use now.

Report 7 (06/30/12):

We are still focusing on feedback from participants. It has been very positive. They LOVE their Volts. During our Spring Forum we will ask for experiences, lessons learned, etc regarding driving and owning a PEV.

We collected data from the On-Star Diagnostic Reports sent to our participants and have put that information into a spreadsheet for review and analysis. This report summarizes information such as total miles driven, fuel economy, electric miles, gas miles, gallons of fuel saved, estimated CO2 avoided and more. This report only covers a month worth of data. We noticed some who had a high number of gas miles, which didn't match their lifestyle, may have taken their Volt on a trip for that month.

Report 7 *(06/30/12): See attachment Volt OnStar Diagnostic Report 06-30-12.xlsx.*

Report 6 (03/31/12):

We haven't been granted access to collect data from the vehicles and are unsure if it is even available. We are focusing on feedback from our participants. At the time it has all been positive. We have had two participants which had taken their Volt in for "service engine" light messages. Dealerships have been very prompt to diagnose the problems and get them resolved. All participants have been satisfied.

Primary frustration is with the Blink "smart" EVSEs installed, both residentially and commercially. Again working to resolve these issues.

Report 5 (12/31/11):

Still working to be able to collect the charging data from the vehicles.

Feedback from the participants has been very positive regarding ownership and driving their Volts. One participant shared with me how he had to put gas in the car the other day; this was the first

time since owning the car (3 mo). He had to look in the manual to find out how to open the door where you put gas in. Another participant just reached the 10,000 miles on electric and he made a sticker to put on his car.

Report 4 (9/30/11):

The new technology is being embraced at the BWL. Our project team provides training to departments around the BWL interested in driving the Volt so they have an understanding of the differences with driving a PEV and with our program.

Other business community partners have not provided feedback due to not having vehicles. Our residential partners have provided a great deal of feedback via email regarding their experience. It has been very interesting to see how much PEV owners will change their driving habits to maximize their battery life.

Report 4 (09/30/11): See attachment Program Participant Testimonies to Changed Behaviors.com

Report 3 (06/30/11)

We have begun collecting data to analyze the usage and habits of our PEV drivers. We are still in the process of developing a survey to get feedback from the drivers and the due date has been moved to this next quarter.

Report 2 (3/31/11):

In the process of developing the first follow-up survey to gage how vehicle purchases went, EVSE installs, experiences, etc.

Would like to have Survey complete by end of May 2011.

11. Subtask 6.3

Data Collection & Research on Installation Methods: Work with local inspectors and electrical contracts as well as our own staff to assess installation cost, practicality and ease of installation

Actual Accomplishments for Subtask 6.3:

Task Complete

Report 12 **Final** (09/27/13):

We have found that without tax incentives or incentives from the local utilities most consumers find it too costly to purchase and install a level 2 charging station. This is true for both residential and commercial locations.

Report 11 (06/30/13):

We are going to develop a “flyer” to distribute when a customer contacts us regarding installation of a level 2 charging station at their home. It will provide reference to our reimbursement program, procedure for contacting Utility Service’s at the BWL, hiring a licensed electrical contractor, types of EVSEs and more.

Report 10 (03/31/13):

We held an electrical inspectors / contractor’s forum in March to gather feedback and information regarding experience regarding installations and inspections. We had a great turnout, 13 people total and great response. We developed a survey and gained good feedback. Contractors and inspectors didn’t have too many issues with installations; they felt they were fairly standard work. They have received some feedback from customers regarding cost of charging stations and installation. Most customers without the assistance of our program or alike would not purchase and install a level 2 charger.

Report 10 (03/31/13): See Attachment Electrical Contractors & Inspectors Survey.docx.

12. Subtask 6.4

Data Collection on the Effect of Early Education, Training & Marketing: Administer surveys, data gathering from customers, and responsiveness and interest from the community to continue this type of project

Actual Accomplishments for Subtask 6.4:

Task Complete

Report 12 (09/27/13): This section has been overlapped with section 5.1. Please reference that section for the final updates.

Report 8 (09/30/12):

Continue to distribute PEV educational material around the Lansing area. Continue to provide training to BWL employees on the Volt.

Report 7 (06/30/12):

Have survey results from 5 more participants. Again responses are very positive.

Also sent a survey out for feedback on the Spring Forum Event. Responses are very positive.

Report 7 *(06/30/12): See attachment PEV Survey 1 results 10 thru 14.xls, PEV Spring Forum 2012 Survey Responses.doc.*

Report 6 (03/31/12):

Have survey results from 4 more participants. All are positive regarding their experiences. Still need to send out the survey to the remainder of our residential participants.

We also sent out a Demographics Survey. See attachment for results.

Report 6 *(03/31/12): See attachment PEV Survey 1 results 6 thru 9.xls. See attachment Demographic PEV Survey.pdf*

Report 5 (12/31/11):

Sent out the first round of surveys to five participants who have had their charging stations installed at their homes for over a month. We are planning a forum this spring (March or April) for the project participants.

Surveys have just been sent out to 5 more participants.

Report 5 *(12/31/11): See attachment PEV Survey 1 results.xls.*

Report 4 (09/30/11):

The first survey has been developed and reviewed by the team and is in the process of being sent out to residential participants who have their Volts and have their home charging station installed.

Report 4 *(09/30/11): See Attachment, PEV Survey 1.pdf*

Summary of Project Activities *(include entire period of funding, original hypotheses, approaches used, problems encountered and departure from planned methodology, and an assessment of their impact on the project results. Include, if applicable, facts, figures, analyses, and assumptions used during the life of the project to support the conclusions).*

The BWL's Plug-In Hybrid Initiative was a three year project which started September 29, 2010. The original objective of our project was to deploy plug-in electric vehicles (PEV) and their charging infrastructure into our electric distribution territory to serve as a demonstration and research project. Our project studied the impact and barriers of installing charging stations (EVSEs).

The approach used in this project was to assist residential and business customer's purchase and install PEVs and EVSEs. We determined we needed both PEVs and EVSEs to obtain good representation of usage and impact. We wanted to offer as many charging opportunities to PEV drivers as possible.

We offered incentives to residential participants towards the purchase of a PEV and offered free EVSEs for both their home and place of work (if retired, where they "play" the most). We did not encounter many problems and none that were encountered were major. The main departure from our planned methodology was we were able to offer a couple extra spots for residential participants in our program. We finished with a total of 17 residential (only 16 took the incentive towards the PEV). All customers have a home EVSE and many have work locations. Not all employers or "play" locations would allow the installation of EVSE(s).

We worked with several business locations to purchase PEVs and install charging stations. We offered a slightly higher incentive to tax exempt business since they would not qualify for the tax rebate which applied towards PEV purchases. This made it possible for businesses to be able to purchase the PEV(s). We offered the purchase and installation of two charging stations per PEV. Many of our commercial customers opted not to purchase PEVs due to the high cost, but they partnered with us on the installation of EVSE(s). We had four (4) business locations with PEVs. Businesses had to purchase their vehicle(s) through Fleet at the Chevrolet dealerships and dealerships only received a limited number for fleet; this restricted the number available for business purchase.

The biggest deviation from our initial planned methodology was the purchase and installation of a dual charging solar carport. This is believed to be the first public setup of its kind in Michigan. This charging station has received a great deal of positive feedback and usage.

One assumption we made at the beginning of this project that proved to be somewhat inaccurate was regarding businesses. We believed business would willingly allow the installation of charging stations for workers and/or public if the EVSE and installation were provided for free. This was not always the case. Receiving commitments and negotiations on the contracts was often difficult, if not impossible. Insurance questions, liability issues, preferential parking, fees, charging expenses were issues we encountered. Also, many businesses resisted due to privileges being offered to PEV drivers, but not non-PEV drivers.

A variance from our planned methodology was that for one charging station we extended outside of our electric service distribution territory. We had one participant who worked outside our electric service and they had a restaurant near their work offer to house a charging station and allow our participant charge while at work. This helped with the portion of our project which was to bridge between communities. This provides one more opportunity for PEV drivers to stay on electric.

There were several different aspects of our project. In addition to the information provided above, below outlines costs, project activities and any websites and product developments from our project.

Cost Status:

Approved budget by budget period and actual costs incurred

If cost sharing is required break out by DOE share, recipient share and total costs.

Approved Budget – Budget Period 1 (Life of the project)			
Budget Category:	**DOE Share:**	**Recipient Share:**	**Total Costs:**
Personnel	$0	$65,982	$65,982
Fringe Benefits	$0	$0	$0

Travel	$12,000	$0	$12,000
Equipment	$349,600	$665,000	$1,014,600
Supplies	$16,000	$0	$16,000
Contractual, Sub-recipient	$222,400	$0	$222,400
Construction	$0	$0	$0
Other Direct Costs	$150,000	$0	$150,000
Indirect Charges	$0	$79,838	$79,838
Total Costs:	**$750,000**	**$810,820**	**$1,560,820**

Actual Budget

Budget Category:	**DOE Share:**	**Recipient Share:**	**Total Costs:**
Personnel		$228,276	$228,276
Fringe Benefits	$0	$0	$0
Travel	$9,542	$12	$9,554
Equipment	$375,327	$555,598.44	$925,762
Supplies	$24,175	$289	$24,464
Contractual, Sub-recipient	$185,504	$8,347	$193,851
Construction	$0	$0	$0
Other Direct Costs	$155,452	$0	$155,452
Indirect Charges	$0	$147,660	$147,660
Total Costs:	$750,000	$940,182.17	$1,690,182

Project Activities Status:

Milestones:	**Anticipated Completion Date:**	**Actual Completion Date:**
Finalize Home Installation Models	12/31/10	10/2010
Complete Participant Application / Questionnaire and email	12/31/10	12/10/10
Received completed Application / Questionnaires	01/15/11	12/23/10
Issued letters of Acceptance/Rejection	01/15/11	01/13/11
Pre-Qualification Bid Packages sent to Electrical Contractors	01/31/11	02/07/11
Pre-Qualification Packages Received Back	02/11/11	02/18/11
RFP's sent out	03/14/11	03/21/11
Pre-Bid Meeting	03/22/11	03/29/11
RFP's received Back	03/25/11	04/1/11
Award Contracts to Successful RFP Bidders	04/01/11	
Email sent to accepted participants requesting commitment to program by May 1, 2011	03/21/11	03/23/11
Commitments received from participants by May 1, 2011	05/1/11	05/11/11
Install 4 Residential EVSE	05/30/11	06/10/11
Ist Survey Completed	05/30/11	09/29/11

