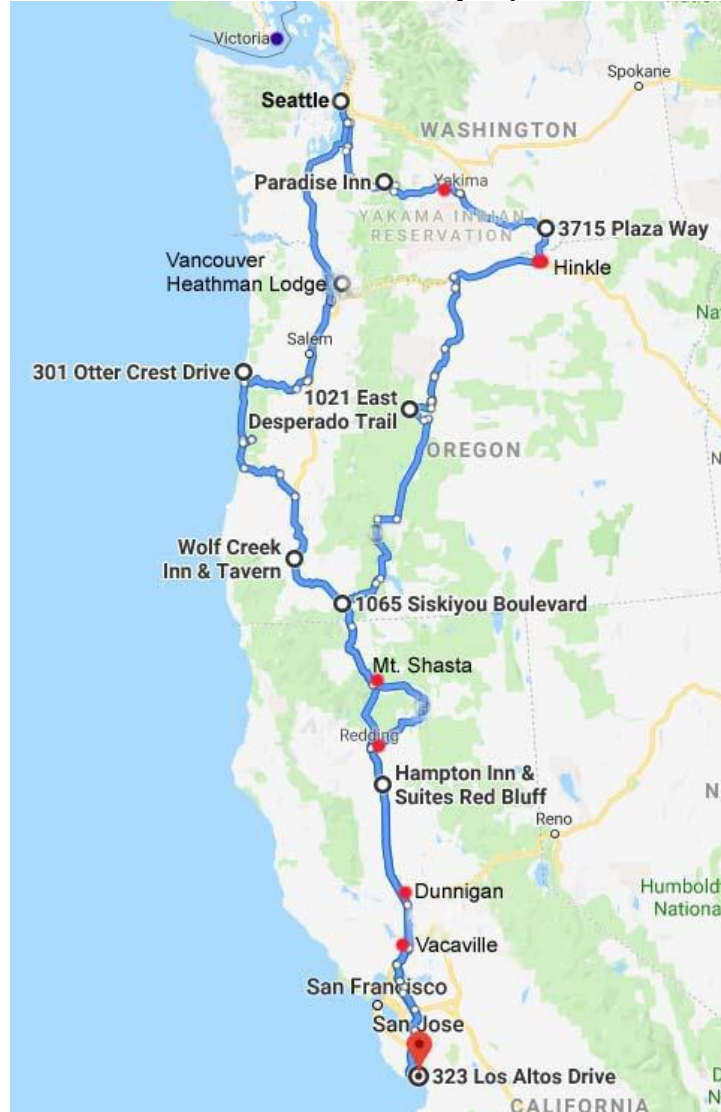


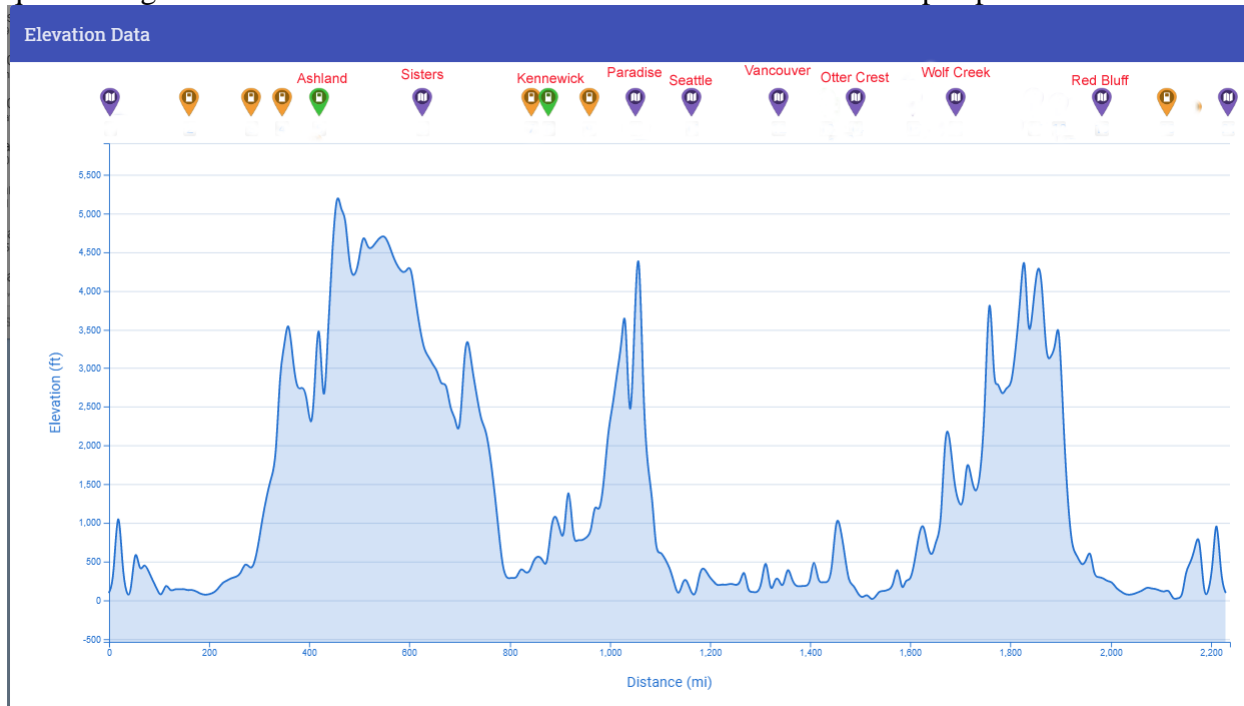
Road Trip from Santa Cruz, California to Seattle Washington in a Bolt EV August 15th to September 2nd, 2019

