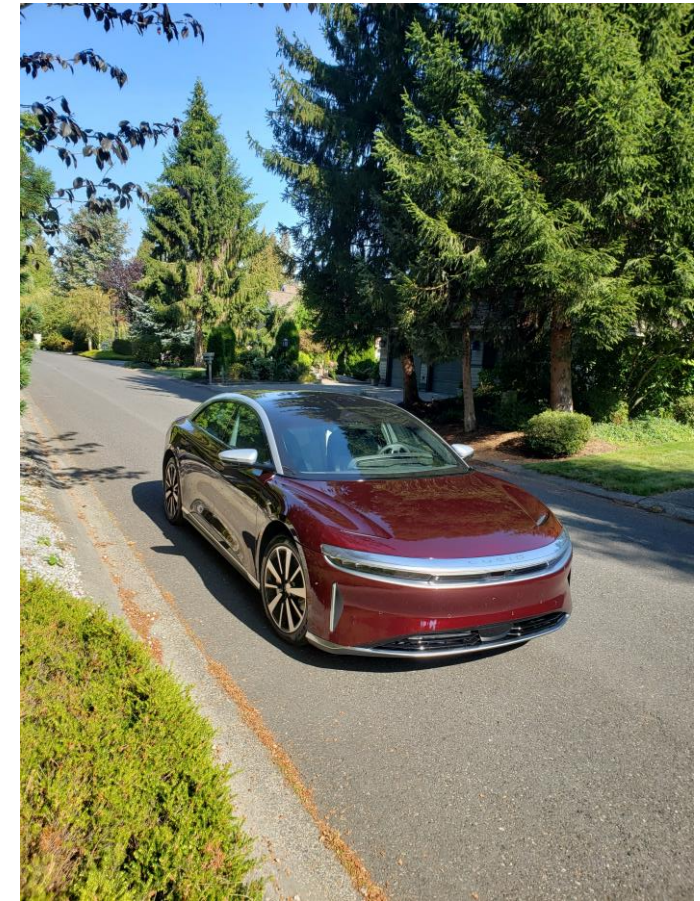


# Lucid Air GT Trip From Blaine, WA To Centennial, CO For Thanksgiving, 2022



This is a write-up documenting our 1500-mile trip from Blaine, WA to Centennial, CO, which is a suburb of Denver. This was our first long-range trip using our new Lucid Air GT, so I tried to collect lots of data that I will be able to use on future long-range trips. I feel this is necessary simply because driving an EV is so different than driving the Internal Combustion Engine (ICE) cars I am used to. Not only are the driving characteristics different, but one must now rely on a charging infrastructure that is still in development and has reported reliability issues. Furthermore, there are so many other potential issues that have greater impacts on EVs given their reliance on a developing charging network. These issues include your driving speed, extra weight besides the driver, cold temperature impacts on how much energy you can get out of and put into batteries, the need to precondition the batteries in advance of charging in cold or hot weather, how one's range quickly decreases going up steep mountain roads and the amazing ability to regenerate some energy going down such mountains, along with headwind impacts on range. As a result of these impacts, instead of looking at your fuel gauge and using that to decide if you need to pull into one of the many gas stations you pass on your route, you end up watching the EV's battery level percentage to guess if you will have enough energy to get you over the upcoming mountains as you approach the last EV charger for the next 100 miles. Thus, one typically plans conservatively when it comes to the use of charging stations as you traverse through unknown territories. This is necessary because you just don't know if the next EV station ahead will work smoothly or even be available. Yes, there are a myriad of Apps one can use to get information on the various charging stations but sometimes this information is not up to date.





## Day 1: November 16, 2022 - Blaine, WA to Yakima, WA

We left our house in Blaine, Washington fully charged. Our Lucid was showing that we had 516 miles of range. However, I knew from my limited EV experience that I would never achieve this range as we were facing a number of mountains we needed to cross. Plus, we would be driving mostly through areas with temperature below freezing and we would be driving at different speeds. All of these factors work to decrease our range but how much, we really did not know.

For the first 90 minutes, the trip was going great. I was driving at speeds between 65 and 75 mph and getting about 3.7 mi/kWh going up over the various hills of less than 600 feet in elevation.

But as we were driving on the freeway which passes through Bothell, WA, we started to hear a thumping noise that was coming from the front wheels. I pulled over and checked the tires and wheels but saw nothing wrong. After continuing our drive, the noise became worse so we decided to exit the freeway and call Lucid's Customer Service.

Parked in the parking lot of a Holiday Express, we described our situation to the Lucid Customer Service representative. She could not offer us a solution to our problem so she called the Seattle Service Center and discussed it with them. Based on this discussion, it was decided that they would send out a tow truck and bring our car into the Service Center to determine the problem and fix it.



