OPPORTUNITIES FOR ELECTRIC VEHICLE CHARGING ON MARYLAND'S SMALL TOWN MAIN STREETS

By

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Executive Summary

The Main Street cores of the Maryland cities and towns of **Annapolis, Bel Air, Berlin, Boonsboro, Brunswick, Cambridge, Centreville, Chestertown, Cumberland, Denton, Dundalk, Easton, Elkton, Ellicott City, Emmitsburg, Frederick, Frostburg, Hagerstown, Hancock, Havre De Grace, La Plata, Leonardtown, Middletown, North Beach, North East, Oakland, Ocean City, Princess Anne, Rock Hall, Salisbury, Snow Hill, Sykesville, Takoma Park, Taneytown, Thurmont and Westminster** would be ideal locations to install 240 V Level 2 (L2) charging, since they would offer walkable amenities for EV drivers.

Summary

Level 2 and DC Quick Charging infrastructure for electric vehicles is being installed at retail locations along major highways in Maryland. Even so, there is a largely unexploited opportunity to occupy the drivers time, and attract their purchasing dollars, by locating Level 2 charging directly on walkable small town Main Streets, which already have restaurants, shopping and scenic attractions in place.

EV's are coming

Plug-in vehicles (PEV) are coming. They are fast, fun and cheap to run. PEVs use no gasoline, or very little if they are plug-in hybrid vehicles (PHEV). PEVs also simultaneously solve several problems. In greatly reducing or eliminating gasoline usage, these vehicles save money by reducing gasoline purchases, increase national security by reducing the importation of oil, and help our air quality by reducing mobile source pollution and CO_2 emission, especially as the

electric grid gets cleaner over time (Maryland Electric Vehicle Infrastructure Council 2012). Owners of the current most common PHEV, the Chevy Volt, report effective gas mileage in the thousands of mpg (Volt Stats).

EV sales are growing

Total 2017 US sales of plug-in vehicles, including plug-in hybrids and all-electrics set a record of 199,826 and were 26% greater than their previous high in 2016. (Inside EV's 2017).

Maryland is currently on a trajectory that will likely achieve the goal of between 30,000 and 60,000 PEV's in the state by 2020. As of mid-2018 there are+ approximately 12,000 PEV's registered in Maryland, not including fleet vehicles.

Table 3 - Total Plug In Electric Vehicles by Year

Year	Low Scenario	Goal Scenario	High Scenario
2012*	500	500	500
2015	2,450	4,700	6,050
2020	30,200	60,000	78,200
2030	164,550	328,800	427,510

* Estimate of annual sales for the year based on sales through August.

Figure 1 Estimates of total number of PEV's in Maryland. (Maryland Electric Vehicle Infrastructure Council 2012)

EV efforts within Maryland

Along with 14 other states, Maryland has adopted the vehicle emission standards of the California Low Emissions Vehicle program (CALEV). CALEV sets stricter emission standards than federal emission standards for volatile organic compounds (VOC) and nitrous oxides (NOx), as well as for CO_2. (Maryland Department of the Environment) CALEV also includes a zero emissions vehicle (ZEV) mandate for auto manufacturers, which requires a certain percentage (15.4% by 2025) of cars sold to be zero emission. Automakers may satisfy their CALEV requirements by selling ZEV cars in California *or any one of the 14 CALEV states, including Maryland.* As PEV's grow in popularity, Maryland will likely see rapid introductions of new PEV models. The nine top-selling PEV's nationwide are all available at Maryland dealerships.

In addition, Maryland and seven other states (all with CALEV emission standards) signed a memorandum of understanding (MOU) which lays out several concrete action steps meant to reinforce California's drive to PEV's. Maryland will be part of a ZEV Program Implementation Task Force, which will coordinate effective and efficient implementation of the ZEV regulations, including harmonizing construction codes for charging infrastructure and metering options for PEV households. The MOU states also agreed to cooperate on universal signage, methods of payment, interoperability of charging networks, and ZEV incentive reciprocity, such as HOV lane access or preferential parking.

Clearly, Maryland is serious about PEV adoption. One aspect of what will ultimately become the construction of our state's electric vehicle infrastructure is understanding what an efficient, cost-effective and useful charging infrastructure should look like. We need to think early on in the process about desirable characteristics of locations of PEV charging.

Early on in the process is right now.

Principles on L1, L2 and L3 placement

Level 1, or L1, refers to plugging into a conventional 120V outlet. Level 2 and Level 3 (L2 and L3) refer to charging at 240V and 480V respectively with connectors designed specifically for PEV's.

Figure 2. Charging connectors for Level 1, Level 2 and Level 3.

L1 charging is most effective and useful at home and at work, where cars park several hours per day. Intermodal transfer locations (i.e. airports, rail parking garages, park-and-rides) are also good locations for L1 charging. L1 charging uses the least expensive hardware, as well.

In contrast, the highest level of charging, L3, also known as DC Quick charging, or DC Fast charging, is most effective and useful at inter-city sites along arterial highways at locations like rest areas, and retail areas or malls near interchanges. For example, the Maryland House and Chesapeake House Travel Plazas on I-95 commissioned L3 charging in the fall of 2017. Both have been in essentially daily use and aid driving from DC/Baltimore to Philadelphia in a PEV. In 2014, Maryland announced the locations of a network of DC fast chargers under the Electric

Vehicle Infrastructure Program (EVIP) of the Maryland Energy Administration (Maryland Energy Administration 2014)[1], one of which is also located at this critical node, near North East.