Email first survey to participants with home installation	10/30/11	
Residential PEV orders complete	12/31/11	12/28/11
11 of 13 home installations complete.	12/31/11	12/05/11
Work installs complete (MMA, Faith Catholic, Mall, Parking Ramp) – Mall and parking ramp have not committed.	12/31/11	12/31/11
Final Commitments for Community Partners	04/30/12	04/30/12
Plan participant forum & send invites	05/10/12	05/10/12
Install a few public/ work EVSE	06/30/12	06/30/12
Plan Electrical Contractor / Inspector Forum	06/30/12	2/15/13
Eaton Electrical Presentation	07/25/12	07/25/12
Install more commercial EVSE	09/30/12	09/28/12
Complete 3 more commercial installation	11/15/12	12/30/12
Received signed Agreements from St of Michigan and Lansing Township for EVSEs	11/30/12	11/3012
Create BWL PEV Facebook Page	01/01/13	01/30/13
Procure solar charging station	02/01/13	02/01/13
Install solar carport charger	05/30/13	04/23/13
Forum for Electrical Inspectors & Contractors	03/31/13	03/06/13
Solar Carport Chargers Launched	04/18/13	04/18/13
Impression 5 Display Complete	08/31/13	09/18/13
Final EVSE installs complete	08/31/13	09/24/13
Complete Flyer for EVSE Installs	08/15/13	incomplete
Project Completion	09/27/13	09/27/13

Products Developed Under the Award

Description of product produced or technology transfer activities accomplished during this reporting period, such as:

A. Publications (list journal name, volume, issue); conference papers; or other public releases of results. Attach or send copies of public releases to the DOE Program Manager identified in Block 15 of the Assistance Agreement Cover Page.

http://www.publicbroadcasting.net/wkar/news.newsmain/article/0/6649/1835031/WKAR.Features/BWL
http://www.tvworldwide.com/player.cfm?ID=13821&width=560&height=314&autostart=false

B. Web site or other Internet sites that reflect the results of this project.
http://www.lbwl.com/PEVintro.pdf
http://www.lbwl.com/PEVwhitepaper.pdf
http://www.lbwl.com/PEVintro.pdf (Update)

C. Networks or collaborations fostered.

Working with the Michigan Public Service Commission Taskforce to get Michigan "Plug-in Ready" visit website @ www.pluginmichigan.org

D. Technologies/Techniques.

None

E. Inventions/Patent Applications

F. Other products, such as data or databases, physical collections, audio or video, software or netware, models, educational aid or curricula, instruments or equipment.

Educational piece:

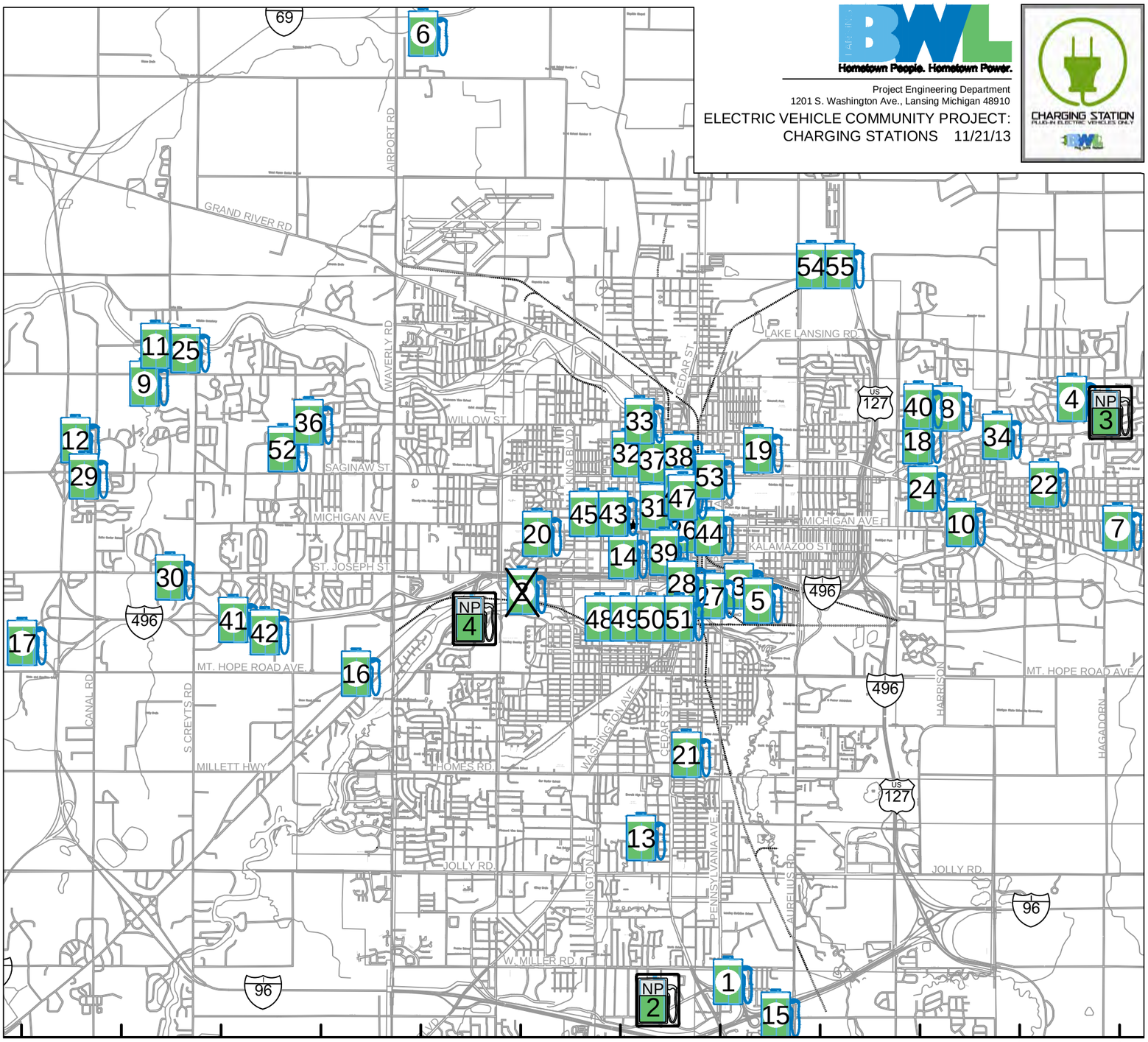
- H:\ame1\Electric Vehicles\Project Forms\Marketing Piece\ElectricVehicleGeneralBrochure.pdf
- PEVBookletForWeb.pdf
- Lansing City Market Solar Carport Charging Station Video: http://www.youtube.com/watch?v=XFIpIK6sy_A

Hometown People. Hometown Power.

Project Engineering Department
1201 S. Washington Ave., Lansing Michigan 48910

ELECTRIC VEHICLE COMMUNITY PROJECT: CHARGING STATIONS 11/21/13

CHARGING STATION
PLUG-IN ELECTRIC VEHICLES ONLY

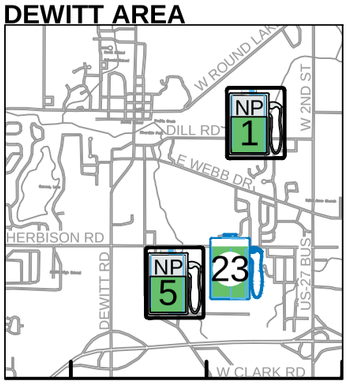


LANSING AREA

SCALE: 1" = 6000' OR: 1" = 1.137MILES

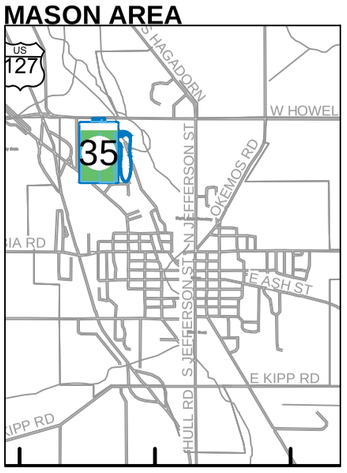
1 MILE (5280FT) INCREMENT

DEWITT AREA



1 MILE (5280FT) INCREMENT

MASON AREA



1 MILE (5280FT) INCREMENT

EXISTING NON-PARTICIPANTS

1.) 1320 LaCosta Drive Dewitt 48820	H983
2.) 200 E Edgewood Blvd Lansing 48911	H970
3.) 1500 Haslett Rd East Lansing 48823	H945
4.) 1485 Cambridge Rd Lansing MI 48911	H455
5.) 1467 Wellman Rd Dewitt 48820	H983

EXISTING SITES

	CIRCUIT I.D.
1.) 6545 Mercantile Way Lansing 48909	H942
~~2.) 1720 Moores River Drive Lansing 48910~~	~~H207~~
3.) 1232 Haco Drive - North Lot Lansing 48912	H507
4.) 1401 Dennison Road East Lansing 48823	H945
5.) 1232 Haco Drive - South Lot Lansing 48912	H507
6.) 3455 Donamere Drive Lansing 48906	H958
7.) 217 Oakland Drive East Lansing 48823	H917
8.) 1150 Chartwell Carriage Way S East Lansing 48823	H956
9.) 7136 Willow Woods Circle Lansing 48917	H921
10.) 55 South Harrison Rd East Lansing 48823	MSU Distribution
11.) 7000 W. Willow Hwy Lansing 48823	H921
12.) 7710 W. Saginaw Hwy (Admin. East) Lansing 48917	H927
13.) 121 E. Jolly Road Lansing 48910	H937
14.) 620 South Capitol Avenue Lansing 48933	H506
15.) 1924 Fairmont Lansing 48911	H940
16.) 2405 East Libbie Drive Lansing 48917	H930
17.) 8650 W. Mt. Hope Hwy Grand Ledge 48837	H929
18.) 873 Audubon Road East Lansing 48823	H991
19.) 1500 East Saginaw Street Lansing 48906	H989
20.) 416 Everett Drive Lansing 48915	FORBES 74