Within 30 minutes, our Lucid was mounted on the tow truck and we were in the Lyft ride which Lucid arraigned and paid for. We arrived 40 minutes later and were warmly greeted by the Lucid staff. Within an 90 minutes, Natalie, the Service Representative, said our car was fixed, charged up a bit and ready to go. The problem was a hose clip that came loose and was hitting the front axel as it turned. Only the clip was impacted, not the hose. Armed with two free insulated water bottles that Joshua, the Service Center Manager gave us, we were back on the road. This turned out to be the nicest car service experience we have ever had.

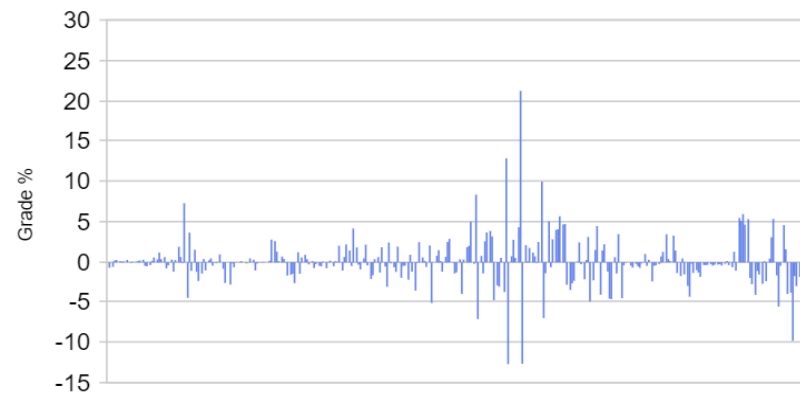
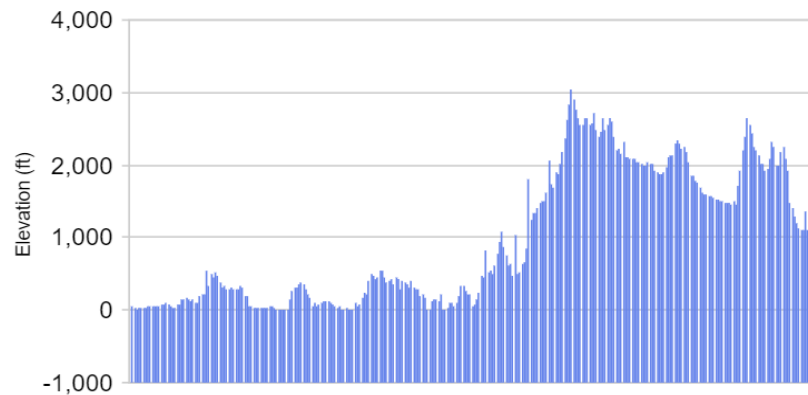
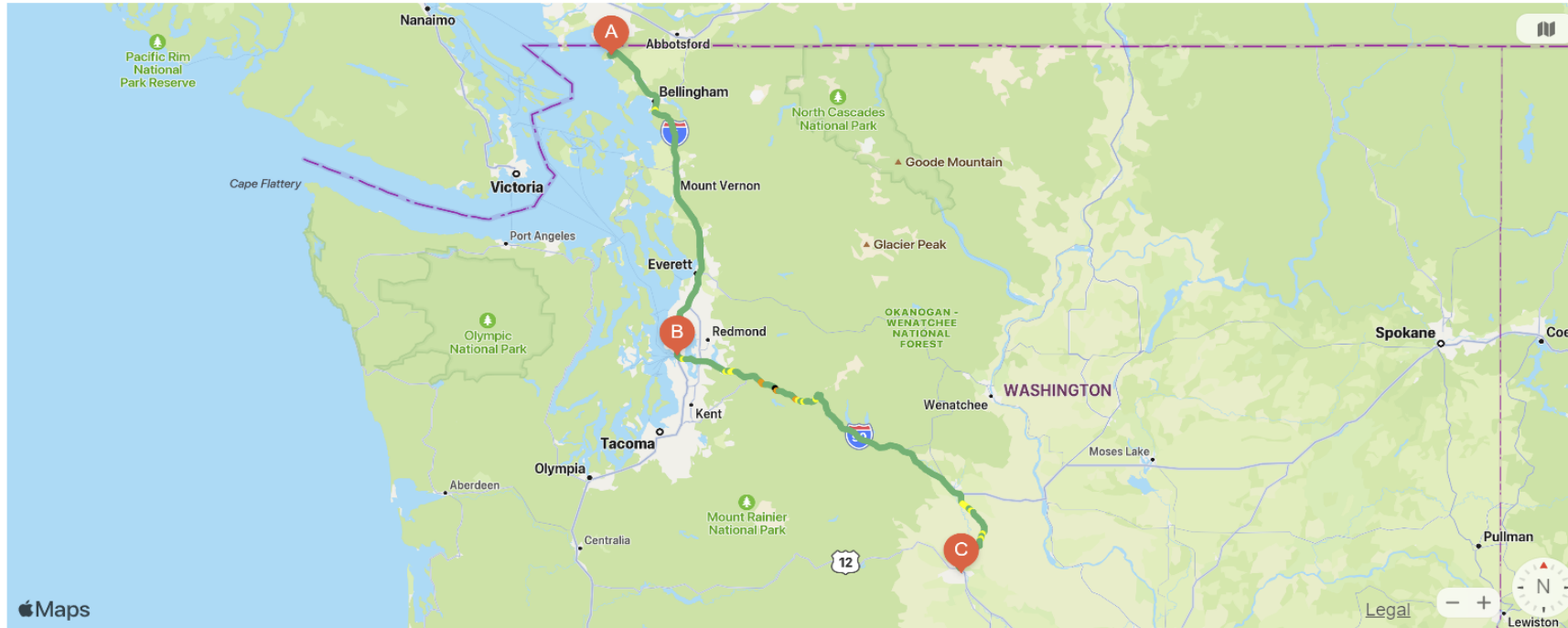
Because of this unexpected delay, we knew we were not going to be able to reach our hotel in Baker City, Oregon. Thus, we called and cancelled our reservation and made a new one for a hotel in Yakima, Washington, about 2 ½ hours away.