Maryland has also designated the corridors of I-95, I-270, I-70 from Baltimore to Hagerstown, I-70/I-68 from Hagerstown to the WV border and US-50 to Ocean City as **EV Charging Corridors** in compliance with the requirements of the Federal Highway Administration of the US Department of Transportation. These corridors will primarily be DC Fast charging corridors.

As to L3 charging equipment standards, the best option is dual ported equipment which supports both Chademo[2] and SAE Combo[3]. Examples of dual ported equipment were initially shown at the Electric Vehicle Symposium EVS26 in May 2012 (MyNissanLeaf.com 2012). The EVIP network will be dual ported. It is important also to keep in mind that DC quick charging is unavailable to the most popular plug-in hybrids, the Toyota Prius Prime and the Chevy Volt.

The intermediate level of charging that we will focus on in this paper is 240 Volt L2 charging. L2 charging is most effective and useful at places where drivers spend 1-3 hours:

- Shopping Malls
- Public parking garages
- Curb-side parallel parking
- Movie Theaters
- Grocery Stores
- Big Box Retail
- Tourist Attractions
- Sporting Venues
- Colleges, Universities, Schools
- Restaurant Districts
- Farmers Markets

There is, however, an additional often overlooked retail location that is ideal for L2 charging: **The Walkable Small Town Main Street**.

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[1] The EVIP locations can be viewed at **http://energy.maryland.gov/Transportation/documents/EVIPWebsiteResults2.pdf**

[2] The proper name of the standard is CHAdeMO, but I use the term with simplified capitalization.

[3] This term is commonly used to refer to the DC Fast charging portion of the SAE J1772 charging standard.

Looking for locations for L2 charging? Don't forget Main Street

The shopping mall on the interstate, or the bypass around town will install L2 or L3 charging eventually, with or without incentives, especially as the number of plug-in cars increases and the retail opportunities of attracting drivers becomes apparent. **But, let's not forget Main Street!** Many towns in Maryland still have interesting, vibrant Main Streets full of eateries, shopping, and historical attractions. Main Street is an ideal location for few-hour charging, and can be easily adapted to support it with not much effort, consisting mostly of a well-chosen location, a few EVSEs and some thoughtful signage.

What do drivers need? *To get out and walk around*.

What are plug-in car drivers looking for in a charging site? What would lead someone to pick one charging destination over another?

To answer this question, we need to understand how fast EV's charge. A Level 1 wall outlet (L1) adds 4-5 miles per hour of charging. A Level 2 charger (L2) adds about 25-30 miles per hour of charging. EV drivers thus prefer L2 over L1, and are comfortable charging at L2 for 1-2 hours.

Putting L2 charging on Main Street is a good fit *due to the nature of the charging experience*. Ask yourself, "I have to park for a couple of hours while my car L2 charges. What can I do while I'm waiting?" If the L2 location is not wisely chosen, of which I have seen many, sitting off by itself on the edge of a parking lot, not close to anything, one sits in the car with a smart phone, listening to the radio, reading, etc. Usually the first time spent at one of these remote locations is the last. Based on my experience talking to other PEV drivers, most would much rather leave their cars and walk around, get something to eat, go to a favorite location they've been to before, or a new location they've never seen, look in some shop windows, pick up some things they need, etc. They accept that they are "pinned down", and therefore are willing to leave their cars and explore around. Yes, you can also eat and walk around a shopping mall; however, most malls are bland and uniform. The variety that a town Main Street offers is exactly what makes it an attractive walkable destination.

Fortunately, there is a group of town Main Streets that the State of Maryland has already selected to be the focus of just the sort of short term visitor/tourist activity that L2 charging would facilitate.

Main Street Maryland

The Main Street Maryland (MSM) program was created in 1998 by the Maryland Department of Housing and Community Development (DHCD). It has identified 26 Maryland towns that "have exhibited a commitment to fostering economic revitalization and sustainability in their downtown districts. Designations are earned through a competitive

process that highlights a five-point approach that incorporates design, local organization, promotion, economic development, and sustainability." (Main Street Maryland) Given the well-known synergy between electric vehicles and sustainability, and the tourism activity derived from EV travel, it would be natural to encourage and support L2 EV charging located directly on or near the targeted Main Streets.