Summary:

The initial motivation for this trip was a long overdue visit with good friends in Seattle. However, we can't resist packing in loads of interesting things to do along the way. The basic plan was, first, get into Oregon quickly. So August 15th we drove from Aptos to our first stop, Ashland, OR, where we spent two days. Next stop was Sisters, OR for the Oregon "free fishing" days. Then on to Kennewick, WA to visit a woman we know who breeds Korat cats. After this we headed up to Mt Rainer for a two day stay in Paradise (oh yeah!). Then on to Seattle for a four day celebration with our friends. We left the car in Seattle and took a float plane up to Victoria BC, where we spent two nights on a house boat. On August 28 we flew back to Seattle, picked up our car, and drove south, staying one night in Vancouver, WA. The next day we headed west to the Oregon coast, staying two days at an Inn overlooking Otter Rock, then Wolf Creek Inn for a one-night. We made a sweep east toward McArthur-Burney and Lassen parks before stopping in Red Bluff, CA. This made for an easy trip home the next day (September 2nd).



White circles on the map are day destinations (hotels), red dots are charging stops and blue dot non car stay in Victoria BC. The out of pocket fuel cost for 2400 miles was \$80 at the combined quick charge stations. I included an elevation chart of the route for that perspective.



Special thanks for Al LePage of the Eugene, OR Emerald Valley EVA chapter of the EAA for creating a press release in hopes that one of the papers would pick up the story of the trip and help educate the public about electric vehicles for long range trips. Madeline Shannon, a reporter for the Newport News Times did an interview me and Michelle.

First Day

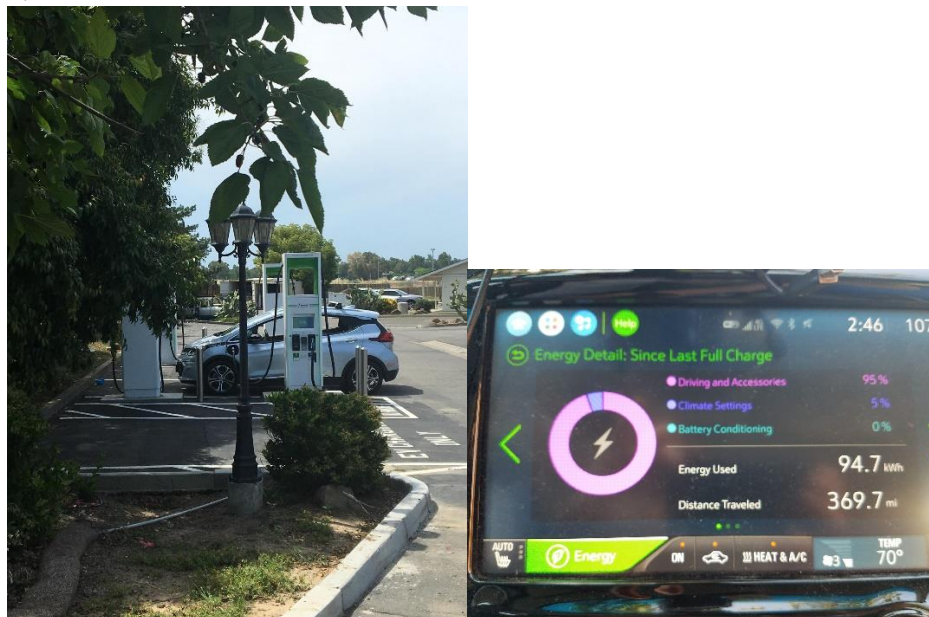
We got the car packed including all the extra charging options and snacks for the road.



Took the first of many power level pictures, showing the total miles on the Bolt at the start. Note that I did not complete the charge so the display did not reset to zero. On the trip to Ashland, these numbers should be subtracted (19.4KW and 89.2 miles)