We crossed the Cascade Mountains which separate Puget Sound from the Badlands of western Washington in fine style. Driving at speeds between 65 and 80 mph, we traveled the 142 miles in under 2 hours, achieving 2.6 mi/kWh due to the mountains. Our averaged for the day was 2.9 mi/kWh. Since our Lucid has 112 kWh of capacity, this translated to a range potential of 291 miles. This is well under the EPA rating of 516 miles but we went up and down various mountains with a maximum elevation of 3,000 feet using the Adaptive Cruise Control (ACC), our heater, heated seats and steering wheel and seat massages. After checking into our hotel, we drove a couple of miles to the nearest EA charging station to charge for the next day. The following page provides the first day's information.



## FIGURE 1: DAY 1

Elevation from Blaine (Washington) to Yakima via Seattle



Max elevation: 3035 ft / 925 m  
Min elevation: -2 ft / -1 m  
Elevation change: 3037 ft / 926 m

Distance: 251.18 mi / 404.23 km  
Travel Time: 4 hours 3 mins

Max grade: 21.3%  
Min grade: -12.6%  
Steepness score:  $18 + 2126 + 10188 + 8 = 12340$

**November 16, 2022**

Total Miles: 242

Elevation Change: +3037 ft.

Outside Temp : 42 -19 deg.

Sunny to Overcast

Winds: <10 kts

Operated: ACC, heater (80 deg), heated seats & steering wheel, massages, music and Nav System

Speed: 65 to 80 mph

Map and elevation data obtained from:  
[www.flattestroute.com](http://www.flattestroute.com)

## **Day 2: November 17, 2022 - Yakima, WA to Twin Falls, ID**

We were on the road by 7 AM because we had about 475 miles to get to Twin Falls, ID for our next stopover. Once again, the first leg of the trip went smoothly as we crossed the Columbia River and cruised into our first EA charging station for the day. Located at the Space Age Fuel truck stop, right off of the I-82/84 exit just south of Hermiston, Oregon, it was easy to find and get to. Just one of the four chargers was being used. We plugged into a 350-kW charger with high expectations of a super-fast charging session. Unfortunately, I had forgotten to precondition the batteries until just a few minutes before arriving. Sigh!

On cold days like today 31 deg. (and dropping), the batteries are not ready to except a high voltage transfer of energy. Electrons actually get sluggish when trying to flow into or out of a metal oxide medium like our lithium batteries. Thus, it is very important to bring the temperature of the batteries up to a warm state (above 60 degs.) before charging. Since my batteries were well below that temperature, the Lucid's Wunderbox limits the amount of amps into the batteries to protect them.

Nevertheless, since I had preconditioned for a few minutes, we were allowed to start charging with 158 kW. We had arrived with a State of Charge (SOC) of 56%. We used 35 kWh to drive the 110 miles from Yakima, yielding 3.1 mi/kWh. As shown in the graphs in Figure 2, the grades were not too bad with just a couple at 8% with the longest grade just climbing a little over 800 feet. Compared to the drive through the Cascades yesterday, it was a piece of cake.