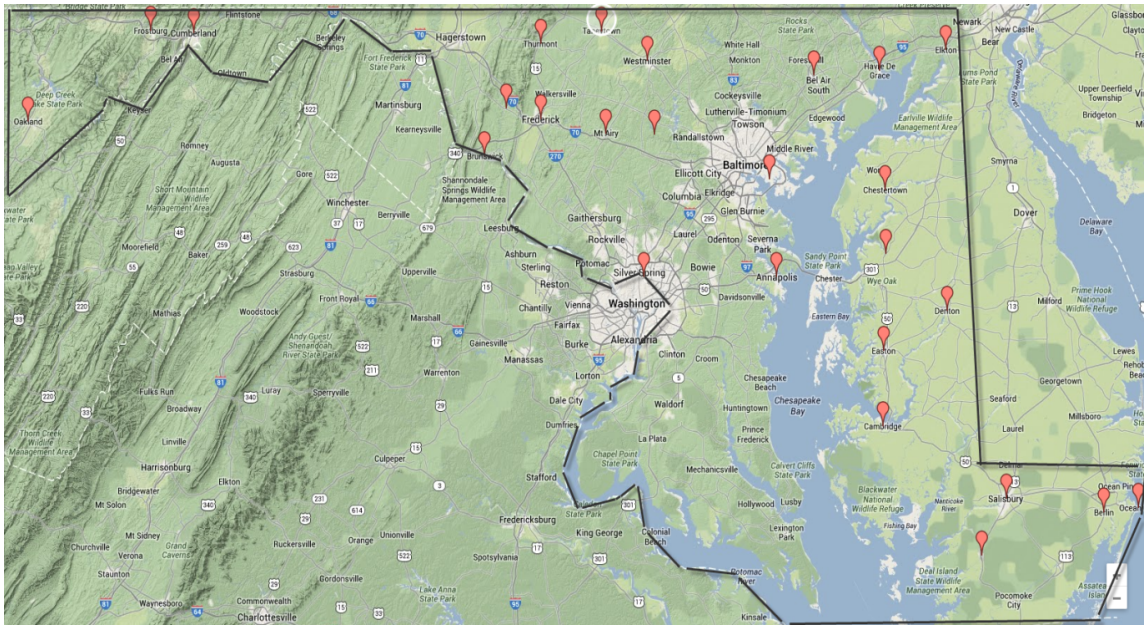


Figure 3. The 26 Towns Targeted by Main Street Maryland

Thoughts on Individual MSM Towns

In order to get a concrete picture of what L2 charging on Main Street might look like, I present my observations of the MSM town centers, based on their current support for charging as shown on a widely used crowd-sourced charger[4] locating app, PlugShare (PlugShare), Google Street View, personal visits and personal interviews with other electric car drivers.

<u>Annapolis</u>: The most convenient charging for Main St. pedestrians currently is Knighton Parking garage on West Street with two EVSE's and walking or trolley access to Main Street. One or two dedicated L2 spaces on or near Dock Street would be useful, but likely to be ICE'd, unless enforced.

<u>Bel Air</u>: Municipal parking garage has EV driver-discovered 120V outlets. Would make a good choice for L2 charging one block from vibrant Main St. Closest L2 charging is currently about ½ mile away.

[4] The term "L2 charger" has come to be used interchangeably with the technically correct term L2 EVSE (Electric Vehicle Supply Equipment). An L3 unit is indeed actually a charger.

Berlin: EXCELLENT CANDIDATE. Currently unsupported, and charging would draw people driving to/from OC. Might be part of southern Maryland EV Day Trip (see Princess Anne).

Brunswick: Completely unsupported now. Scenic, walkable destination.

Cambridge: Excellent candidate. Put L2 right in the retail heart, which would be a good compliment to DC quick charging along US-50 (which is unavailable to the Chevy Volt). **UPDATE: Free Tesla destination and L2 chargers have recently been installed in retail center. Users already reporting charging while having lunch and shopping.**

Centreville: Unsupported now. Very scenic, charming town. Could become part of Upper Bay EV circuit.

Chestertown: Unsupported, very walkable and attractive on High Street. Together with Centreville, this could become part of an EV day trip circuit around the Upper Bay.

Cumberland: Together with Frostburg, a fabulous candidate, since L2 would be useful for visitors to the Western Maryland Scenic Railroad, and other downtown businesses and would provide good compliment to future DC Fast charging.

Denton: Great candidate to become a waystation on the way to/from Ocean City or Rehoboth Beach, DE. Currently unsupported.

Dundalk: Unsupported. Good candidate to draw new people. Nice walkable core near Dundalk Ave and Center Place.

Easton: Ideal candidate. It's already becoming a sort of EV waystation to/from Ocean City. I personally know of PEV drivers who have had to stay overnight in order to charge at L1, since the single L2 station at the Toyota dealer in town was unavailable.

Elkton: Fabulous candidate on its own, and as part of the EV day trip circuit around the Upper Bay. Scenic respite from I-95. **UPDATE: Installed L2 charging in good spot at the beginning of 2017.** See https://api.plugshare.com/view/location/102528 .

Frederick: Has outlying L2 charging, but needs it directly on Main Street. Could support multiple L2 locations. Good example of the principle of attracting EV drivers off the interstate to downtown.

Frostburg: Unsupported, would be good complement/backup/alternative to Cumberland. Scenic and walkable.

Havre de Grace: **UPDATE: Has installed L2 charging, within easy walking distance of downtown**. See https://api.plugshare.com/view/location/110413 . Could become anchor for an EV day trip around the Upper Bay.

Middletown: Unsupported with excellent location. Would draw people off I-70, and travelers to/from Antietam Battlefield via Boonsboro.