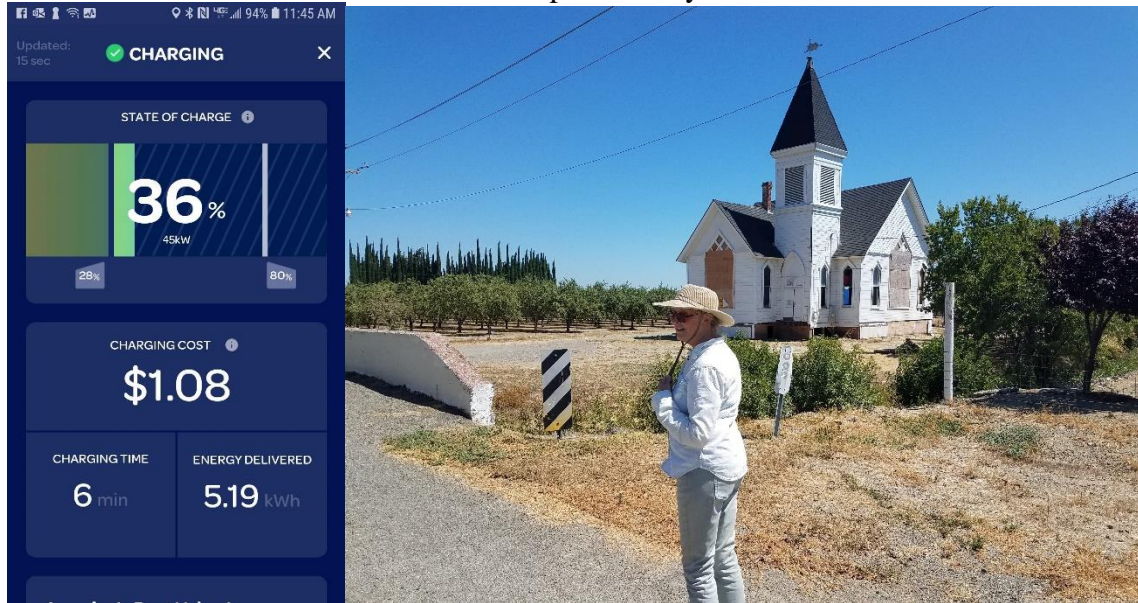


The plan for the first day, is to get the battery below 50% or lower so the quick charger will be quick. Better to stop twice than to try and fully charge, so that is what we did. First stop (marked with a red dot on the map) is Dunnigan, CA. This is a large, updated Motel 6, consisting of several one-story buildings. Each roof supports a large solar array. This is more solar than I have ever seen on a motel before. There are four quick charge stations and although they are 125KW, the Bolt EV tops out at 50KW. This was my first use of Electrify American charging stations. I had installed the application on my phone because many reviews said charge cards did not work. In fact, the application did accept payments and worked well once I figured out that I need to start by interacting with the map on my phone, rather than the button selection on the station.



This brand of station has one of the best applications for status on your charge. Really easy to follow see the screen shot below. Food and shops are extremely limited so we opted just to

stretch our legs. We took a pleasant walk around this quiet farming community and saw some local historic features and the broad views of open country.



We charged to 82% and headed for the next quick charge station in Redding at the Carl's Jr. Nothing charming here, but the charging was free. Since this is only a 24KW station we had an early dinner to ensure we'd get to the Mt Shasta quick charge.





Mt Shasta was such a great station choice that we decided right away to use it on our return route as well. One of the best 'in your face' views of the mountain top, crisp clear air, and handy things nearby: a large well stocked grocery store and the Great Western across the street has a comfy air-conditioned lobby, lounge, and restaurant. This was our last charge before Ashland, and it gave us plenty of juice to get over the mountains.

Mt. Shasta, before



Mt Shasta, after



Ashland at 7:30pm, 12 hours from Aptos, CA



This was the longest leg of the trip and we didn't need to do more than one quick charge on any day after this. By far the quick charge in Dunnigan and Mt Shasta, were the best. Mt. Shasta seemed to be faster than Dunnigan but that might have been an illusion due to the slow charge in Redding.

We stayed two nights at Palm Cottages, just a one mile walk from downtown Ashland. A sweet spot with all the amenities: a ClipperCreek charging station for overnight charging; a beautiful saltwater pool for evening relaxation; and extensive garden and picnic areas between the cottages. We had an afternoon wine, cheese, and crackers while I met with the president of the local chapter and board member of EAA, James Stephens, who arrived in his red Tesla Model 3. Right next door to the 'Cottages' is an iconic Ashland eatery, Morning Glory Restaurant. I hadn't visited Ashland since my oldest daughter was working there as an assistant stage manager in the late 90's. We dined here again this time and found it still a worthwhile experience if you're in the area. Only did the (disappointing), Green Show, in Ashland, no time for plays



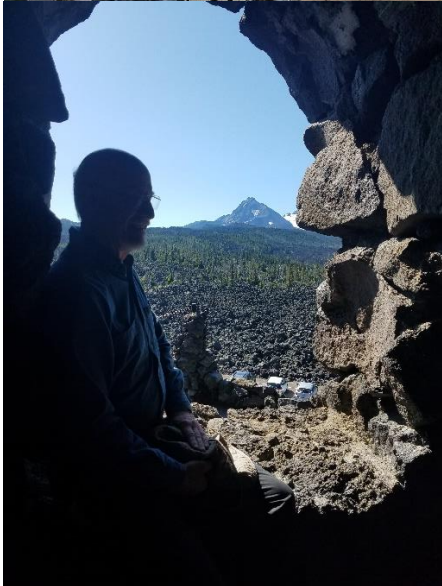


We left Ashland via the scenic (if disconcertingly named) “Dead Indian Memorial Road”. We charted our route along smaller secondary highways for the views and cut through the western portion of Crater Lake National Park. This is one of my most favorite locations in the world. We enjoyed viewpoints near the lodge, then sampled a couple short hikes as we drove along just the portion of the rim road which lies closest to Wizard Island. This route had the added advantage that no charging stops were required to reach our destination, Five Pines Lodge, in Sisters. They had two Tesla and one Bosch J1772 charging station. I was plugged in for about an hour and received a text message that charging had stopped. Turns out it was just the breaker which might have been due to the heat. It was out for about an hour before they found the electrician to reset the breaker and charging started and completed later that evening.