EXISTING SITES CONTINUED

	CIRCUIT I.D.
21.) 600 E. Holmes Rd Lansing 48910	CREST 1
22.) 737 Chittenden Drive East Lansing 48823	H951
23.) 1555 Agnes Glenn Circle Dewitt 48820	H983
24.) 403 Kensington East Lansing 48823	FRND 3
25.) 7000 W. Willow Hwy (Garage) Lansing 48917	H921
26.) 240 Museum Drive Lansing MI 48933	CEDAR 43
27.) 1140 S. Pennsylvania Lansing MI 48912 (METERING LOCATION)	H507
28.) 730 E. Hazel - CP&D Lansing MI 48912	H507
29.) 7710 W. Saginaw Hwy (Admin. West) Lansing 48917	H927
30.) 1118 Centennial Way Lansing 48917	H934
31.) 201 S. Grand Ave Lansing 48933	CEDAR 20
32.) Corner of Seymour Street/ Saginaw (1)	CEDAR 28
33.) Corner of Seymour Street/ Saginaw (2)	CEDAR 28
34.) 950 Abbot Rd East Lansing 48823	H952
35.) 660 N. Cedar St Mason 48854	BWL SERVICE N/A
36.) 5130 Davenport Drive Lansing 48917	H985
37.) 124 W. Michigan Ave Lansing 48933	CEDAR 49
38.) 312 N Cedar Lansing 48912	H985
39.) 603 South Washington Ave Lansing 48933	H507
40.) 1372 Lakeside Dr, East Lansing 48823	H956
41.) 5708 Cornerstone Drive (1) Lansing MI 48917	H931
42.) 5708 Cornerstone Drive (2) Lansing MI 48917	H931
43.) 227 South Pine, Lansing MI 48915	H502 & H961
44.) 702 W Kalamazoo St, Lansing MI 48915	H967
45.) 731 West Allegan St, Lansing MI 48915	H506
46.) 325 East Michigan Ave Lansing 48933 (Solar)	CEDAR 43
47.) 325 East Michigan Ave Lansing 48933 (Solar)	CEDAR 43
48.) 1201 S. Washington Ave (Co- Gen. Plant), Lansing MI	H507
49.) 1201 S. Washington Ave (Co- Gen. Plant), Lansing MI	H507
50.) 1201 S. Washington Ave (Co- Gen. Plant), Lansing MI	H507
51.) 1201 S. Washington Ave (Co- Gen. Plant), Lansing MI	H507
52.) 5330 W. Saginaw Hwy Lansing 48917	H957
53.) 219 North Grand Ave (Ramp) Lansing 48933	H927
54.) 2328 Showtime Drive (Dual) Lansing MI 48912	H990
55.) 2328 Showtime Drive (Tesla) Lansing MI 48912	H990

LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: 7/31/2013

Participant Name: Board of Water and Light
Address: 1201 S. Washington Ave.
Lansing, MI

EVSE Number (filled in by Project Administrator): 48

Serial Number: 169402G01001010000

Project Location (Description):

1. Physical Location: Office building – remodeled train depot parking lot.
   _____
2. Surrounding Area: Commercial and residential
   _____
3. Adjacent Structures: Historical renovated train depot building
   _____

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

Land Use:

1. Characterize Present land use where the proposed project would be located:

X	Urban	X	Industrial	X	Commercial		Agricultural
	Suburban		Rural	X	Residential		Research Facility
	Forest		University Campus		Other_____		

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.
3.

Standard parking space size. Lined with green paint and has a green plug decal in the center.

_____

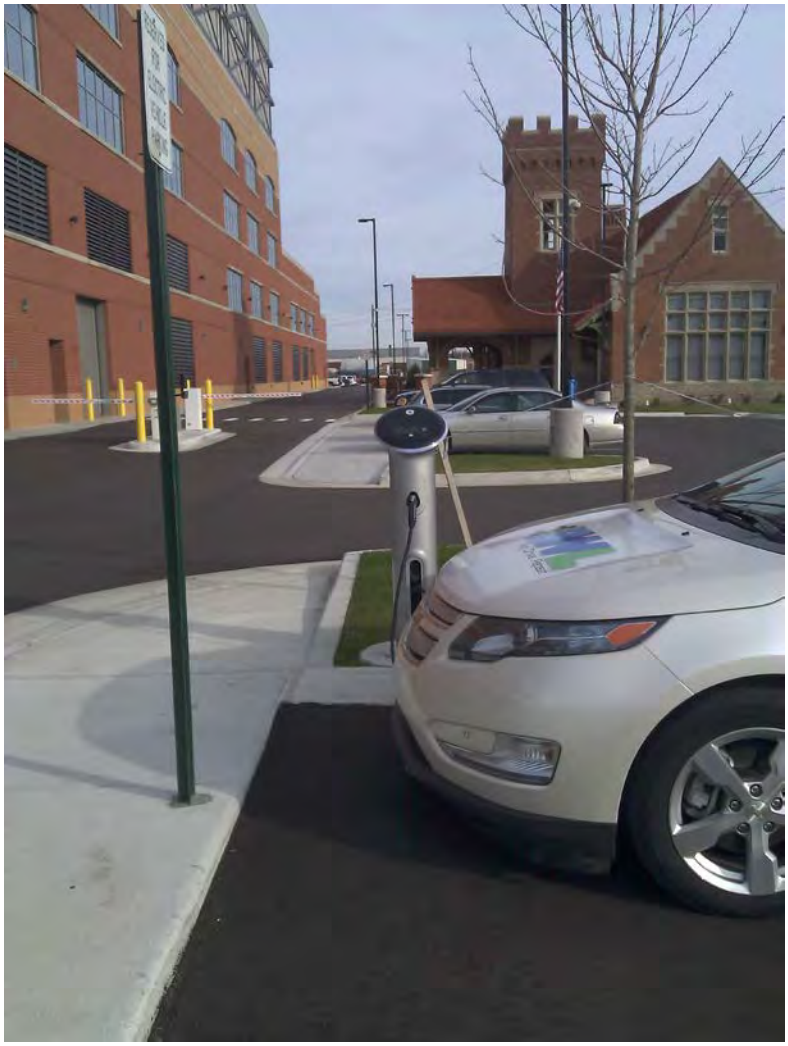
_____

_____

Provide Photo: Attachment ____

4. Describe planned construction, installation and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, etc.

   Charging station was installed during construction of the new facility.



LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: 7/31/2013

Participant Name: Board of Water and Light
Address: 1201 S. Washington Ave.
Lansing, MI

EVSE Number (filled in by Project Administrator): 49, 50, & 51

Serial Number: 169402G01001030000
169402G01001040000
169402G01001050000

Project Location (Description):

1. Physical Location: Office building and power plant parking lot.
   _____
2. Surrounding Area: Commercial and residential
   _____
3. Adjacent Structures: Historical renovated train depot building
   _____

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

Land Use:

1. Characterize Present land use where the proposed project would be located:

X	Urban	X	Industrial	X	Commercial		Agricultural
	Suburban		Rural	X	Residential		Research Facility
	Forest		University Campus		Other_____		

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.

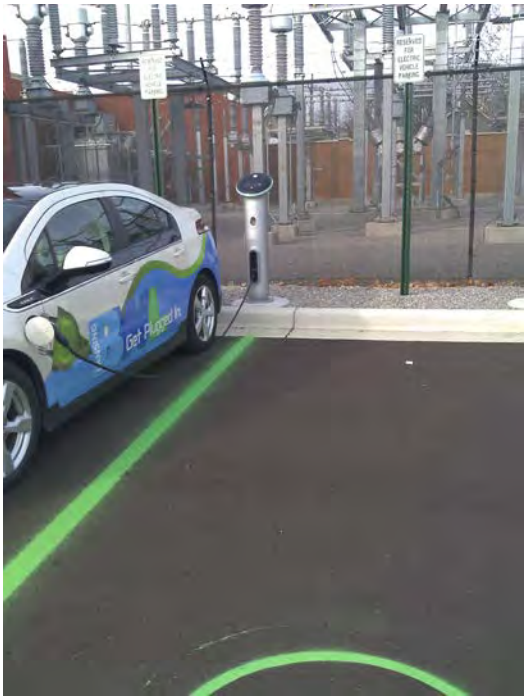
3.

Three standard parking spaces. Pedestal units. Parking space are line in green with a plug decal in the center.

Provide Photo: Attachment ____

4. Describe planned construction, installation and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, etc.

Charging stations were installed during construction of the facility.



LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: 10/24/2014
Participant Name: Rouse Properties, Lansing Mall
Address: 5316 West Saginaw Hwy.
Lansing, MI, 48917

EVSE Number (filled in by Project Administrator): 52

Serial Number: 169402G01001010000

Project Location (Description):

1. Physical Location: Shopping Mall parking lot.
   _____
2. Surrounding Area: Commercial and residential
   _____
3. Adjacent Structures: Applebee's restaurant
   _____

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

Land Use:

1. Characterize Present land use where the proposed project would be located:

[ ]	Urban	[ ]	Industrial	[X]	Commercial	[ ]	Agricultural
[X]	Suburban	[ ]	Rural	[X]	Residential	[ ]	Research Facility
[ ]	Forest	[ ]	University Campus	[ ]	Other_____		

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.
   _____
   _____

_____

_____

Provide Photo: Attachment _X___

3. Describe planned construction, installation and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, etc.

_____

_____

_____

_____

LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: Attempted 09/23/13 – Still having issues, working with Eaton to get them resolved.

Participant Name: City of Lansing / N. Grand Ave. parking ramp
Address: 201 N. Grand Ave.
Lansing, MI 48933

EVSE Number (filled in by Project Administrator): 53
Serial Number:

Project Location (Description):

1. Physical Location:
   Enter ramp entrance off Ottawa St. The charging station is located, on the wall, at the 1st parking spot on the left.