Mount Airy: Gorgeous Main Street. Would pull traffic off of I-70 and become a destination itself. Good backup/complement to Frederick. **UPDATE: Mt. Airy dedicated a dual L2 charger 5/11/2015 at a municipal parking lot in the heart of town. Since dedication, at least 40 unique users have checked in at least once on PlugShare, some several times. See a detailed description at PlugInSites** (Hartman 2015) **and https://api.plugshare.com/view/location/64390 .**

Oakland: Completely unsupported, and would become both a destination, and part of a day trip including visits to local windfarms in MD and WV. Windfarm tourism is also a burgeoning activity (Foster 2013).

Ocean City: Has seen recent rapid growth in L1 charging at hotels, L2 charging along Coastal Hwy and L3 charging. Future L2 needs to be evenly distributed.

Princess Anne: Thoughtful placement along Somerset Ave. would attract EV drivers off of Ocean Highway to spend time in this wonderful town. Could become part of a southern MD EV day trip route including Pokomoke City, Snow Hill, Berlin and Salisbury, all of which have Main Street cores.

Salisbury: Currently supported by outlying L2 charging, but unsupported on Main Street, in the central area of East Main and West Market. L2 would complement DC quick charging along US 13. Note that US 13 Ocean Hwy is less walkable, so L2 charging would be better located at specific eateries.

Sykesville: Nice walkable Main Street core ideally suited for L2, and abundant parking. Would draw people off of MD 32. Currently unsupported.

Takoma Park: Recent installation of L2 near an attractive walkable retail core along Carroll Ave. More would likely find receptive local support.

Taneytown: Beautiful walkable Main Street that would become a scenic EV destination, and support travel to/from Gettysburg, PA

Thurmont: Currently unsupported. Would draw people off of US 15, and support through-travel to Gettysburg, PA, and possibly be a part of solar tourism for people visiting the solar array at Mt. Saint Mary's University near Emmitsburg.

Westminster: Current supported by outlying L2 charging, but unsupported on Main Street. Could support 2 locations along the long Main Street corridor.

Additional nominations of towns not currently part of Main Street Maryland, but which would provide nice, walkable environment for L2 charging:

Ellicott City, Hancock, Hagerstown, Emmitsburg, Rock Hall, Leonardtown, La Plata, Boonsboro, North East, North Beach, Snow Hill, others…

Existing Successful L2 Charging Locations

To understand what is possible, it helps to see some successful examples. We begin our Main Street charging tour at the L2 charger in St. Michaels, on Maryland's scenic Eastern Shore, which I first visited in the fall of 2014, soon after its installation. This is a dual-port Chargepoint charger located in an off street parking lot one block away from South Talbot Street, which is the central dining/shopping focus of the town. It is also an easy walk to the Chesapeake Bay Maritime Museum. Several drivers on Plugshare have complemented its location and proximity to restaurants and shopping.[5]

[5] See St. Michaels Public Parking at http://api.plugshare.com/view/location/55943

Figure 4. L2 Charger one block from S. Talbot Street, St. Michaels.