As we approached the town of Pendleton, we received an notification from Alexa telling us the freeway was closed just before Deadman Pass and after Squaw Creek Overlook due to icy fog and bad road conditions. Yikes!



With each exit we passed, we saw more and more trucks pulled off onto the side of the exit ramps. Literally, there were 100s and 100s of trucks pulled over. As we approached the exit for the Wild Horse Casino, we discovered that the police had put barriers up and we were forced to pull over or exit. Knowing that a casino was nearby, we opted to go there and have an early lunch and play the slots as we waited for the roads to be salted. The dangerous nature of the roads was made clear to us as we slowly passed a semitruck that had skidded off the road and crashed.



In a couple of hours, we returned to our car after losing some money and having a bite to eat. The freeway was opened and the long line of trucks were gone. Yea! However, we soon discovered that the roads were wet and still a bit slick with temperatures in the upper 20s and the air was foggy with limited visibility for the first 20 or so miles. The Lucid hugged the road well but we kept our speed to below 50 mph due to visibility problems.

Finally the fog lifted and the roads dried out so we were able to up our speeds back to about 80 mph. For the second day in a row we had lost time due to unforeseen problems. However, today we decided to just push on until we reached our hotel in Twin Falls, Idaho.

To get there we stopped at EA charging stations located in Island City, OR and Boise, ID. In Island City, we pulled up to a 350 kW charger. Since I, once again, forgot to precondition the batteries early enough, it took 24 minutes to go from a SOC of 42% to 72%. Because of the icy fog delay, it took us almost 4 hours to complete this 90 mile leg.

We arrived in Boise with a SOC of 18% and pulled up to a 150 kW charger. It took 45 minutes to charge up to 72% SOC. We had traveled 167 miles, averaging 2.7 mi/kWh due to the cold temperatures. We ran our ACC, heater, heated seats and steering wheel while driving at a speed of 90 mph. The land was relatively flat with no major grades for this leg.

While we charged, we went into the nearby Walmart and bought a couple of pre-made packaged soups and salads to have for dinner in our hotel room since we would be arriving late, after a long day of driving.

We pulled up to our hotel in Twin Falls after driving another 130 miles. The next EA charging station was just 40 miles away in Heyburn, ID. It would be our first stop the next day. Figure 2 provides the data for this leg of our trip.