Sisters is a fun little town and we stayed two nights. We enjoyed walking around and had an exceptional meal at a very unusual and popular restaurant, The Open Door (get reservations!).

Our time in Sisters, coincided with two free fishing days in Oregon. We brought all the gear, visited the Wizard Falls Hatchery, and even walked part of the pathway along the gorgeous Metolius River, but ran out of time without tying on a single fly.



We spent one entire daytrip exploring the stark beauty of Hwy 242 (open only during warm part of the year) to the west of Sisters. The Dee Wright Observatory was the most interesting location. The round building is constructed completely of giant lava 'boulders' and has two stories. Inside the dark lava room there are a number of view holes, reminiscent of "arrowslits" in fortress walls. Looking outward, each one helped spot and identify one of the many peaks

surrounding the 'Observatory'. On the roof is a stunning 360 degree panorama. There are paved trails winding through the massive lava flow with rangers and exhibits signs. A lesson in both geology and early life, especially from viewpoint of the original inhabitants, who had to navigate their lives among these incessant and massive flows, living with the possibility of getting surrounded and trapped on a small island of high land.



Two day stops in the place like this make for a great morning run. Did my 3 miles in the woods.



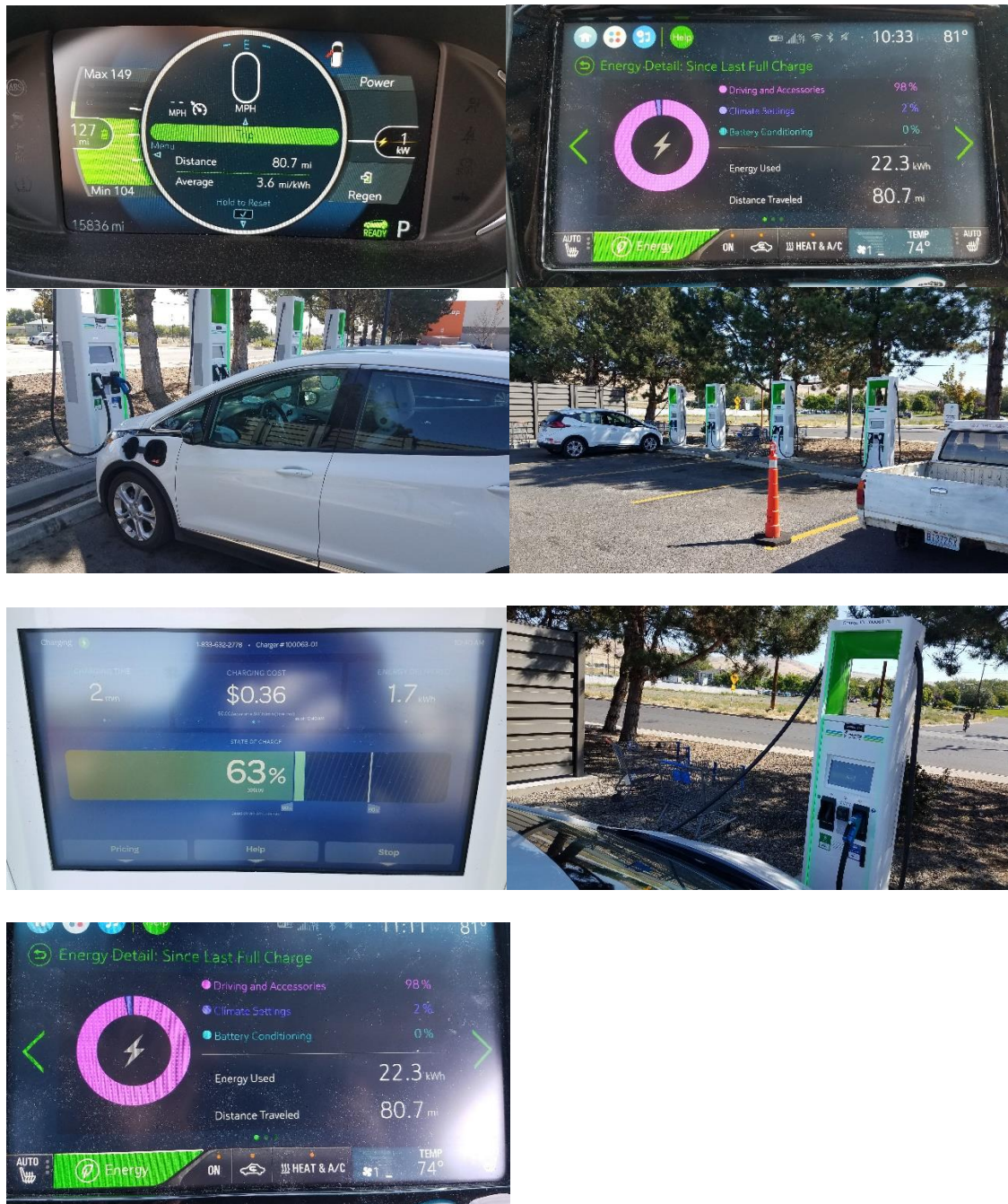
Next stop was Kennewick, WA where we had the opportunity to visit some friends and their Korats, a very unusual and ancient breed of cats from Thailand. We did a short refueling at another Electrify America, in a gas station in Hermiston, OR (Space Age Fuel). This was only

about 35 miles from our destination. As you can see, this would have been close to our max range, so it was good to stop.