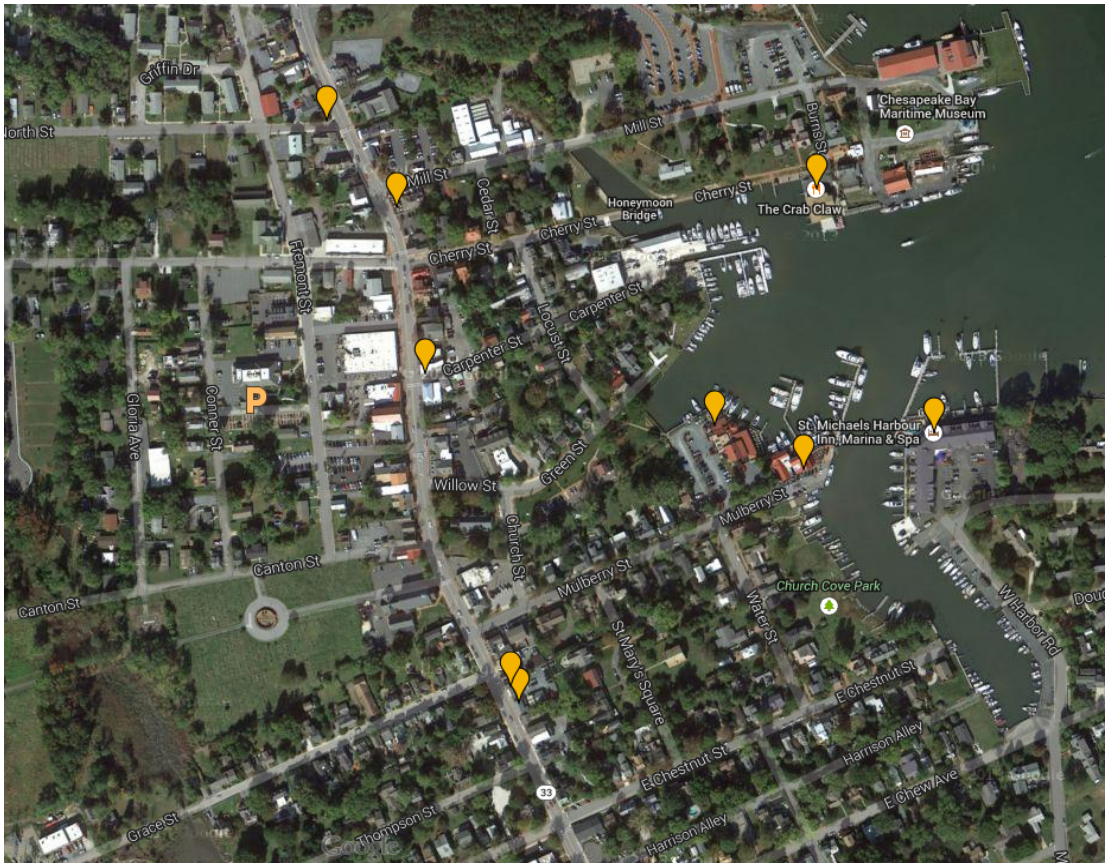


Figure 5. St. Michaels. Orange markers are restaurants. The charger is at P.

The recently installed Level 2 chargers in Cambridge[6] are in an ideal location, next to Black Water Bakery on Race St., allowing easy access to numerous dining choices. User comments:

"Charging at 23 mi/hr while having lunch at Stoked Wood Fired Eatery." - Vera

Figure 6 Black Water Bakery, Cambridge.

Another example is the charger site of the Harrisonburg Electric Commission in Harrisonburg, Virginia. This is a publically accessible L2 charger centrally located in downtown Harrisonburg, adjacent to a farmers market and within a few blocks of restaurants, shopping and historical sites.

[6] See Black Water Bakery at https://www.plugshare.com/location/160756 .

Figure 7. L2 chargers near farmers market of Harrisonburg, Virginia.

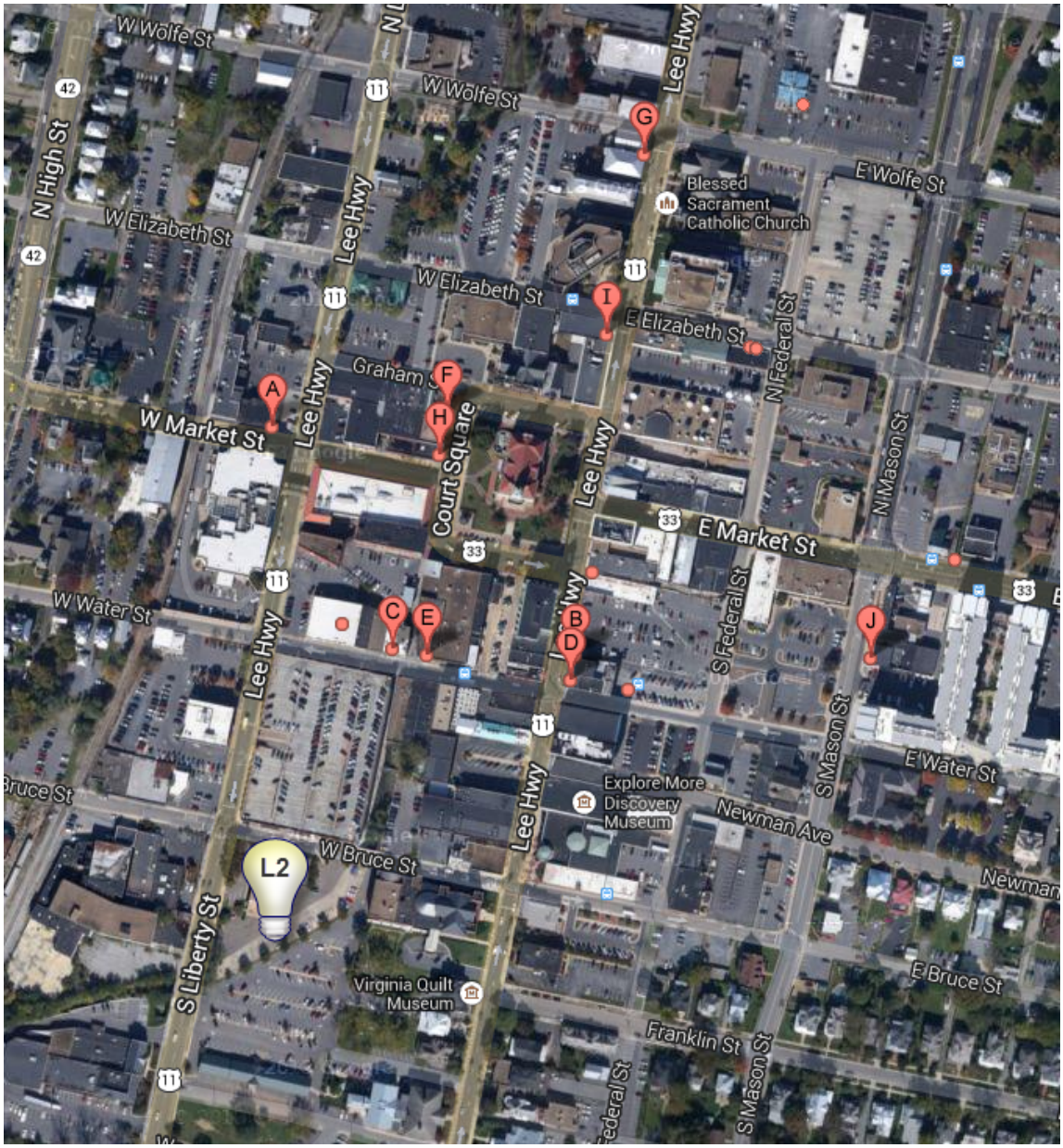


Figure 8. Central Harrisonburg, Virginia. Light bulb is location of L2 chargers, red markers are restaurants.