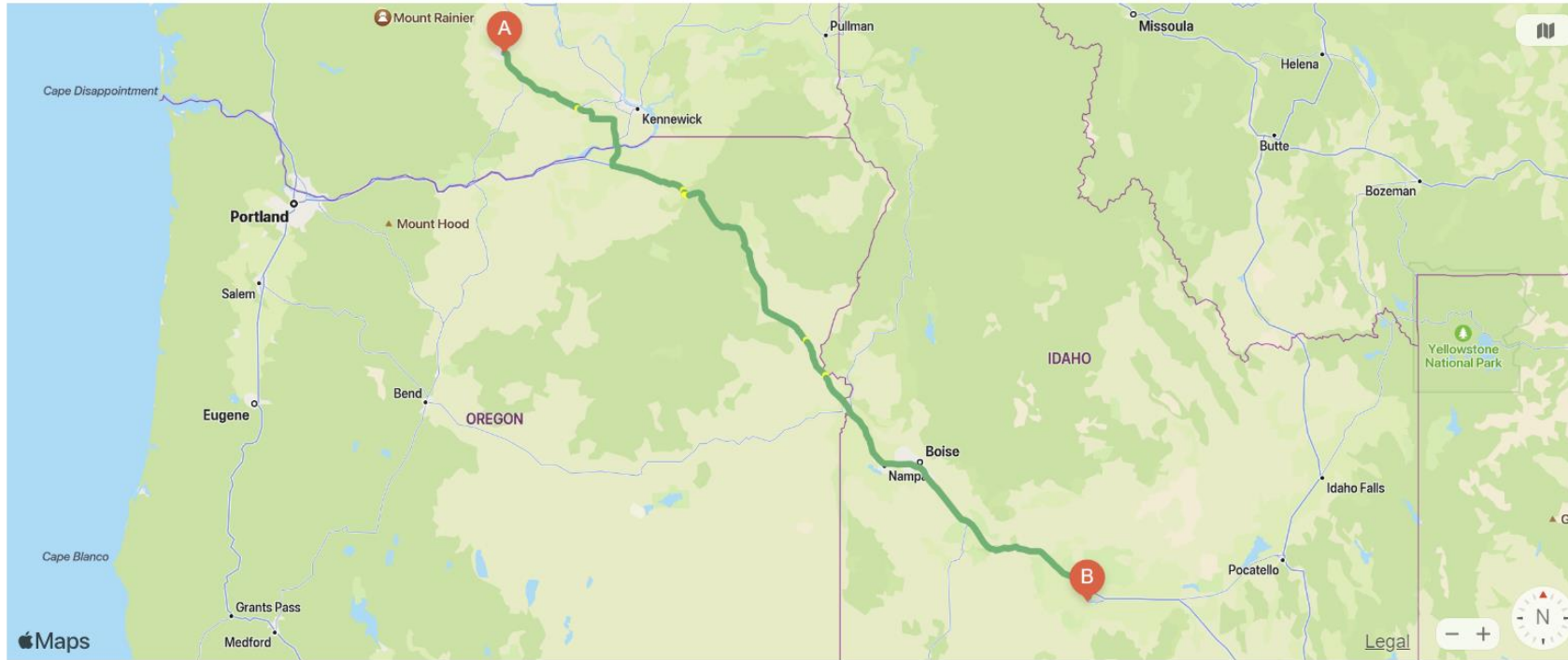




## Elevation from Yakima to Twin Falls

## FIGURE 2: DAY 2

[change route](#)



**November 17, 2022**

Total Miles: 484

Elevation Change: +3866 ft.

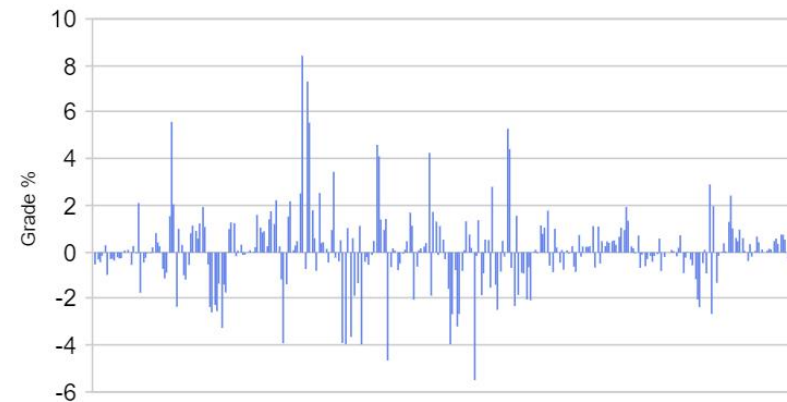
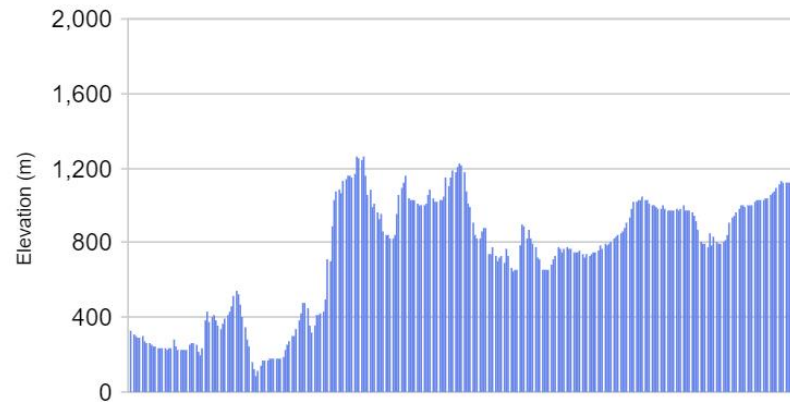
Outside Temp : 24 -15 deg.

Icy Fog to Overcast

Winds: <10 kts

Operated: ACC, heater (80 deg), heated seats & steering wheel, massages, music and Nav System

Speed: 65 to 90 mph



Max elevation: 1260 m / 4135 ft  
Min elevation: 82 m / 269 ft  
Elevation change: 1178 m / 3866 ft

Distance: 767.68 km / 477.01 mi  
Travel Time: 7 hours 19 mins

Max grade: 8.4%  
Min grade: -5.5%  
Steepness score: 44 + 844 + 5374 + 15 = 6277

Map and elevation data  
obtained from:  
[www.flattestroute.com](http://www.flattestroute.com)

### **Day 3: November 18, 2022 – Twin Falls, ID to Grand Junction, CO**

The next morning was very cold, around 10 degrees. I preconditioned the batteries and heated the interior of the car from our hotel room using the Lucid App. When we got into the car, it was a toasty 85 degrees and the batteries were ready to go. We quickly drove the 40 miles to Heyburn, ID and our next EA charging station.

We pulled up to a EA 350 kW charger and plugged in. So far, every EA charger we had used worked great and the only charging issues we have had were caused by me not adequately preconditioning the batteries enough.