We left the Hampton Inn, Richland with a full overnight charge and headed up to Mt Rainer. We'd booked (way in advance) a two-night stay at the historic Paradise Inn. Since there are no charging stations (yet), in the park, I email well in advance of the trip to try and talk them into supplying 120vac to charge my car. The day before I arrived, I receive a message that this would be acceptable to them and they would run an extension cord from the maintenance department at the hotel. Turn out it was a good thing to have this email because I received some resistance when I was checking in. They took a picture of the message off my phone and then were happy to have me park in the back of the hotel next to the maintenance department. I plugged in with my 120vac charging station for two days and almost received a full charge.

Since I wasn't really sure I would be able to do this, I had picked up a quick charge in Yakima at another Electrify America charging site. This one at a Walmart parking lot, where we also picked up some lunch. While there many gasoline power vehicles parked in electric vehicle only spaces even though the location wasn't really that close to the store. We talked to the car owners about the restriction and although they were nice enough, but they politely ignored us and didn't move their cars.



Mt Rainer was amazing! We learned it would be raining on our second day, so we set off on a hike right away (forgetting my camera/phone and hiking shoes). On the way up the Alta Vista and Skyline Loop trails. With Mount Rainier Peak looming ahead, we stopped to gasp for air, admiring glaciers and waterfalls. Near the top of our trail we caught a glimpse of Muir Base Camp. Unbelievable views lay on all sides as the trail loop continued through alpine meadows. There we got closely acquainted w/unconcerned Marmots, squealing Pikas, deer, and even a black bear!

Although there was rain on the second day, the visitor center had good food, exhibits and wifi which was not available anywhere else at the site. Later in the day it did clear up enough to make short hikes to Deadhorse Creek and Myrtle Falls.





On August 22, we easily made it to Seattle on the charge we got at Mt Rainer. (As I occasionally do on these trips, I missed getting the picture of my charge status at this location.)

Michelle is a UW alumna (go huskies!) and her university classmates are the friends we stayed with for four days. Greg and Kit Owen both artists. Greg has retired from his job with the university, continues to produce remarkably varied artwork and Kit splits her time creating a most unusual garden space and working with a UW educational research project. We did a little canoeing near the stadium. Saw the Chittenden/Ballard Locks in action, transferring all sizes of boats between saltwater of the Puget Sound and the freshwater Ship Canal. Also watched returning salmon and a fat seal picking some of them off as they made their way to the fish ladders. Then downtown to Pike Place with a chance to dine at The Pink Door (one of Michelle's eternal favorites) and up to the 40th floor of the Columbia building with a Starbucks, for a free viewing location.





Most fun was just being with Kit, Greg and their son, Kevin. He is a brewer in Redmond with a little-known microbrewery Mac and Jack's. Really yum and some truly unusual brews too! If you have time visit their tasting room in Redmond. <https://www.macandjacks.com/>



We left the Bolt with our friends and took a float plane ride up to Victoria BC. The flight took off from Lake Union right in the middle of Seattle and landed neatly in the Inner Harbor near our next two nights lodging, a houseboat B&B near Fisherman's Wharf.



The first day we walked for miles around Victoria proper. Our favorite place was Beacon Hill Park. It has lots of luscious plantings and water features, but we especially delighted in finding 'surprise' features.

There was a giant watering can sculpture with mysterious large buttons. Curious Michelle discovered that if you push the wrong/right one, plumes of water erupt and swing about unpredictably, usually drenching the button pusher.



If you happen to take a certain trail you may get to see, deep among shadows, a giant woman sleeping on her side. The Moss Lady is sculpted mostly with living plants. Her size is impressive and as you can see difficult to get in one photograph.



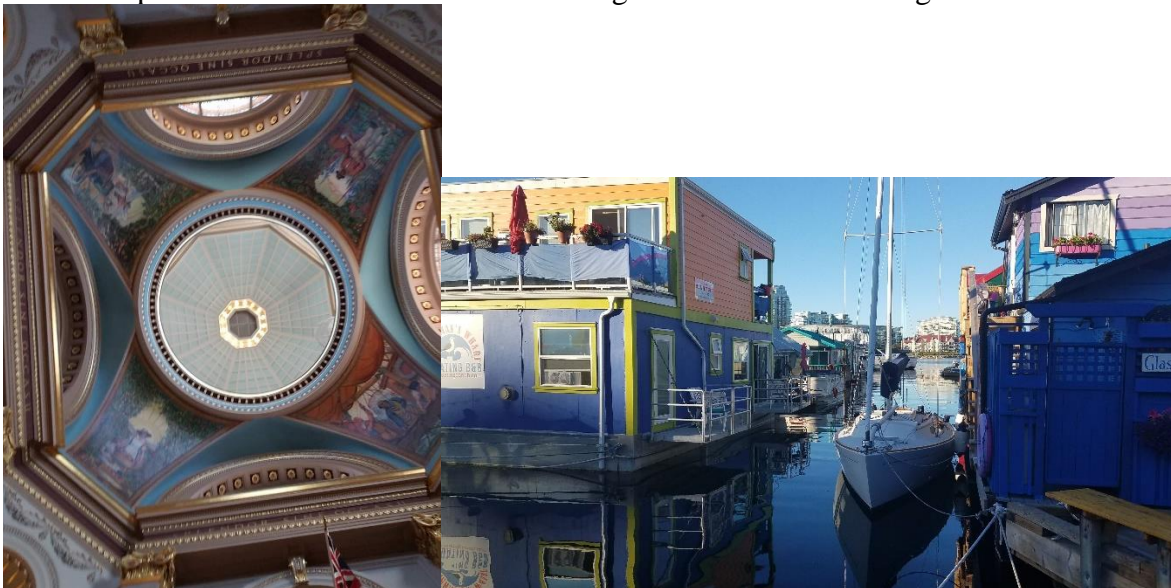
There is an amazing totem pole, said to be the tallest in North America. The aged wood pole arcs a bit as it goes skyward and requires the support of an impressive steel and concrete foundation.