2. Surrounding Area:
   Commercial buildings surrounding the area. In Lansing, MI downtown area.

3. Adjacent Structures:
   Radisson Hotel and the Accident Fund's corporate headquarters.

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

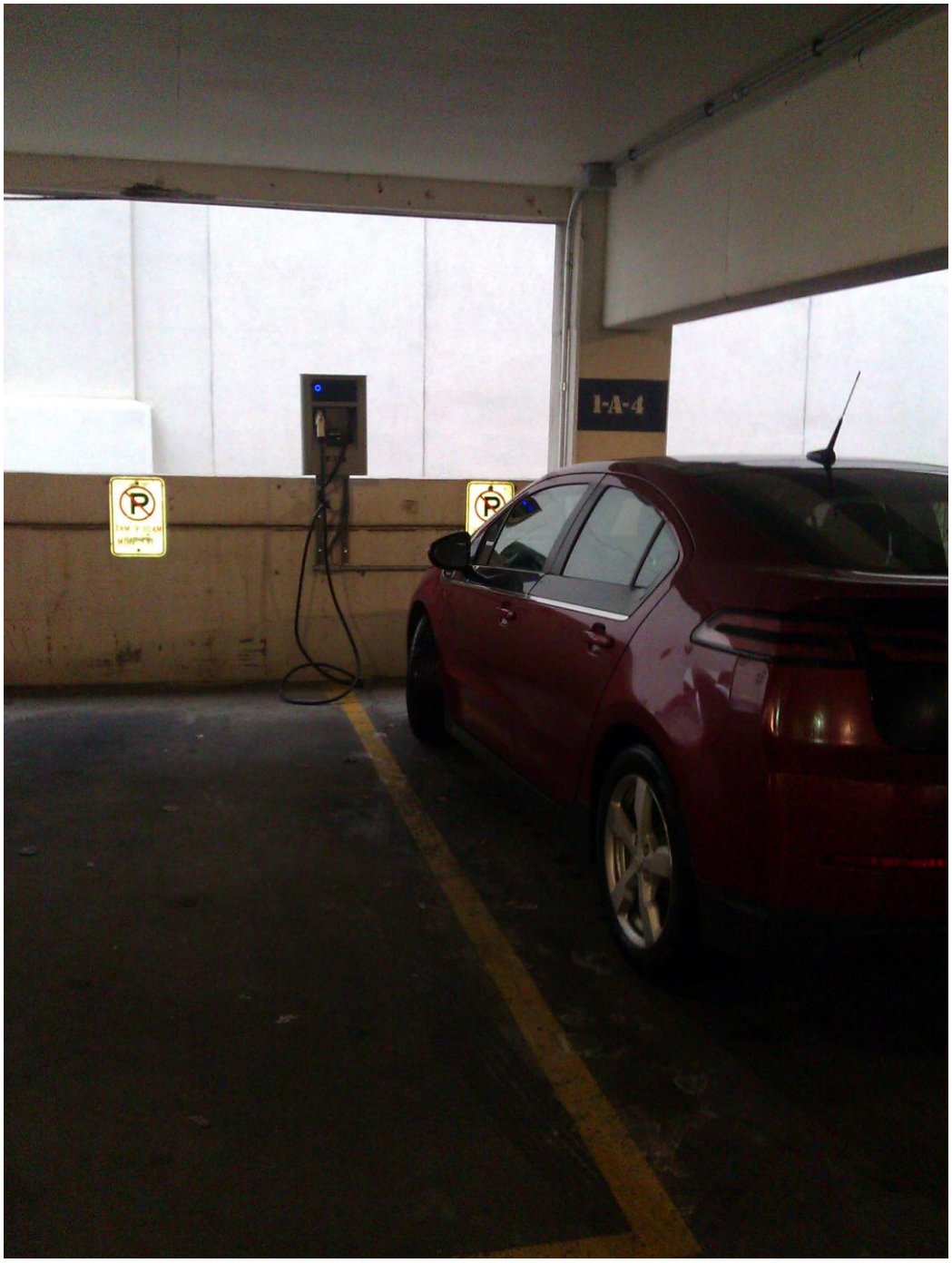
Land Use:

1. Characterize Present land use where the proposed project would be located:

x	Urban		Industrial	x	Commercial		Agricultural
	Suburban		Rural		Residential		Research Facility
	Forest		University Campus		Other_____		

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.
   Large parking ramp, only about a 3 ft by 3 ft area needed for the charging station and a dedicated parking space.

Provide Photo: Attachment __x__



LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: Not completed yet. Parking ramp is still not opened.

Participant Name: Lansing Township
Address: 2501 Showtime Drive
Lansing, MI

EVSE Numbers (filled in by Project Administrator): 54 & 55

Serial Numbers: PEP Station _____ Tesla _____

Project Location (Description):

1. Physical Location: The EVSEs are on the Northeast end of the third floor of the new parking ramp at Eastwood Town Center. This is an outdoor commerce center with many businesses including restaurants, retail stores, theaters and a Hotel.

2. Surrounding Area: Commercial and residential.

3. Adjacent Structures: Retail buildings and a Hotel

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

Land Use:

1. Characterize Present land use where the proposed project would be located:

[ ] Urban	[ ] Industrial	[x] Commercial	[ ] Agricultural
[ ] Suburban	[ ] Rural	[ ] Residential	[ ] Research Facility
[ ] Forest	[ ] University Campus	[ ] Other_____	[ ]

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.

   This is a five story structure with retail space on the ground floor and 4 stories of parking above the retail space. The charging stations use 3 parking spots on the third floor of the parking ramp.

Provide Photo: Attachment ____ - Not available at this time.

3. Describe planned construction, installation and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, etc.

_____
_____
_____
_____

LBWL Electric Vehicle Supply Equipment (EVSE)
Site Information

Commission Date: 7/31/2013

Participant Name: Board of Water and Light
Address: 1201 S. Washington Ave.
Lansing, MI

EVSE Number (filled in by Project Administrator): 56

Serial Number: # 135978416

Project Location (Description):

1. Physical Location: Office building – Lower parking garage.
   _____
2. Surrounding Area: Commercial and residential
   _____
3. Adjacent Structures: Historical renovated train depot building
   _____

Project Location (Provide):

1. Project site location map of the project work area: Attachment __
2. Project site photos (only if requested for further review) : Attachment ___
3. Topographical maps (only if requested for further review) : Attachment ___

Land Use:

1. Characterize Present land use where the proposed project would be located:

X	Urban	X	Industrial	X	Commercial		Agricultural
	Suburban		Rural	X	Residential		Research Facility
	Forest		University Campus		Other_____		

2. Identify Total size of the facility, structure, or system and what portion will be used for the project.
3. Standard parking space size. Lined with green paint and has a green plug decal in the center.

Provide Photo: Attachment __X__

4. Describe planned construction, installation and/or demolition activities, i.e., roads, utilities system right-of-ways, parking lots, buildings, etc.

   Charging station was installed during construction of the new facility.

LBWL Plug-In Electric Vehicle Community Project

Impression 5 Science Museum Plug-in Electric Vehicle Display

Plug. Drive. Repeat.

Photos of Assembly

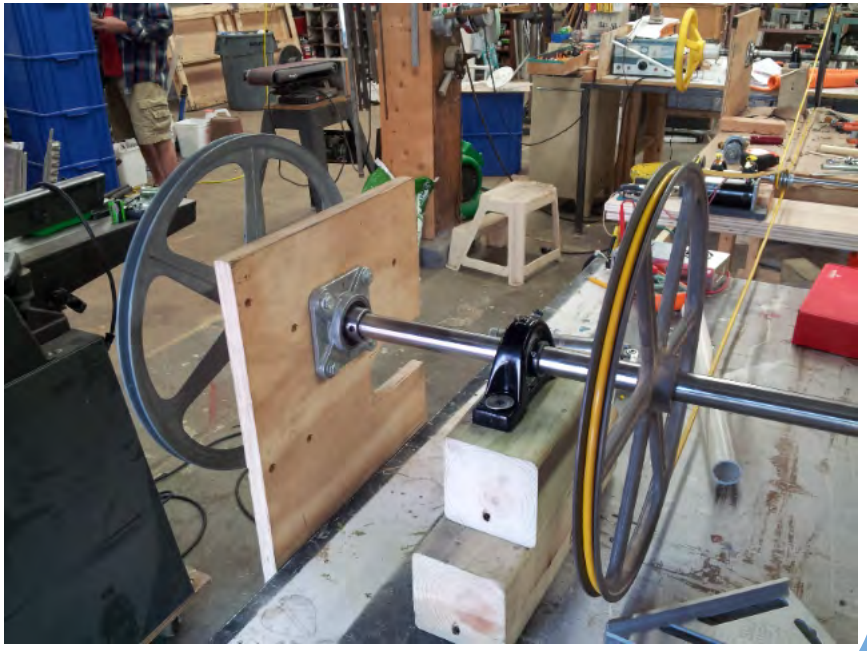
Motor to make it run.

Measurements

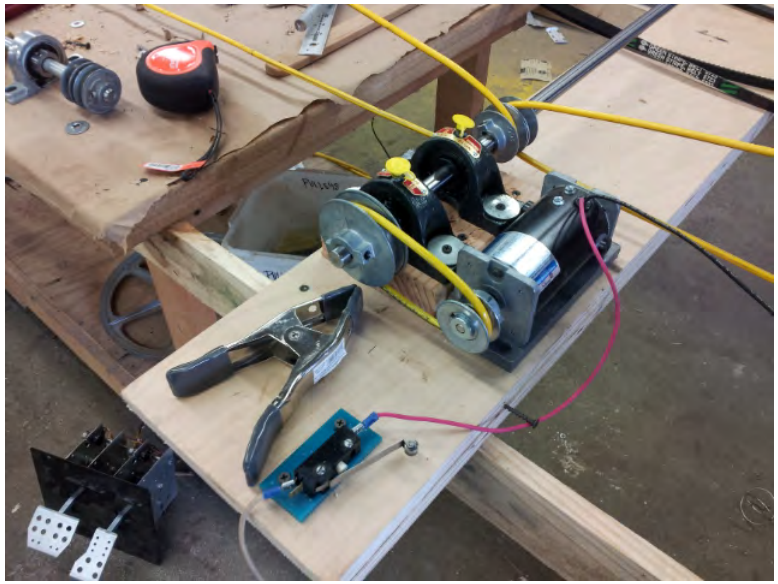
Measurements for size

Under Construction

- Wheel Drive



Under Construction



- Making it work

Under Construction

- Making it work

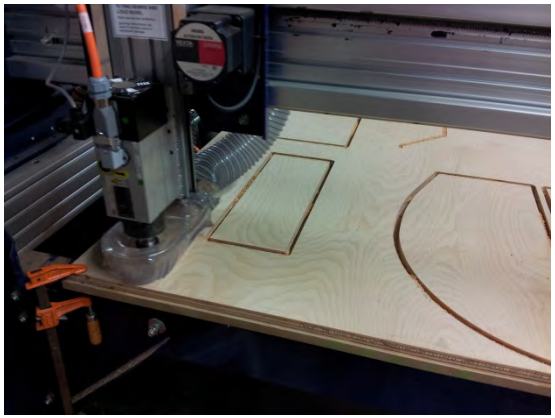
Under Construction

- If you build it they will come…

Under Construction

- If you build it they will come…

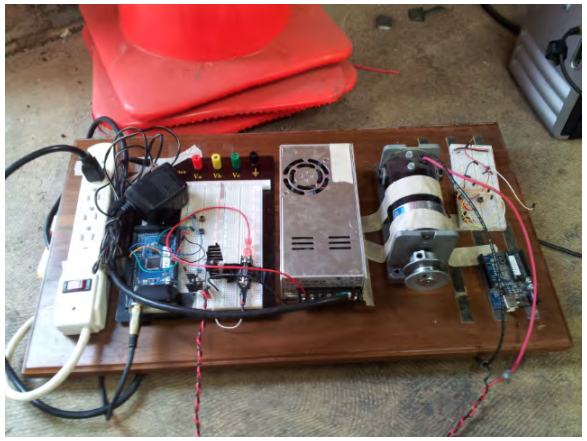
Under Construction

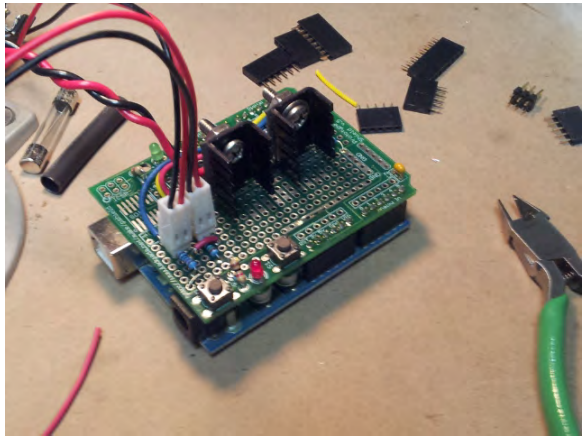


Under Construction

- Starting to take shape.