For the run between our last charge in Boise to here, we drove 170 miles, used 74 kWh. By now our mileage efficiency had dropped down to just 2.3 mi/kWh. This was caused by the two preconditioning sessions I did today (the first was to get the car ready this morning, the second was as we approached this charging station), the impact of 20 to 25 knot head winds, using Highway Assist (HA), heater, heated seats and steering wheel, and massages at times and driving at 90 mph.



Picture credit: Scott Crawford, Sinker Stores, Sinclair Gas Station, Heyburn, ID

This charging session took 34 minutes as we charged up from the arrival SOC of 20%. I am afraid I can not report the SOC we left at because I failed to write that down. I know we added 68.8 kWh but I can not convert that to a SOC because of unknown heat losses in the batteries and the EA charging cable.

Once we were charged up enough, we headed back to the I-84 freeway and took off towards Perry, UT, where our next charging session would be.

We arrived at this EA charging station with 28% SOC, averaging just 2.3 m/kWh due to the continuing 25 kt head winds, 90 mph speed and running HA, heater, heated seats and steering wheel, and massages at times, plus the mild hills we traversed. We started charging at 168 kW due to no preconditioning. I started preconditioning when I plugged in. Thus, In 34 minutes, our SOC was up to 80%.

Back on the road, we were now heading toward the EA charging station located in Spanish Flat, UT. It was only 110 miles but it would be the last EA station before we crossed over the mountains on US Highway 6, which was mostly 2 lanes on our way to Green River, Utah. I wanted to be sure we had enough battery capacity to get us to Green River and then on to Grand Junction, CO. We had a hotel there waiting for us.



Picture Credit: Nathan Strain, Perry, UT



The road to Spanish Flat was relatively flat and took us through Salt Lake City. Using the car pool lane, we zipped past most of the other cars doing about 80 mph. Soon we were pulling into the Spanish Flat EA charging station. We had averaged 3.0 mi/kWh and used just 35 kWh. We had run the ACC, heater, heated seats and steering wheel. On a 350W charger, it started at just 138 kW (mostly because our batteries were not very depleted) and filled us up to a SOC of 90%.

Soon, we were back on the road, making our way up the mountains through the small town of Perry, UT. It was a sunny and dry day without much wind but the grades at times were pretty steep. At one time, we were on a 6% grade and a passing lane appeared. I pulled over into it, stepped on the pedal, and was at 105 in a flash, safely passing the other cars before the passing lane ended. The Lucid never felt the grade and when I backed off of the pedal, I felt I had infinite power because I could have kept on accelerating to higher speeds if needed. What a totally amazing car this is: all of the comforts and sophistication of a luxury sedan, with the driving characteristics of a high-end sports car and the power of a dragster. How Lucid Motors is able to capture all of this into a single car just blows my mind!

We came down the mountains and cruised through Green River, UT, averaging 3.4 mi/kWh. This was because we were able to regenerate the batteries coming down the steep grades of the mountain even though we were going about 70 mph. Since we still have plenty of battery capacity, we decided to press on to Grand Junction, CO.



Spanish Flat, UT EA Charging Station

Once we reached Grand Junction, we decided to charge the car up before going to our hotel. The EA charging station was located at a Sam's Club. After plugging in the car, I ran inside to use the bathroom. However, when I returned my wife informed me that we were only charging at 78 kW. Being tired and hungry, I suggested that we just go to the hotel and after dinner I would return and finished the charging using a different unit.

After dinner I returned to Sam's Club and found another 350 charger that was available. I plugged in and started charging at 195 kW. I sat there and napped until we were at a SOC of 91%. Between the two charging sessions, we added almost 97 kWh.