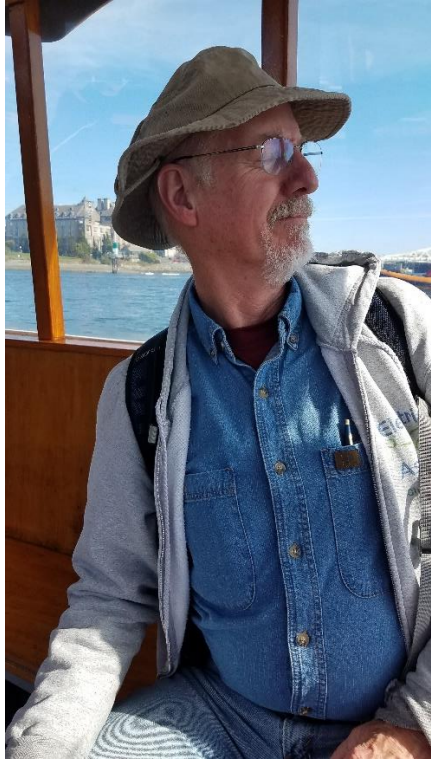


We took an early bus up to Butchart Gardens. Besides the extravagant flowers and fountains we saw many things of interest. A historical carousel is housed in a newer, round, building with “Clear Span” construction. The choice of creatures on which to ride is especially unusual: emus, toads, orcas, pandas, and best of all...giant house cats with a variety of prey squirming in their mouths.

We stopped into the Government building on the way back to the boat house and found it to be much better than one would expect. Re-enactors of Victoria and an Irish laborer filled us in on what to expect when we went inside. Interesting to view the Canadian government details.



Mere steps from our house boat we boarded a comically small round water taxi. Then a short ride across the harbor to the float plane terminal for our return flight. More views of Strait of Juan de Fuca, San Juan Islands, the Olympic mountains, and Kitsap Peninsula, then threading eye-level between the taller buildings of downtown Seattle.





I wish we'd seen the space needle sooner to get a better picture as the plane took it's final turn to splash down in Lake Union. One kayaker looked a bit startled to see us land right next to him.



The car was fully charged during our absence. We bid our friends goodbye and drove to the very comfy Heathman Lodge, with overnight charging, in Vancouver, WA – Just north of the Columbia River.