To quote the Plugshare comments[7] of two patrons:

> *"Charging at 30A, 240V, 7kW, 21mi/hr. It's an Eaton charger. I ran into (not over) an employee who saw me drive in and knew what I was here for. Very nice man. Directed me to the end of the lot near an exit/entrance and where the bay doors are. I thought he said 2 chargers but must have said 2 spots. I see only 1 nozzle. It's free! Having a meal and hanging in downtown before heading*

[7] Harrisonburg, VA: http://api.plugshare.com/view/location/6744

on my journey. Thanks HEC! Really making my trip easier/more pleasurable. Will post pics later." - Sakamoto

"Free. My model S charged at 17 miles per hour. Convenient to great downtown shops, restaurants and bars" - Larry

There are other examples from around the country of wisely chosen and well-used L2 charging near Main Street:

The Taylor Street Garage, 100 Taylor Street, Columbia, South Carolina[8]: *"This garage is right around the corner from Main Street where the Soda City market is held on Saturday mornings. Parking is free on the weekend, park and charge while you shop in the market." – andy*

Figure 9. 2 minute walk to Main Street from Taylor Street Garage, Columbia, South Carolina.

HARP Pueblo River Walk, 105 S. Victoria, Pueblo, Colorado[9]:

"Very good spot close to visitor info, and Downtown. Busy place." – S.P.

"Lovely river walk location. Had great sushi during charging. Pizza and Mexican available within a block or so as well. Many amenities in walking distance" - Tessy

[8] Taylor St. Garage: http://api.plugshare.com/view/location/1551

[9] HARP: http://api.plugshare.com/view/location/15732

Figure 10. HARP Pueblo River Walk, Pueblo, Colorado.

Ellensburg Chargers #1-#4, Corner of W 3rd Ave and Main St., Ellensburg, Washington[10]: *"Good location - off hwy 90 then off main and 3rd. Lots of restaurants within walking distance. Cost at 220 is $ 0.75 per hour." – PlugShare patron*

"Used HPC with our own adapter. Another great late lunch at Yellow Church Café." – Vincent

Figure 11. Ellensburg, Washington

[10] Ellensburg: http://api.plugshare.com/view/location/5243

2nd and Main St. (Oregon Coast Highway), Tillamook, Oregon[11]: *"I normally use AV at Fred Meyer but it was a nice day for a walk while the car charged. Thanks OP" – Joe M*

Figure 12. Tillamook, Oregon

Fisherman's Market Square, 4 C St., Eureka, California[12]: *"My account tells me it is actually charging $1.00 per hour (less .25 for loyalty discount). We have charged at this station twice successfully in the last month. Good spot from which to explore Eureka's Old Town neighborhood." – PlugShare patron*

[11] Tillamook: http://api.plugshare.com/view/location/11824

[12] Eureka: http://api.plugshare.com/view/location/4231

Figure 13. View from Fisherman's Market Square, Eureka, California.

What these sites have in common

What links all of these locations is available L2 charging and something to do while charging. Note also that, in some cases, plug-in drivers are willing to pay fees to charge. However, it is wise not to expect to make money from charging fees directly. Rather, ***money is to be made by occupying the driver's time*****.** Locations that are able to attract drivers and provide services while the drivers are waiting will likely generate far more income than can be had purely from charging fees. "Town Ownership" of the charger, perhaps from the pooled contributions of merchants, would therefore be an appropriate financing mechanism, rather than relying on an individual merchant to pay for its installation.

Maryland also has grant money available to assist in the purchase and installation of electric vehicle charging stations, via the Maryland Energy Administration's Electric Vehicle Supply Equipment Rebate Program (Maryland Energy Administration)**. Towns can apply for a 50% rebate on purchase and installation of charging equipment up to $5000 per EVSE.**

This could turn in to a rebirth of EV tourism

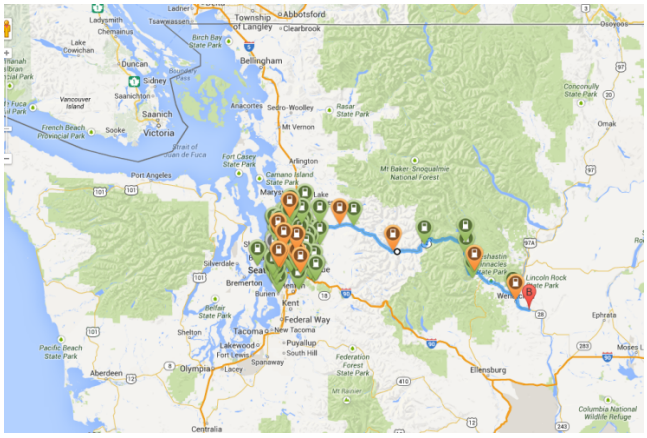
In 1914, the New York Electric Vehicle Association published a guidebook entitled "*Electric Touring: Presenting A Number of Electric Automobile Tours in New York, New Jersey and Connecticut*", which laid out seven day trips for electric vehicles departing and returning to New York City (Electric Touring). The longest was to Poughkeepsie, New York, a distance of 83 miles. Drivers were instructed on all the routes to charge their cars at local electric company central stations, electric car dealers, garages and, on the route to Lakewood, New Jersey, a dairy.