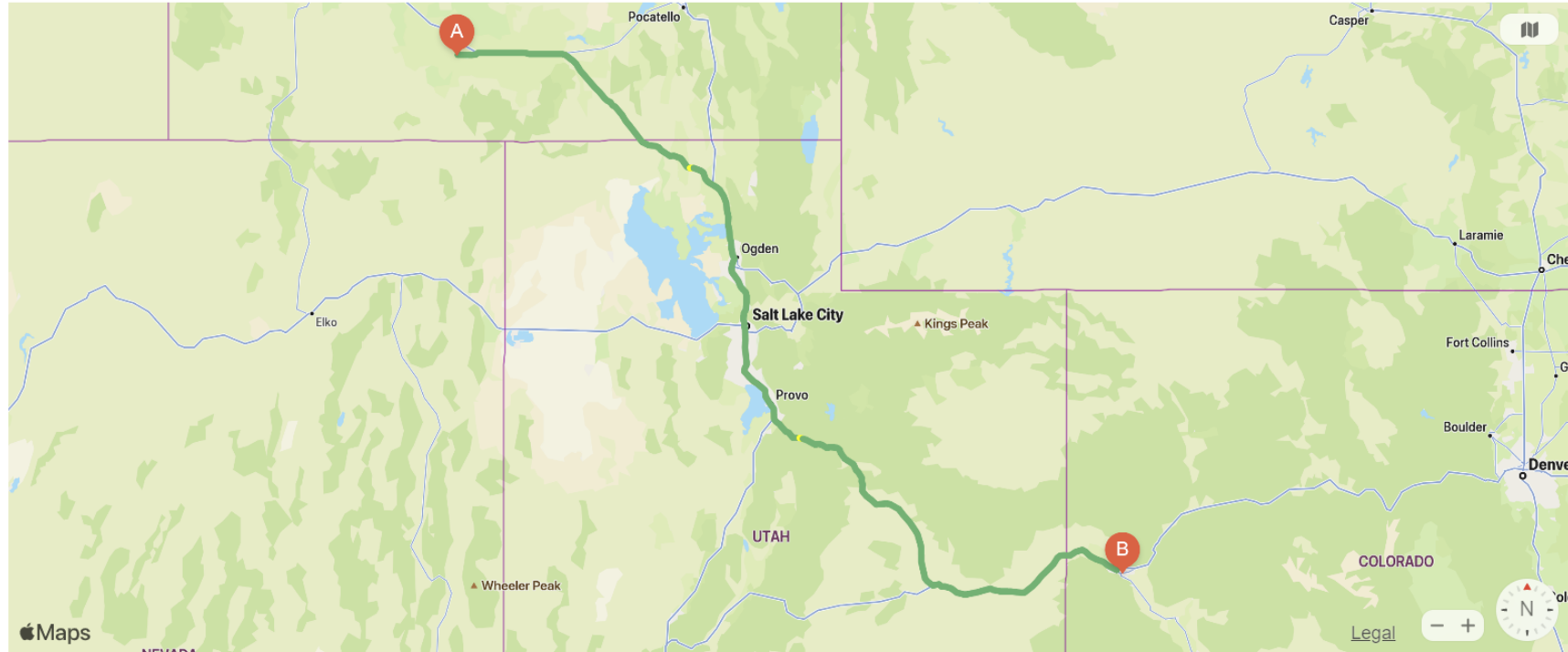


As an aside, I wish to note some information another person passed on to me when I was charging this EA stations. While charging, I noticed a fellow plugging into the charger I had previously used and he was only getting 78 kWh. I mention this to him and he said that meant the EA charging cable cooling oil level was low and the EA charger was limiting the amount of current through the charging cable to prevent the cable from overheating. He simply unplugged this cable and then plugged in cable located on the other side of the charger. Apparently, that cable had enough cooling oil because he just let it run to charge his car up.

The next morning, we knew we would be facing the steepest part of our journey. We would be climbing up to an elevation close to 12,000 feet before dropping down into the Denver area. According to my research, one part of the road had a grade of 25.9% with slope angle of 15 degrees!

## Elevation from Twin Falls to Grand Junction (Colorado)

### FIGURE 3: DAY 3



**November 18, 2022**

Total Miles: 502

Elevation Change: +3755 ft.

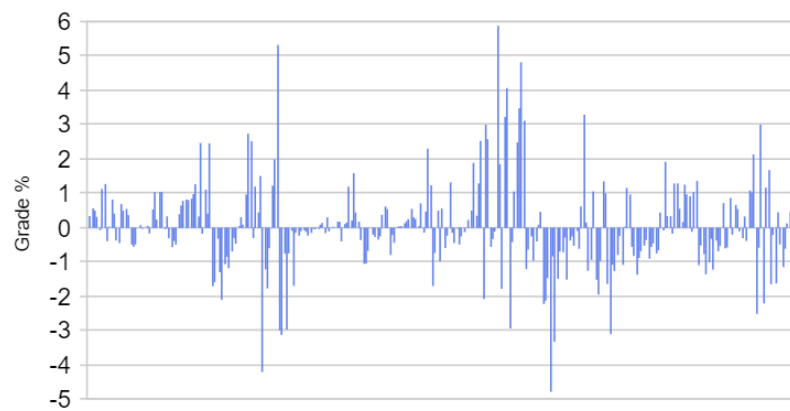
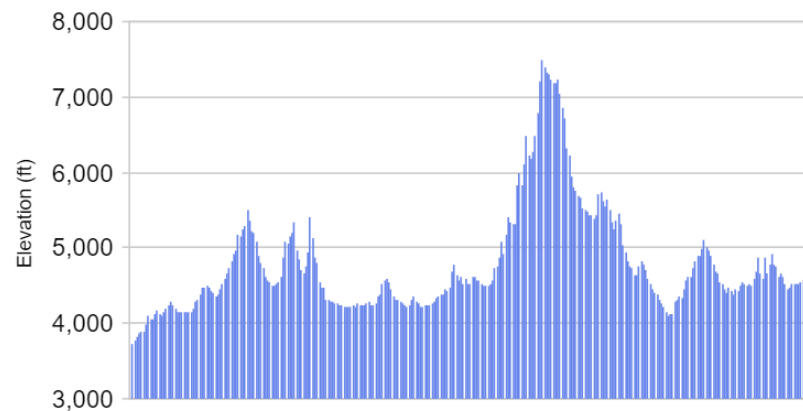
Outside Temp : 22 -10 deg.