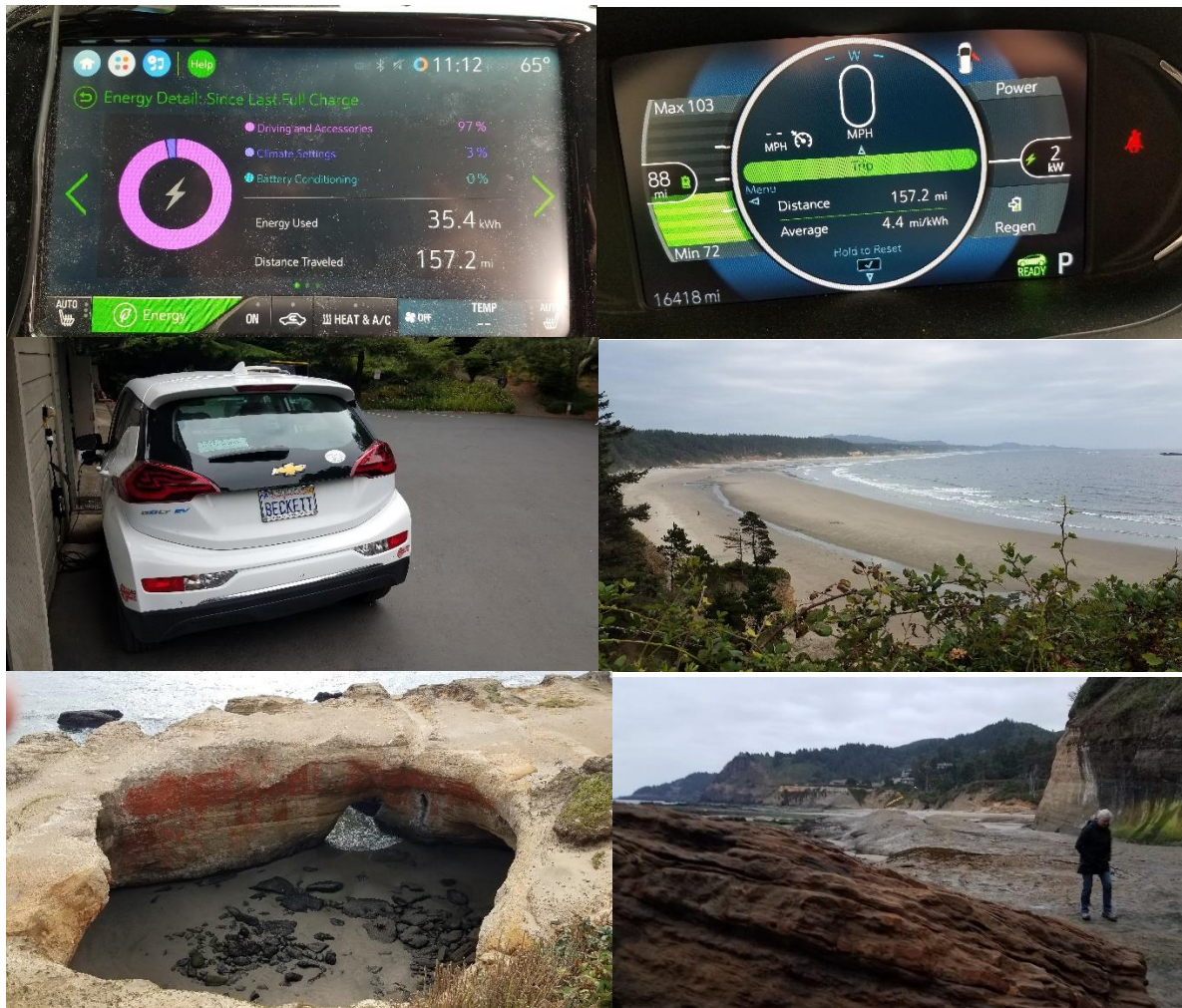


From there we headed south to Corvallis, dropping in to see Otmar, my old friend from Palo Alto days. He gave us a grand tour of his property, workshop, many projects, including a “Wreckla” or two (i.e. resurrected Teslas). He had settled in to this location with many local friends and electric vehicle enthusiasts.



From there we continued to the Oregon coast, staying two nights at Otter Crest Inn, perched above Otter Rock. It's a great spot for tide pools and whale watching. Turns out the head of

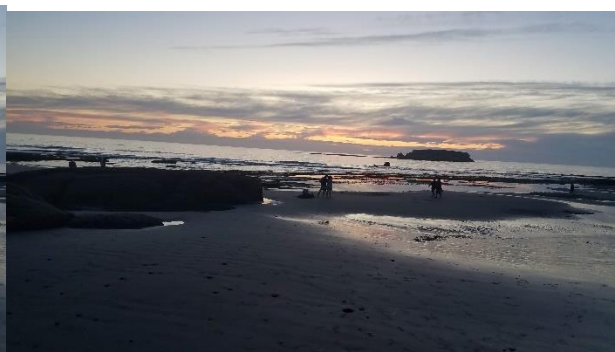
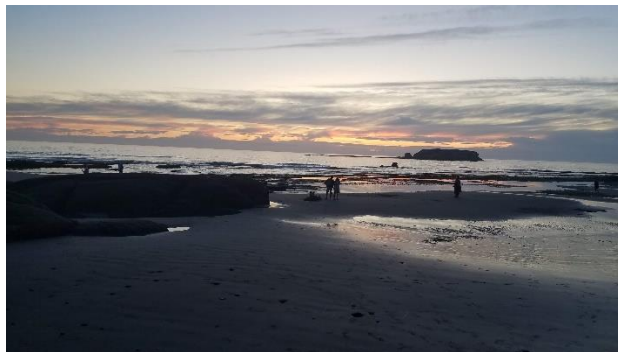
maintenance, with whom I had been emailing about plugging into 120vac at the Inn, is a friend of Otmar. Vince drives a Tesla Model X. I plugged the car in to the outlet outside and didn't move it for two days.



The highlight was the Devil's Punch Bowl, just a short beachwalk from our inn. We hiked to the viewpoint above it during midday high tide hoping to see if the devil had spiked the punch. Sadly it was only half full. Winter storm season's the best time to see the real action. But during an extra low tide at sunset we had plenty of time to enter a low gap and walk around inside the punchbowl, explore the caves, and admire the devilish colors.







We followed the Oregon coast, stopping along the way to see other devilish sites (Devil's Churn, Throe's Well, etc). Thanks to Al Page's recommendation, we followed a most exquisite route by

turning inland at Reedsport onto HWY 38 to Elkton. Then South on HWY 138 to rejoin I-5 at Sutherlin.





This brought us to our next stop, a state historic inn at Wolf Creek, Wolf Creek Tavern. Other than the historic building itself and the charging station, there wasn't much going on here.



(There was an EVgo onsite with only a Nissan quick charge station (CHAdemo) and J1772 but no CCS for everyone else, odd)

On our drive to Red Bluff and planned a return to the same Mt Shasta charging station we used on the drive north because we wanted enough range to swing over toward McArthur Burney and

Lassen parks. We met another person charging his car and had a neighborly conversation. He was a local and gave us tips about the difficulty we might have with the big parks on Memorial Day. He suggested a little known alternative and a more scenic route option to approach our next lodging in Red Bluff.