Now, we are in the early days of a rebirth in just such electric tourism. Since a day trip consists of driving segments linked by charging sessions, it provides a natural fit with destination tourism. Other states are acting to harness this new and exciting activity.

EV Tourism Efforts in Other States

The University of Delaware and Delaware Department of Natural Resources and Environmental Control have announced plans to install L2 charging at sites selected to "make it easier for drivers of electric cars both from Delaware and surrounding states to patronize Delaware tourist destinations – from nightlife on the Riverfront to popular shopping districts to our beaches." The partnership will specifically consider "locations where drivers can spend time dining, shopping or enjoying the outdoors." (Delaware)

The Wenatchee Valley of north central Washington lays claim to being the first "EV Tourism Corridor" (Rodriguez). The corridor consists of L3 and L2 chargers, located at hotels, restaurants and a ski area. Founder Ron Johnston-Rodriguez laid out a hypothetical EV road trip in a TEDx talk in 2013 (YouTube 2013).



The website of the Oregon Tourism Commission, Travel Oregon, enticingly lists five EV itineraries, complete with attractions, lodgings and convenient charging locations, located near walkable amenities. (Garvin 2013)

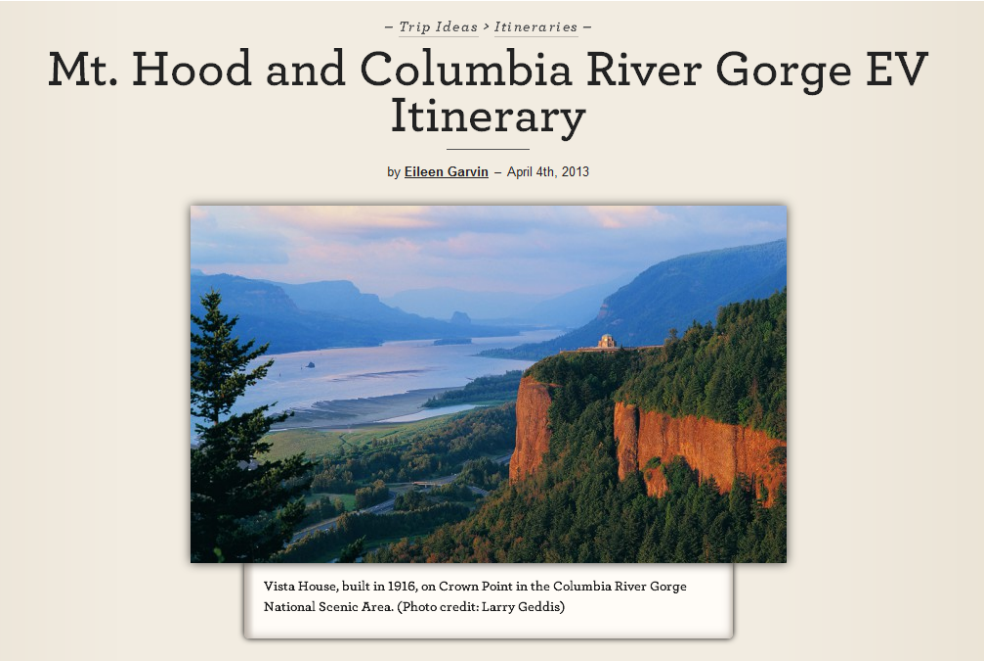


Figure 14. EV Itinerary from Travel Oregon website

Oregon recently had a full-time Chief EV Officer charged with implementing the Oregon EV Action Plan, managing the Oregon portion of the West Coast Electric Highway, and

managing the EV Tourism Initiative in partnership with Travel Oregon. (Motavalli 2013) (Ashley Horvat) (West Coast Green Highway)

Washington and Oregon have established their credentials as enthusiastic supporters of EV's and EV tourism. *With a bit of planning and care, Maryland can similarly establish a reputation for "EV Friendliness".*

EV tourism is already starting to self-organize

PEV drivers continue to expand the range of their driving, and to test the limits of their electric cars. Since the cost of electric driving typically runs about one-quarter the cost of driving with gasoline, exploring new places off the main highway becomes worth doing. Many drivers rely on smartphone apps, such as PlugShare, to see what charging is available on the way to, or at a destination. As noted above, drivers enjoy letting others know what's located around a given location. Drivers are even making *cross-state* PEV trips (Slade) (The Electric Roadtrip Across Maryland). **Slade had specific, detailed recommendations for placing L2 charging in Oakland, Cumberland, Hancock, and the Eastern Shore.**