Under Construction

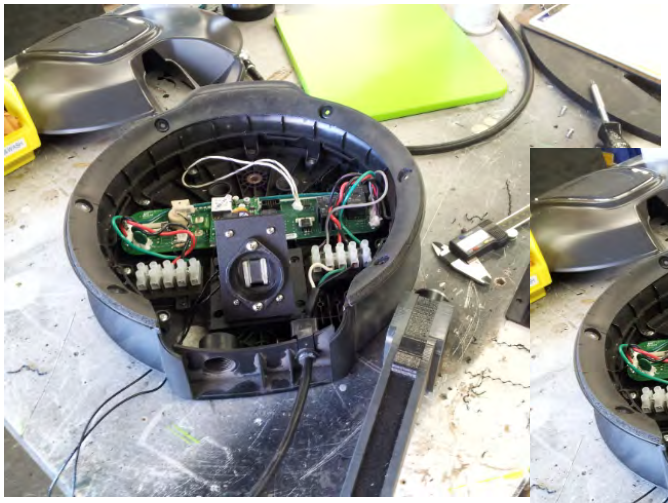


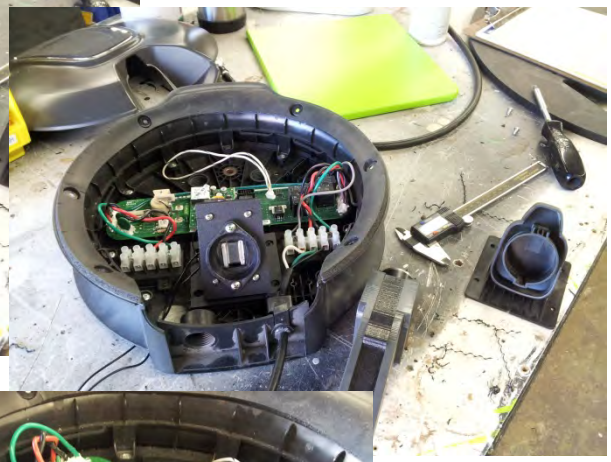


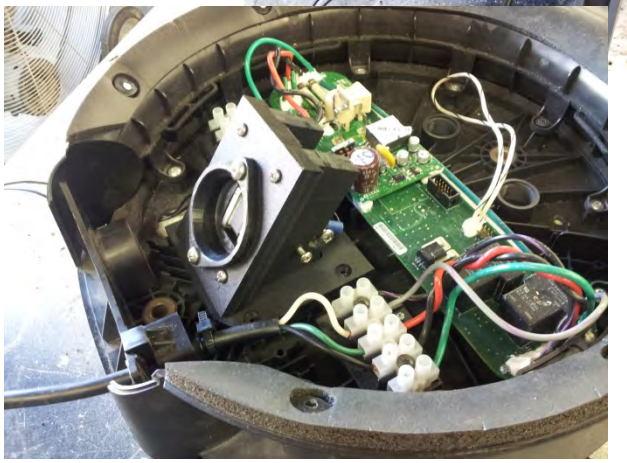
Under Construction

- Looks like fun…

Under Construction

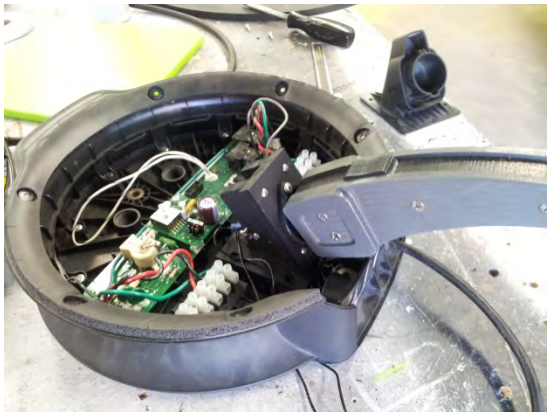






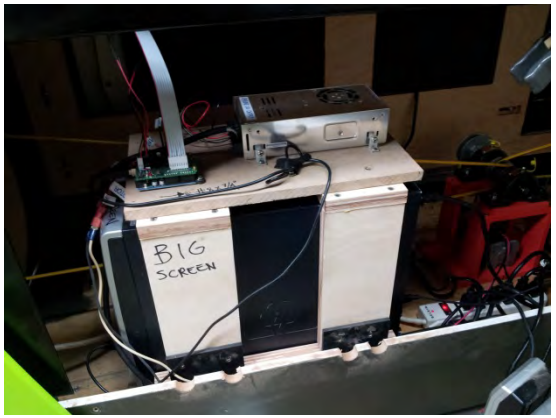
- Charging station modifications

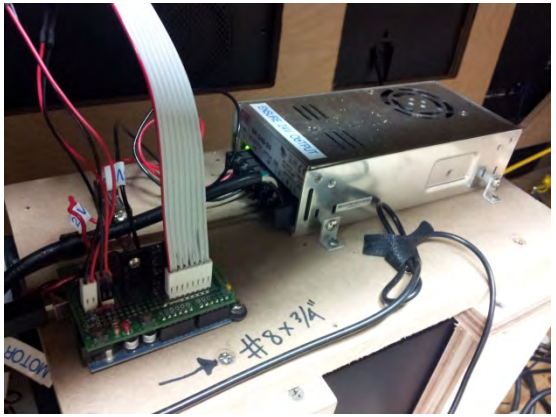
Under Construction



- Let's plug in…

Under Construction





Finished Product

Finished Product

- Here they are…

Go Electric…Get Charged.

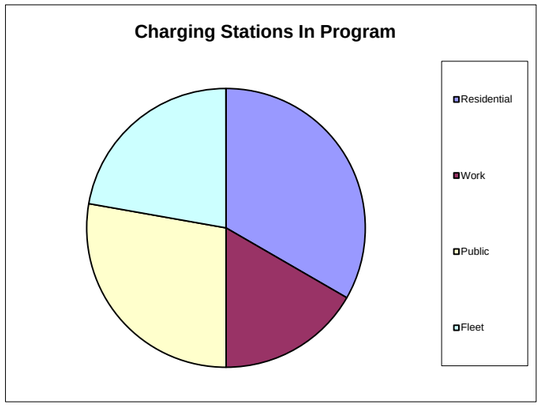
Lansing Board of Water and Light
Plug In Initiative™

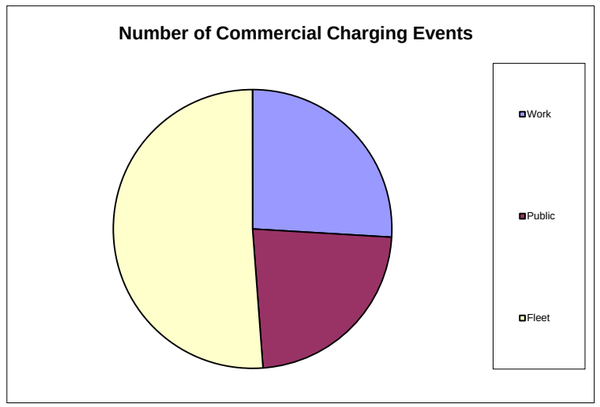
General Program Information as of 09/27/13

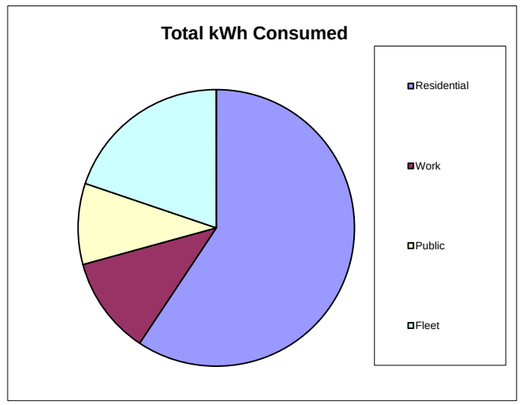
Number of Vehicle in BWL Program	**23**

Level 2

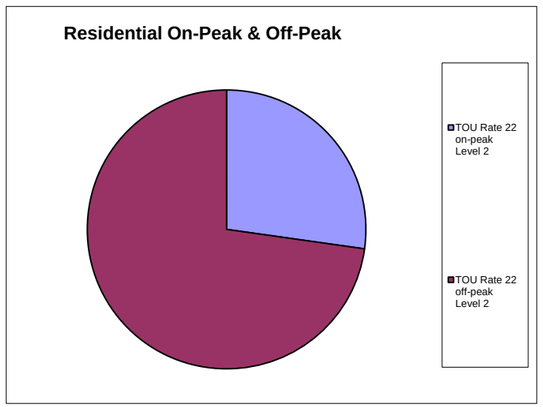
	Residential	Work	Public	Fleet	Totals	
Number of Charging Stations	18	9	15	12	**54**	
Total Number of Charging Events this quarter		329	290	649.5	**1269**	
Total kWh Consumed this quarter	8,333	1,601	1,330	2,780	**14,043**	







	TOU Rate 22 on-peak Level 2	TOU Rate 22 off-peak Level 2					
Total Residential Customers Quarterly kWh	2669	7135					

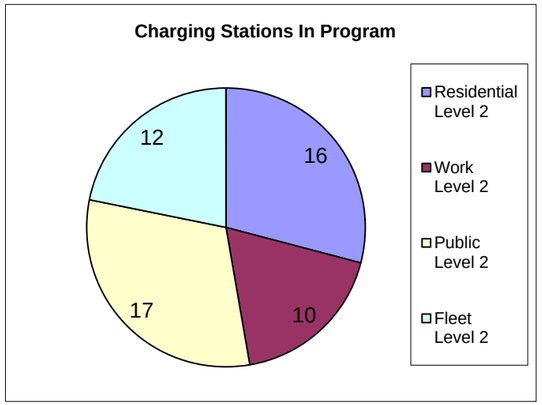


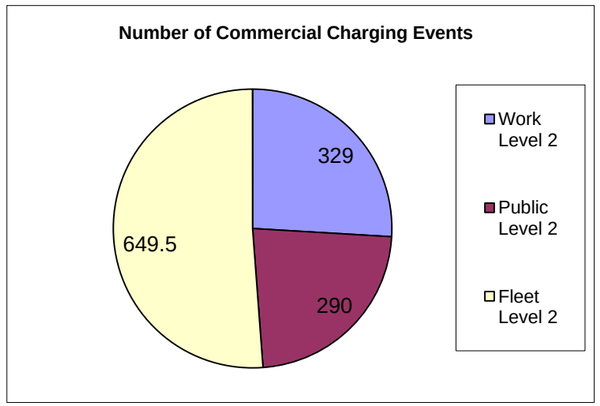
Lansing Board of Water and Light
Plug In Initiative™