Thanks to this chat with took HWY 89 over to McCloud Falls. We drove and walked around the park, a gorgeous waterway with three waterfall areas. We ventured further to McArthur/Burney falls. The entrance was backed up for miles, so we opted out of that visit. Had a lovely drive down HWY 299 and ended up with enough time and charge left to explore some historic sites (Jelly's ferry and Ball's ferry), once used to cross the Sacramento. While picnicing in a shady spot the Sacramento river we took a few pictures.







The Hampton Inn at Red Bluff was happy to 'cone' a charging station for us. However, after charging for a while I checked and the wires felt hot. (Always good to check the cables during a charge for excessive heat.) The very hospitable staff loaned me a screwdriver to wire my NEMA 14-50 plug directly into the charging station. Michelle helped by bringing me a headlamp when it started getting dark. All went well and we enjoyed this Inn's pool & views.

The car fully charged that evening, ready for the trip home. Had a bit over 250 miles to travel, so planned to stop somewhere along the way for a short quick charge. Decided on Vacaville (electron city) and stopped at a shopping center for a snack and cool drink. Stayed a bit longer than required for this 125KW charging station (ChargePoint).



Interesting to note the Fiat 500e using the J1772 plug next to me. I expect it did not have a quick charge port but only has a 24KW battery and 7.2KW charger, so would only take about 3 hours for a full charge. As we were just about to leave a new Nissan Leaf pulled up into the space on the left and plugged into the second quick charge station. Didn't look like a Plus so I expect it was the 40KW battery and not the 62KW.



Based on the before and after odometer reading, we travelled a total of 2,422 miles. This was 126 miles longer than the Arizona road trip on May of 2017. Total fees for charging on this trip

at ChargePoint, EVgo and Electrify America, were \$79.29, all other charging was free, so this worked out to about three cents per mile or less than 1 cent per kilowatt

The best part about this trip was the variety of places, landscape, and particularly some of the unplanned explorations. What made it even nicer was that we had no blocked charging stations and they all worked well and as planned.

Only issue with the car is that OnStar and MyChevy application on my smart phone failed somewhere on the western Oregon coast, about the time there was an Android Play update. Having that repaired now that I am home

Attachment A

There are some that just don't understand the relationship of gasoline mileage and electric fuel consumption. Gasoline cars are referred to as ICE (internal combustion engines, also infernal combustion engines) by people in the EV world. ICE cars range from approximately 20 to 50 miles per gallon of gasoline. Electric vehicles measure fuel consumption in kilowatt/hour (kWh). Miles per 1000 watt/hours of energy used. A watt is a measurement of volts times amps.

Electric vehicle fuel capacity is based on the kilowatt/hour of the battery. The Chevy Bolt EV has a 60 kWh battery and its Federal normal miles estimate is 238 miles for the 60kW capacity. That works out to 3.97 miles per kilowatt/hour (kWh). If I drive slowly or hyper mile I am able to get more than 3.97 miles per kWh, then I will get more range. If I drive fast, do a lot of up hill driving or I am driving with a lot of road resistance, air conditioning or heater on, then I will get less than 3.97 miles per kWh. This is really the same concept as an ICE. The charger, built into the Chevy Bolt, is 7.2kWh when plugged into 240 volts alternating current (240vac). So if the 60kWh has been used up, it takes 8.33 hours to fully recover the 60kWh. A bit more than that due to losses in heat in the charger and cables. At 120vac, it will take twice the time because the voltage is half, so 120 times 30 amps or 3.6kWh. The charging unit that comes with the Bolt EV limits the current to 12amps but it will operate at either 240vac or 120vac depending on the plug adapter. Charging at 240vac with this unit is 240 times 12 or 2.88kWh or 20.83 hours of charging time for a 60kWh battery. On 120vac, 1.44kWh or 41.67 hours of charging time. Be sure your Bolt EV is set to 12amps and not 8amps for Level one charging.

The display that come standard in a Chevy Bolt EV show kWh used and miles driven, since the last full charge or mileage efficiency. In the image below, C is kWh and D is miles driven. Also on this display is B, the current outside temperature and A, the time of day. Temperature can cause the Chevy Bolt EV computer to reduce the current during charging to prevent damage to the battery. This display would indicate that the car had driven 4.6 miles on 1kWh. If it were possible to stay at the efficiency for 60kWh, it would yield 276 miles of range.



The speedometer display shows the current miles per kilowatt/hour (C), with speed and total current capacity of the Bolt EV (B). It also includes the standard odometer miles on the car which is useful if you take the picture and don't recall where you were on the trip when the picture was taken. Note in the display marked with a B, there is a Max and Min miles with the expected miles based on your current average miles per kWh. Usually when I am on a road trip, I use the Min miles and compare it to the Google map display showing the miles to my destination. This is not an exact measurement and the total capacity remaining on the battery, shown in green (like a gasoline fuel gage) in the circled area labeled with B. Note the three white lines to the right of the red circle. These mark the quarters of the battery capacity. Assuming a 238 range, each quarter is about 60 miles of range. As your battery capacity is reduced, the Max, Min and expected range numbers get closer together. If the expected miles to your destination is a greater number when the capacity is in the last quarter, you should find a charging station before your final destination. Never happened to me but I do careful planning before my road trips. The lowest level was in Mt Rainer, arriving with 20 miles of range. Note that the color of the capacity indicator changes to orange at the last eighth of the capacity.