Action Items

- Demonstrate this nascent opportunity to MSM towns through good working examples. Focus efforts through the existing MSM program, and consider including PEV charging in the competitive process to earn the MSM designation. It's probably best to survey town retail associations, Chambers of Commerce, mayors, etc., to get ideas for the best placement of L2 chargers. For many, this will be the first placement of an L2 charger, *so they have to see some good working examples of what other towns are doing, and give it careful thought.* Consider posting attractive signage/maps identifying locations of restrooms, restaurants, shopping, etc. for visiting drivers, ***who will want to be pedestrians during their visit.***

- Also demonstrate the opportunity to the Maryland Tourism Council by pointing out what Washington and Oregon are doing. Maryland can establish EV tourism corridors, routes and loops that would be easy to promote. Maryland should also install L2 charging at historical or other destination tourist sites, including State Parks, within its purview, similar to efforts in California by the nonprofit organization Adopt a Charger (Adopt-a-Charger 2015). It begins with establishing centrally located L2 locations on MSM or MSM-like Main Streets.

- Reach out to town mayors and explain the economic opportunity available to draw electric vehicle drivers directly to their Main Street cores. Contact information is given in an appendix.

Conclusion

We are still in the early days of PEV infrastructure in Maryland, which affords us the opportunity to build the kind of charging network we want. In some parts of the state, electric touring remains an adventure. It's time to start filling in the gaps by thoughtfully including charging on the Main Streets of Maryland towns.

Appendix

This is the contact information for the elected officials of the candidate towns listed in this study as of January 2017.

Annapolis	Mayor Mike Pantelides	Mayor@annapolis.gov	410-263-7997
Bel Air	Chair Susan Burdette	sburdette@belairmd.org	410-638-4550
Berlin	Mayor Wm. Gee Williams	mayor@berlinmd.gov	410-641-2770
Boonsboro	Mayor Howard W. Long	MayorTOB@gmail.com	301-432-5141
Brunswick	Mayor Jeffrey T. Snoots	JSnoots@BrunswickMD.gov	301-834-7500
Cambridge	Mayor Victoria Jackson-Stanley	mayor@choosecambridge.com	443-205-3822
Centreville	Town Manager Steve Walls	swalls@townofcentreville.org	410-758-1180
Chestertown	Mayor Chris Cerino	chris.chestertown@verizon.net	410-778-0500
Cumberland	Mayor Brian Grim	briangrim@verizon.net	301-759-6414
Denton	Mayor Abigail McNinch	dentonmaryland.com	410-479-2050
Dundalk	Mayor Catherine Pugh	mayor.baltimorecity.gov	410-396-3835
Easton	Mayor Robert Willey	bobwilley@town-eastonmd.com	410-822-2525
Elkton	Mayor Robert Alt	administration@elkton.org	410-398-0970
Ellicott City	County Exec. Allan Kittleman	akittleman@howardcountymd.gov	410-313-2013

Emmitsburg 301-606-1512	Mayor Donald Briggs	mayorbriggs@emmitsburgmd.gov	
Frederick	Mayor Randy McClement	nbamonti@cityoffrederick.com	301-600-1385
Frostburg	Mayor W. Robert Flanigan	frostburgcity.com	301-689-6000
Hagerstown	Mayor Robert Bruchey	mayor@hagerstownmd.org	301-766-4175
Hancock	Mayor Daniel Murphy	mayor@townofhancock.org	301-331-7098
Havre de Grace	Mayor William Martin	billm@havredegracemd.com	410-939-1800
La Plata	Town Manager Daniel Mears	dmears@townoflaplata.org	301-934-8421
Leonardtown 301-475-9791	Mayor Daniel Burris	Leonardtown.Commissioners@verizon.net	
Middletown	Burgess John D. Miller	burgess@ci.middletown.md.us	301-371-6171
North Beach	Mayor Mark Frazer	www.northbeachmd.org	301-855-6681
North East	Mayor Robert McKnight	office@northeastmd.org	410-287-5801
Oakland	Mayor Margaret Jamison	townofoak@gmail.com	301-334-2691
Ocean City	Mayor Richard Meehan	oceancitymd.gov	410-289-8221
Princess Anne	Town Manager Deborah Hrusko	townofprincessanne.org	410-651-1818
Rock Hall	Mayor Brian Jones	brjones@rockhallmd.gov	410-639-7611
Salisbury	Mayor Jacob Day	jday@ci.salisbury.md.us	410-548-3100
Snow Hill	Mayor Charlie Dorman	snowhillmd.com	410-632-2080
Sykesville	Mayor Ian Shaw	IShaw@sykesville.net	410-795-8959
Takoma Park	Mayor Kate Stewart	KateS@takomaparkmd.gov	240-338-9333
Taneytown	Mayor James McCarron	jlmccarron@taneytown.org	410-751-1100
Thurmont	Mayor John Kinnaird	jkinnaird@thurmont.com	301-606-9458
Westminster	Mayor Kevin Utz	mayorutz@westgov.com	410-848-9000

About the Author

Scott Wilson works at a patent examiner in the US Patent and Trademark Office. From December 2011, he put 34,000 miles on a 2012 Nissan Leaf, and 36,000 miles on a 2014 Nissan Leaf. He currently drives a 2016 Kia Soul EV and 2011 Think City.

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Figure 15. Opening of Mt. Airy Main Street charging. This can be replicated for many small towns.