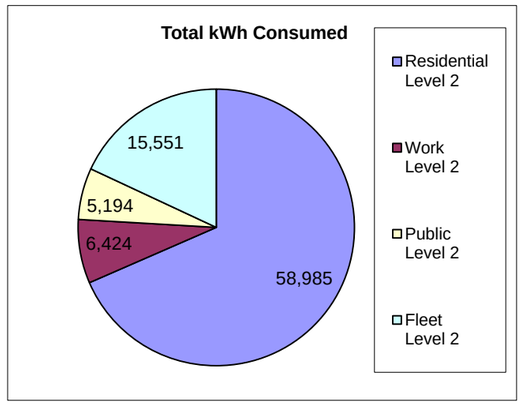
General Program Information as of 09/27/13

Number of Vehicle in BWL Program	**23**

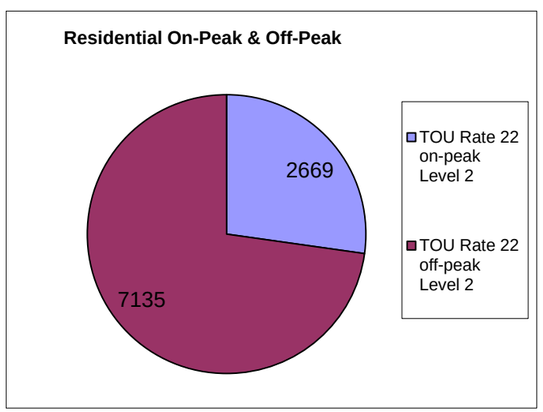
	Residential Level 2	Work Level 2	Public Level 2	Fleet Level 2	Totals
Number of Charging Stations	16	10	17	12	**55**
Total Number of Charging Events this quarter		329	290	649.5	**1269**
Total kWh Consumed this quarter	58,985	6,424	5,194	15,551	**86,155**







	TOU Rate 22 on-peak Level 2	TOU Rate 22 off-peak Level 2					
Total Residential Customers Quarterly kWh	2669	7135					



		Q1 2012									Q2 2012								
EVSE Number	**Customer**	Jan			Feb			Mar			Apr			May			Jun		
		on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total
2	Lee - Home							24	35	59	125	220	345	57	130	187	37	101	138
40	Lee - Home							24	35	59	125	220	345	57	-57				
6	Stehouwer - Home		0		7	-7		15	231	246	3	227	230	6	303	309	9	253	262
7	Poli - Home		0			0		20	160	180	46	94	140	7	114	121	39	113	152
8	Kohl - Home		0			0		3	63	66	3	71	74	3	43	46	3	41	44
9	Anderton - Home		0			0		0	116	116	2	123	125	0	193	193	9	132	141
13	Sorg - Home		0			0		91	201	292	38	248	286	31	244	275	28	309	337
15	Tennis - Home		0			0		0	188	188	6	155	161	11	136	147	33	181	214
16	McQuaid - Home		0			0		68	56	124	156	96	252	105	144	249	159	56	215
17	Kane - Home		0			0		35	59	94	12	173	185	2	125	127	7	160	167
18	Worthy - Home		0			0		32	110	142	120	201	321	113	88	201	53	158	211
20	Pratt - Home							3	253	256	3	335	338	3	386	389	3	333	336
21	Eltzroth - Home		0			0		52	151	203	11	107	118	59	186	245	61	169	230
22	Smith - Home		0			0		35	38	73	0	28	28	0	46	46	4	62	66
23	Fedewa - Home		0			0		5	147	152	60	119	179	30	161	191	37	176	213
24	Callis, April							3	62	65	3	329	332	3	331	334	3	203	206
	Monthly Totals	0	0	0	7	-7	0	410	1905	2315	713	2746	3459	487	2573	3060	485	2447	2932

Quarterly Total	**2315**	**9451**
on-peak	**417**	**1685**
off-peak	**1898**	**7766**
% of off-peak:	82%	82%

Smart Units

Dumb Units

Unknown

4	Lark - Home	179.42	15.046	194.466	178.912	12.471	191.383	69.195	0	69.195	75.274	0	75.274	65.498	11.663	77.161	107.958	22.385	130.343

Quarterly Total	**455**	**283**
on-peak	**428**	**249**
off-peak	**28**	**34**
% of off-peak:	6%	12%

	Q3 2012									Q4 2012									
Customer	Jul			Aug			Sep			Oct			Nov			Dec			
	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak
Lee - Home	42	83	125	9	5	14		0			0			0			0		
Lee - Home								0		0	0	0	3	93	96	3	121	124	25
Stehouwer - Home	29	316	345	50	245	295	28	285	313	85	271	356	45	320	365	65	335	400	79
Poli - Home	5	194	199	7	126	133	3	179	182	4	190	194	21	237	258	3	268	271	8
Kohl - Home	2	88	90	3	53	56	3	52	55	3	66	69	3	76	79	5	89	94	3
Anderton - Home	28	171	199	11	183	194	10	157	167	39	169	208	14	245	259	19	186	205	5
Sorg - Home	100	259	359	29	285	314	29	285	314	27	255	282	35	293	328	46	342	388	145
Tennis - Home	32	119	151	33	89	122		0		50	151	201	32	221	253	53	201	254	53
McQuaid - Home	156	125	281	152	105	257	231	92	323	220	113	333	265	85	350	196	54	250	160
Kane - Home	2	110	112	4	93	97	15	148	163	23	133	156	8	99	107	48	137	185	16
Worthy - Home	63	191	254	65	121	186	84	172	256	111	217	328	127	214	341	102	242	344	33
Pratt - Home	3	355	358	3	293	296	32	264	296	39	269	308	10	175	185	45	257	302	68
Eltzroth - Home	20	170	190	36	243	279	36	243	279	110	155	265	52	171	223	113	212	325	113
Smith - Home	2	79	81	10	49	59	0	50	50	0	63	63	4	58	62	19	67	86	12
Fedewa - Home	6	82.05	144	44	136	180	27	183	210	59	150	209	65	193	258	54	283	337	24
Callis, April	3	87	90	3	196	199	67	29	96	6	7	13	12	5	17	0	0	0	24
Monthly Totals	493	2429.05	2978	459	2222	2681	565	2139	2704	776	2209	2985	696	2485	3181	771	2794	3565	768

Quarterly Total	**8363**	**9731**	
on-peak	**1517**	**2243**	
off-peak	**6790.05**	**7488**	
% of off-peak:	81%	77%	

Smart Units

Dumb Units

Unknown

Lark - Home	77.769	10.744	88.513	40.352	9.779	50.131	85.098	0	85.098	135.635	0	135.635	155.94	36.668	192.608	205.791	22.842	228.633	229.976

Quarterly Total	**224**	**557**	
on-peak	**203**	**497**	
off-peak	**21**	**60**	
% of off-peak:	9%	11%	

	Q1 2013								Q2 2013											
Customer	Jan		Feb			Mar			Apr			May			Jun			July	
	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak	total	on-peak	off-peak
Lee - Home																			
Lee - Home	48	73	38	111	149	18	98	116	19	61	80	26	13	39	9	8	17	39	44
Stehouwer - Home	226	305	36	318	354	48	492	540	34	481	515	3	499	502	9	369	378	6	427
Poli - Home	235	243	3	195	198	3	234	237	3	220	223	3	182	185	15	168	183	3	107
Kohl - Home	86	89	3	54	57	3	83	86	3	55	58	3	68	71	3	66	69	3	71
Anderton - Home	269	274	3	193	196	5	122	127	8	219	227	10	141	151	0	195	195	31	130
Sorg - Home	281	426	81	272	353	66	257	323	108	265	373	52	263	315		0		76	250
Tennis - Home	137	190	129	102	231	99	111	210	69	45	114	50	90	140	53	110	163	70	109
McQuaid - Home	56	216	187	91	278	196	109	305	171	116	287	149	104	253	123	86	209	132	91
Kane - Home	99	115	24	109	133	9	79	88	53	172	225	19	123	142	61	90	151	23	135
Worthy - Home	67	100	74	167	241	128	238	366	112	170	282	112	189	301	92	91	183	100	103
Pratt - Home	222	290	62	267	329	17	74	91	72	250	322	53	224	277	36	224	260	39	172
Eltzroth - Home	212	325	100	207	307	55	197	252	76	172	248	107	154	261	74	107	181	107	187
Smith - Home	77	89	8	62	70	8	42	50	1	32	33	0	45	45	8	54	62	0	50
Fedewa - Home	206	230	16	211	227	26	239	265	26	161	187	30	152	182	100	155	255	43	95
Callis, April	26	50	80	42	122	142	105	247	138	62	200	61	76	137	58	73	131	59	38
Monthly Totals	2247	3015	844	2401	3245	823	2480	3303	893	2481	3374	678	2323	3001	641	1796	2437	731	2009

Quarterly Total	**9563**	**8812**	
on-peak	**2435**	**2212**	
off-peak	**7128**	**6600**	
% of off-peak:	75%	75%	

Smart Units

Dumb Units

Unknown

Lark - Home	1.343	229.976	153.23	0	153.23	38.927	0	38.927	195.772	7.07	202.842	125.967	8.625	134.592	138.911	0	138.911	133.837	2.272

Quarterly Total	**422**	**476**	
on-peak	**422**	**461**	
off-peak	**1**	**16**	
% of off-peak:	0%	3%	

Q3 2013

Customer		Aug			Sept			Total Year
	total	on-peak	off-peak	total	on-peak	off-peak	total	
Lee - Home								868
Lee - Home	83	41	19	60	95	75	170	1411
Stehouwer - Home	433	1	400	401	28	409	437	6986
Poli - Home	110	3	124	127	8	160	168	3504
Kohl - Home	74	7	67	74	8	36	44	1295
Anderton - Home	161	15	174	189	20	169	189	3516
Sorg - Home	326	68	238	306	68	247	315	5912
Tennis - Home	179	44	69	113	48	105	153	3184
McQuaid - Home	223	121	59	180	159	85	244	4829
Kane - Home	158	4	147	151	26	173	199	2755
Worthy - Home	203	74	163	237	64	143	207	4704
Pratt - Home	211	16	217	233	17	201	218	5295
Eltzroth - Home	294	17	73	90	8	242	250	4565
Smith - Home	50	0	0	0	0	13	13	1026
Fedewa - Home	138	31	203	234	65	182	247	4038
Callis, April	97	31	14	45	24	34	58	2439
Monthly Totals	2740	473	1967	2440	638	2274	2912	56327

Quarterly Total	**8092**	56327
on-peak	**1842**	12351
off-peak	**6250**	43920.05
% of off-peak:	77%	78%

Smart Units

Dumb Units

Unknown

Lark - Home	136.109	91.23	4.479	95.709	9.134	0	9.134	2090.077

Quarterly Total	**241**	2658
on-peak	**234**	2494
off-peak	**7**	165
% of off-peak:	3%	6%

		Q1 2012						Q2 2012						Q3 2012					
Customer		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep	
		# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh
Work (Private non-residential)																			
Poli - Work	Clipper																		
Lark - Work	Leviton	0	0	8	37.022	3	20.568	2	2.356	12	43.84	1	4.56	0	0	1	3.188	4	19.083
BWL - Work Garage	Eaton																		
Lee - Work (MMA)	Blink	3	7.617	16	7	2	12.429	6	23.141	1	7.823	15	80.4	13	57.787	19	67.559	18	83.728
McQuaid - Work (Faith Catholic)	Blink	12	42.892	28	107.402	17	59.896	31	94.848	14	42.102	33	82.462	37	122.682	34	88.425	0	0
MI Laborers District Counsel	Blink															11	107.74	11	85.271
S. Grand Ramp	Leviton													2	23.0962	6	50.616	3	25.204
Michigan Retailers Association	Eaton																		
State of Michigan - Pine St	Eaton																		
East Lansing, City Hall	Eaton																		
Totals		15	50.509	52	151.424	22	92.893	39	120.345	27	93.765	49	167.422	52	203.5652	71	317.528	36	213.286

Quarterly Totals (kWh)	**294.826**	**381.532**	**734.3792**
Quarterly # Events	**89**	**115**	**159**

Public																			
MSU - Kellogg Center Ramp	Eaton	1	1.91	1	5.46	4	45.65	1	12.84	6	29.35	2	7.07			3	32.79	8	79.26
Impression 5	Leviton									8	18.326	9	34.437	10	35.458	7	26.128	9	33.066
Delta Township 4- West Admin	Leviton											16	32.715	9	13.753	8	10.956	3	7.769
LCC - Lot A (7599)	Eaton																	1	0.11
LCC - Lot A (7600)	Eaton																	1	1.03
LCC - West Campus	Eaton																	1	0.11
LCC - West Campus	Eaton																	1	1.03
East Lansing Library	Eaton																	1	1.76
Big Boy	Eaton																	0	0
Michigan Historical Center	Eaton																		
St. of Michigan - Allegan Lot	Eaton																		
City Market	Eaton																		
City Market	Eaton																		
Delta Township - Library	Blink																		
North Grand Ramp	Eaton																		
Lansing Mall	GE																		
Peoples Church	Leviton																		
Totals		1	1.91	1	5.46	4	45.65	1	12.84	14	47.676	27	74.222	19	49.211	18	69.874	25	124.135

Quarterly Totals (kWh)	**53.02**	**134.738**	**243.22**
Quarterly # Events	**6**	**42**	**62**

Fleet																			
BWL Fleet - Cust Serv	Leviton	10	79.639	6	46.029	19	89.633	14	51.121	6	15.002	18	93.921	15	69.081	17	128.107	13	80.636
Delta Township 1 - Util Fleet	Blink	39	180.56	31	166.279	52	224.515	42	178.46	70	243.304	57	162.81	78	255.765	65	218.76	5	161.97
Delta Township 2 - Admin East	Blink			7	323.506	26	140.157	25	119.145	35	198.276	17	128.174	21	126.574	25	155.299	18	137.605
Delta Township 3 - Garage	Blink											1	10.54						
BWL Fleet - Metering	Leviton							2	15.245	17	272.461	24	473.84	12	339.587	16	372.437	17	411.654
BWL Fleet - CP&D	Schneider																		
City Hall, Lansing	Coulomb																		
City Lansing, Garage	Coulomb																		
REO - back lot	GE																		
REO - back lot	GE																		
REO - back lot	GE																		
REO - visitor lot	GE																		
Totals		49	260.199	44	535.814	97	454.305	83	363.971	128	729.043	117	869.285	126	791.007	123	874.603	53	791.865

Quarterly Totals (kWh)	**1250.318**	**1962.299**	**2457.475**
Quarterly # Events	**190**	**328**	**302**

:averages were used (not all locations were included)

		Q4 2012						Q1 2013						Q2 2013						Q3 2013			
Customer		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		July		Aug	
		# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh	# Events	total kWh
Work (Private non-residential)																							
Poli - Work	Clipper																						
Lark - Work	Leviton	2	8.228	8	25.592	1	3.007	7	39.154	2	16.115	14	79.54	0	0	0	0	2	0.626	1	0.336	17	83.394
BWL - Work Garage	Eaton																						
Lee - Work (MMA)	Blink	0	0	0	0	0	0	14	79.54	14	79.54	14	79.54	27	131.0474	26	118.6124	22	101.9604	28	94.331	10	36.53
McQuaid - Work (Faith Catholic)	Blink	0	0	0	0	0	0	14	79.54	14	79.54	14	79.54	9	108.96	9	108.96	9	108.96	14	69.59	14	69.59
MI Laborers District Counsel	Blink	11	67.665	4	27.338	10	61.147	15	115.59	18	138.531	15	99.688	13	131.3416	19	146.6523	15	144.5643	10	104.549	12	80.071
S. Grand Ramp	Leviton	6	43.885	18	69.529	12	39.955	20	97.012	19	71.352	14	58.901	18	73.203	18	48.257	14	85.007	17	65.722	12	41.178
Michigan Retailers Association	Eaton							14	79.54	14	79.54	14	79.54	9	108.96	9	108.96	9	108.96	14	69.59	14	69.59
State of Michigan - Pine St	Eaton																			0	0	13	71.543
East Lansing, City Hall	Eaton																			14	69.59	14	69.59
Totals		19	119.778	30	122.459	23	104.109	84	490.376	81	464.618	85	476.749	76	553.512	81	531.4417	71	550.0777	98	473.708	106	521.486
Quarterly Totals (kWh)		**346.346**						**1431.743**						**1635.031434**						**1600.627**			
Quarterly # Events		**72**						**250**						**228**						**329**			
Public																							
MSU - Kellogg Center Ramp	Eaton	6	82.05	12	96.75	9	85.13	6	72.13	9	74.76	9	74.76	6	69.56	6	69.56	6	69.56	6	25.07	6	25.07
Impression 5	Leviton	7	28.691	9	67.731	3	19.599	15	142.99	15	134.472	17	92.431	15	108.654	18	144.241	19	87.435	6	25.07	6	25.07
Delta Township 4- West Admin	Leviton	9	12.107	6	21.088	3	14.145	9	59.961	1	5.549	3	15.763	6	36.417	10	15.934	15	24.668	3	3.842	8	25.257
LCC - Lot A (7599)	Eaton	3	24.37	4	27.14	0	0	0				9	74.76	6	69.56	6	69.56	6	69.56	6	25.07	6	25.07
LCC - Lot A (7600)	Eaton	0	0	0	0	0	0	0						0		1		1					
LCC - West Campus	Eaton	3	24.37	4	27.14	0	0	0				9	74.76	6	69.56	6	69.56	6	69.56	6	25.07	6	25.07
LCC - West Campus	Eaton	0	0	0	0	0	0	0						0		1		1					
East Lansing Library	Eaton	7	18.01	4	15.16	0	0	0				9	74.76	6	69.56	6	69.56	6	69.56	6	25.07	6	25.07
Big Boy	Eaton	0	0	0	0	0	0	9	74.76	9	74.76	9	74.76	6	69.56	6	69.56	6	69.56				
Michigan Historical Center	Eaton																	1	4.409	1	3.628	3	6.179
St. of Michigan - Allegan Lot	Eaton																			0	0	1	8.67
City Market	Eaton																			6	25.07	6	25.07
City Market	Eaton																			6	25.07	6	25.07
Delta Township - Library	Blink											9	74.76	6	69.56	6	69.56	6	69.56	5	8.421	5	19.774
North Grand Ramp	Eaton																						
Lansing Mall	GE																			25	151.1	25	151.1
Peoples Church	Leviton																			13	72.885	25	97.703
Totals		35	189.598	39	255.009	15	118.874	39	349.841	34	289.541	74	556.754	57	562.431	66	577.535	73	533.872	89	415.366	109	484.173
Quarterly Totals (kWh)		**563.481**						**1196.136**						**1673.838**						**1329.783**			
Quarterly # Events		**89**						**147**						**196**						**290**			
Fleet																							
BWL Fleet - Cust Serv	Leviton	15	99.572	36	306.202	21	191.071	23	219.572	31	289.301	41	330.508	53	280.918	50	268.364	46	234.398	49	277.363	29	124.969
Delta Township 1 - Util Fleet	Blink	81	304.128	66	282.248	0	0	22	198.64	22	198.64	22	198.64	56	194.86	56	194.86	56	194.86	40	185.82	36	151.769
Delta Township 2 - Admin East	Blink	41	150.283	32	105.301	0	0	22	198.64	22	198.64	22	198.64	26	148.53	26	148.53	26	148.53	33.5	158.64	33.5	158.64
Delta Township 3 - Garage	Blink	0	0	0	0	0	0																
BWL Fleet - Metering	Leviton	6	122.757	3	7.618	0	0	0	0	0	0	0	0	1	1.631	0	0	0	0				
BWL Fleet - CP&D	Schneider							22	198.64	22	198.64	22	198.64	50	261.23	50	261.23	50	261.23				
City Hall, Lansing	Coulomb			2	21.374	2	18.557	11	94.681	0	0	6	59.129	2	1.213	4	22.645	9	80.101	33.5	158.64	33.5	158.64
City Lansing, Garage	Coulomb	2	0.02	0	0	0	0	0	0	0	0	0	0	0	0	2	7.867	0	0	33.5	158.64	33.5	158.64
REO - back lot	GE																			12.25	33.35	12.25	33.35
REO - back lot	GE																			12.25	33.35	12.25	33.35
REO - back lot	GE																			12.25	33.35	12.25	33.35
REO - visitor lot	GE																			12.25	33.35	12.25	33.35
Totals		145	676.76	139	722.743	23	209.628	100	910.173	97	885.221	113	985.557	188	888.382	188	903.496	187	919.119	238.5	1072.503	214.5	886.058
Quarterly Totals (kWh)		**1609.131**						**2780.951**						**2710.997**						**2779.805**			
Quarterly # Events		**307**						**310**						**563**						**649.5**			

:averages were used (

Customer		Sept		Total # Events	Total kWh Year
		# Events	total kWh		
Work (Private non-residential)				0	0
Poli - Work	Clipper				
Lark - Work	Leviton	37	214.746	122	601.355
BWL - Work Garage	Eaton				
Lee - Work (MMA)	Blink	5	14.846	253	1083.431
McQuaid - Work (Faith Catholic)	Blink	14	69.59	317	1414.979
MI Laborers District Counsel	Blink	13	78.08	177	1388.228
S. Grand Ramp	Leviton	20	45.714	199	838.6312
Michigan Retailers Association	Eaton	14	69.59	111	774.27
State of Michigan - Pine St	Eaton	8	43.277	21	114.82
East Lansing, City Hall	Eaton	14	69.59	42	208.77
Totals		125	605.433	1242	6424.485

Quarterly Totals (kWh)		6424.485
Quarterly # Events	1242	

Public					
MSU - Kellogg Center Ramp	Eaton	6	25.07	113	983.8
Impression 5	Leviton	6	25.07	179	1048.869
Delta Township 4- West Admin	Leviton	13	58.034	122	357.958
LCC - Lot A (7599)	Eaton	6	25.07	53	410.27
LCC - Lot A (7600)	Eaton			3	1.03
LCC - West Campus	Eaton	6	25.07	53	410.27
LCC - West Campus	Eaton			3	1.03
East Lansing Library	Eaton	6	25.07	57	393.58
Big Boy	Eaton			45	432.96
Michigan Historical Center	Eaton	2	16.065	7	30.281
St. of Michigan - Allegan Lot	Eaton	3	4.663	4	13.333
City Market	Eaton	6	25.07	18	75.21
City Market	Eaton	6	25.07	18	75.21
Delta Township - Library	Blink	1	0.728	38	312.363
North Grand Ramp	Eaton			0	0
Lansing Mall	GE	25	151.1	75	453.3
Peoples Church	Leviton	6	24.164	44	194.752
Totals		92	430.244	832	5194.216

Quarterly Totals (kWh)		5194.216
Quarterly # Events	832	

Fleet					
BWL Fleet - Cust Serv	Leviton	9	43.13	492	3318.537
Delta Township 1 - Util Fleet	Blink	38	168.794	898	4065.682
Delta Township 2 - Admin East	Blink	33.5	158.64	458	3101.75
Delta Township 3 - Garage	Blink			1	10.54
BWL Fleet - Metering	Leviton			98	2017.23
BWL Fleet - CP&D	Schneider			216	1379.61
City Hall, Lansing	Coulomb	33.5	158.64	103	773.62
City Lansing, Garage	Coulomb	33.5	158.64	71	483.807
REO - back lot	GE	12.25	33.35	24.5	100.05
REO - back lot	GE	12.25	33.35	24.5	100.05
REO - back lot	GE	12.25	33.35	24.5	100.05
REO - visitor lot	GE	12.25	33.35	24.5	100.05
Totals		196.5	821.244	2649.5	15550.98

Quarterly Totals (kWh)		15550.98
Quarterly # Events	2649.5	

not all locations were included)

BWL Solar Carport and Electric Vehicle Charging Stations

18-Sep-13

Bidirectonal utility meter data
Total kWh = 5421.85 Negative kWh = 2715.42 Cumulative kW = 52.81

Inverter PV240US
Total kWh = 2999 Max kW = 6.77 Realtime output = 1427 watts with 2 Volts using charging stations; 1920 watts with 1 Volt using charging station kWh today = 378.1

Making sense of the numbers
Total kWh minus kWh sent out to the grid: 2999 - 2717.42 = 281.59 kWh used for charging electric vehicles Asumming all Chevy Volts used the charging stations and stayed charging for 1.5 hrs 16 amps X 208V X 1.5 hrs = 4.99 kWh therefore 281.59 kWh /4.99 kWh per car = 56 vehicle charges since April installation Solar Panel Rating is 5250 Watts assuming they produced for 8 hrs per day for the five months since being installed: 5mths X 30 days X 8 hrs X 5250W = 6300 kWh total Therefore the reading of 2999 kWh total does not seem out of the question when you consider reduced output due to the weather.

PEV – BWL Participant Feedback Request Survey

On September 19, 2013 we sent the following request to our PEV Participants:

> We hope your Volt and your charging station(s) are serving you well. We haven't heard much feedback, which we love to take as a positive. We are asking for you to please drop us an email letting us know of your experiences or if you have encountered any issues; this is great information to include in our reporting to the Department of Energy.
>
> Again, thank you for your participation in our program.

Below is a summary of the responses we received:

> Hi Angie!
>
> We are having no difficulties with one minor exception: the charging station at East Lansing City Hall is sometimes blocked by a gas-consuming car (it's the only spot with no parking meter). I mentioned this to Nathan Triplett and believe the city is going to put up an appropriate sign. I have also used charging stations at LCC's Saginaw Street lot, the Kellogg Center and at the City Market. I discovered that the Kellogg Center charger did not require payment (although payment is requested). I plugged in before handing over my credit card and the recharge started immediately.
>
> We have become a one-car family (on purpose) so our gas usage is up a little, but we are still averaging about 180mpg since Day One. It is more of a challenge to minimize on-peak recharges but our bill shows we're managing to do most charging off-peak.
>
> Recent trips to Washington D.C. and Grand Haven MI put a dent in our fuel economy average. We have found we get a solid 40mpg when operating on gas.
>
> Best always,
>
> Walt

> Both chargers are running great and we are loving our two Volts. My 2011 Volt lease is up in 5 months and already have thoughts on our 3rd Volt in the Spring.
>
> **Matt**

> Hi Angie,
>
> I am happy to report that my charging station at home and the one in the parking ramp are working flawlessly. I am still overjoyed with my Volt. So far I have talked at least one State Representative, Andy Schor, into buying his own. Yesterday I had a long chat with another state representative, Adam Zemke, and strongly encouraged him to buy a Volt as well.

You were not joking when you told us at the outset that we would become ambassadors for plug-in vehicles!

On a related note, I have been talking with some state legislators about the possibility of putting charging stations in the capital parking lot. We already have 2 State Representatives who drive Volts, and like I said above we may have another soon. I would love to talk to you or whomever I need to at the board of water and light about partnering to make that happen.

Thanks again. Let me know if there is anything else you would like me to do.
Todd

I have been working with Kevin Horbatt, a GM engineer, for several months now on a problem with my Volt. I have had a couple of instances of a completely dead 12 volt battery (not the main rechargeable battery) out of the blue.

He has put tracking devices on my car to try to figure out what is causing the issue. With some other people's cars, bluetooth or onstar technology glitches have drained their batteries, and they were able to fix the issues.

So far, they have not figured out what is causing the problem in my car. The devices are still on my car, and they have given me a battery pack so I can recharge the car's 12 volt battery if I ever need to.

So, it's a little unsettling that they don't know what causes the problem, but they have been good about trying to fix it.

Shannan

Hi Angie.

Regarding our charging station. We have not had any problems with our charging station. It has worked just perfectly from the time it was installed.

Cinda

Hi Angie!

We still love our Volt! Gerry has been housebound for a while, so not driving as much (somebody got worried that we weren't using any juice and came out to check!).

The charger has worked fine. One time I had to reset it, otherwise, no problems at all..

Thanks again for all your support!
Smitty

Hi Angie,
I love my Volt, but it has been parked for a month because I am running out of mileage on my lease. Now that the cooler weather is here I will be putting away my summer car and driving the Volt again.

Thank you and I apologize for my lack of feedback - -April

Angie--Our charging station at home is fine. The receptacle of the charging station is a bit sticky--we have to jiggle the part that connects to the car to get it to latch in place. Pretty minor, though. The one at the Big Boy is working well.—Paul

---

Hello Angie,

The charging station here at Faith and the one at my home are both working like a charm :) Having the charging station at work has been pivotal in increasing electric miles, and in avoiding the use of gasoline.

Thank you,

James

Angie:

The Volt is working well for us.

The story I wanted to share with you as that in Calendar year 2012 we purchased gas only two times. For a total of about 10 gallons, and we put on 9500 miles on the car in that time…

But once our exchange student got into the full swing or school and all the extracurricular activities, we have purchased a lot more gas this year.

As for the charging station, no problems of any sort to date.

Thanks for all your help in all issues.

Bob

Hi Angie,

Your email is perfectly timed as I am a little frustrated with my charging station experience but not sure how to approach it.

My charger (BLNK) malfunctions routinely now (often every day) requiring me to manually reset it (i.e. the test fault doesn't self correct and the power must be shut off at meter for 10 minutes and then turned back on for the meter to recalibrate). This is a pain because I can't leave the car plugged into the charger when I do the reset (because it just faults again). And because I can't keep the car plugged in when I reset the meter, I have often forgotten to go back into the garage to plug the vehicle back in at the end of the reset. The end result is I go to my car in the mroning and it is not charged up.

I called BLNK and they told me the warranty had expired and that because I am in Michigan and they don't have many meters here, the truck roll fee would be a couple hundred dollars plus the hourly fee $125. So it would cost me over $300 just to have them come to my home. This is frustating to me because as a first adopter, you'd think they'd want to see the kinks worked out of their charger..

Anyway, right now I just deal with the nearly manual reset and set a timer to remind myself to go outside and plug in my car after the reset time is complete.

Not a very high tech system for a Volt!

Other than that, things are great. I still love the Volt and it has been wonderful experience to lease one.

Sincerely!

Pat

-----Original Message-----
From: Angie Goodman <ame1@LBWL.COM>
To: >
Sent: Thu, Sep 19, 2013 1:04 pm
Subject: RE: PEV - BWL Participants

Thank you Pat for the information. We will be doing some follow up to see how we can resolve the charging station issues. We will see what we can do to help find a solution to the Blink problem! Also George mentioned you may be having some difficulties with your Volt; Can you please expand on that situation?

Thanks Pat!!

Angie

From: Pmpoli [mailto:pmpoli1@aol.com]
Sent: Thursday, September 19, 2013 9:55 PM
To: Angie Goodman
Subject: Re: PEV - BWL Participants

Ah, I forgot about that story.

So we took the Volt to our cabin in Canada, but forgot the charger. The car sat for 3 days (full tank of gas) and when I went to start it to return home on the third day, the car was dead and wouldn't start. We jump started it with another car, but when we disconnected the cables, the Volt died. Did this 3 times until finally we decided to leave the cables connected and let it charge longer. When we disconnected it, the Volt battery registered 4 miles. (I didn't realize the 12 volt battery was the same as the battery to run the car). But because I wasn't sure if the car would die once the battery discharged, we decided to have it towed 90 miles to a GM dealer in Sault Ste Marie Canada. It was at the dealer for a week (we had to get a rental to drive home and then back up again to get it the following week. The dealer couldn't find anything wrong.

I inquired through a GM friend whether there was any information on similar events for other Volt owner.. He did some research and discovered that early model Volts have a flaw that they

apparently can't fix which is that sometimes one of the modules will 'wake up' at night and if the car isn't plugged into a charger, it could drain the battery (presumably over multiple nights). The condition is intermittent and sporadic - they don't know why or when the module 'wakes up' and most of the time it doesn't cause a problem (unless you forget your charger on a trip).

All of the towing and rental car was covered by the warranty though...

They sure aren't publicizing that issue...

Pat