Sunny

Winds: < 15 kts

Operated: ACC, HA, heater (80 deg), heated seats & steering wheel, massages, music and Nav System

Speed: 65 to 90 mph



Max elevation: 7487 ft / 2282 m  
Min elevation: 3733 ft / 1138 m  
Elevation change: 3755 ft / 1144 m

Distance: 497.4 mi / 800.48 km  
Travel Time: 7 hours 29 mins

Max grade: 5.9%  
Min grade: -4.8%  
Steepness score: 87 + 589 + 4545 + 16 = **5238**

Map and elevation data  
obtained from:  
[www.flattestroute.com](http://www.flattestroute.com)



#### **Day 4: November 19, 2022 - Grand Junction, CO to Centennial, CO**

This was going to be the shortest of the four-day legs of our trip. Our daughter's home was only about 250 miles but it would be going through the highest elevations found throughout the US Interstate system. The Eisenhower Tunnel is at an elevation of 11,750 feet, which was about 7,700 feet above us at our hotel in Grand Junction. The anticipated power draw on our batteries was an unknown. While in theory our Lucid's range capability (516 miles) should be more than enough to get us there easily, that range was based on driving in warm weather conditions on a flat road. Climbing about 1.5 miles in altitude was not factored into that range number.

To be safe, we planned another short drive to the next EA charging station located in Edwards, CO. Edwards is at about 7,500 feet and the EA charging station is strategically located there to make sure people could charge up before tackling the highest elevation across the Rocky Mountains via an Interstate freeway.

The morning was another cold one with temperatures hovering around 15 degrees. However, it was sunny and bright and the road conditions were ideal. We preconditioned the batteries once we had breakfast and this dropped our SOC down from 91% to 86% by the time we entered the car.



Photo Credit: Wikipedia. I-70 at Glenwood Canyon



Off we went and really appreciated the glass roof along the way. The scenery was spectacular with tall snow-covered mountain tops raising straight up above us. Much of the freeway was engineering and constructed to follow a steep river gorge that cut deeply into the mountains. Thus, we had the white-water river just below us and the steep gorge walls rising above us. I had to keep my eyes on the very windy road much more than I wanted to but I enjoyed listening to the “ohs” and “ahs” being uttered by my wife as we rounded each bend.

We arrived in Edwards with a SOC of 33% after traveling just 133 miles. With preconditioning of the batteries twice, along with running the normal stuff to keep us warm and the steep grades we went over (one was reported as 15%, 8.75 degrees slope angle. See Figure 4), this run really made a dent in our energy level. I had averaged about 75 mph on this run. Our mileage efficiency was 2.5 m/kWh.

The EA charging station was great with a number of 350 kW chargers. However, we only started charging at 125 kW even though I had fully preconditioned the batteries. There was couple of cars charging so maybe they had an impact on the amount of energy we could draw from our charger. We decided to charge up to 75% so that we would have plenty when we



Photo Credit: Blake Gordon



Photo Credit: Jose Arturo, Edwards EA Charger Station

arrived at our daughter's home. It took 33 minutes to add 57.5 kWh, bring us up to a SOC of 75% We now took off, ready to face the steepest and highest part of our entire trip. We went up a number of challenging grades but, by far, the steepest was before we reached the maximum altitude of our trip. As we approached 11,000 feet we hit a grade reported to be 26.7% (a 15% slope angle). The power contained in the Lucid's two motors never skipped a beat as we passed ICE cars struggling with the grade. What a car!

Soon we were through the Eisenhower Tunnel, making the summit of our trip and were coasting down off the mountain using the regen capabilities of our car. There were still some minor grades we traveled up and over but the challenging part of the trip was over. We cruised into Centennial and pulled up to our daughter's house 1.5 hours before we had said. Michael, Christina's husband was still shoveling the snow off of their driveway and initially did not recognize us in our new car. The look on his face as we rolled down the window and gave our greetings was a hoot!



Photo Credit: Colorado Public Radio, Eisenhower-Johnson Tunnel, West Entrance

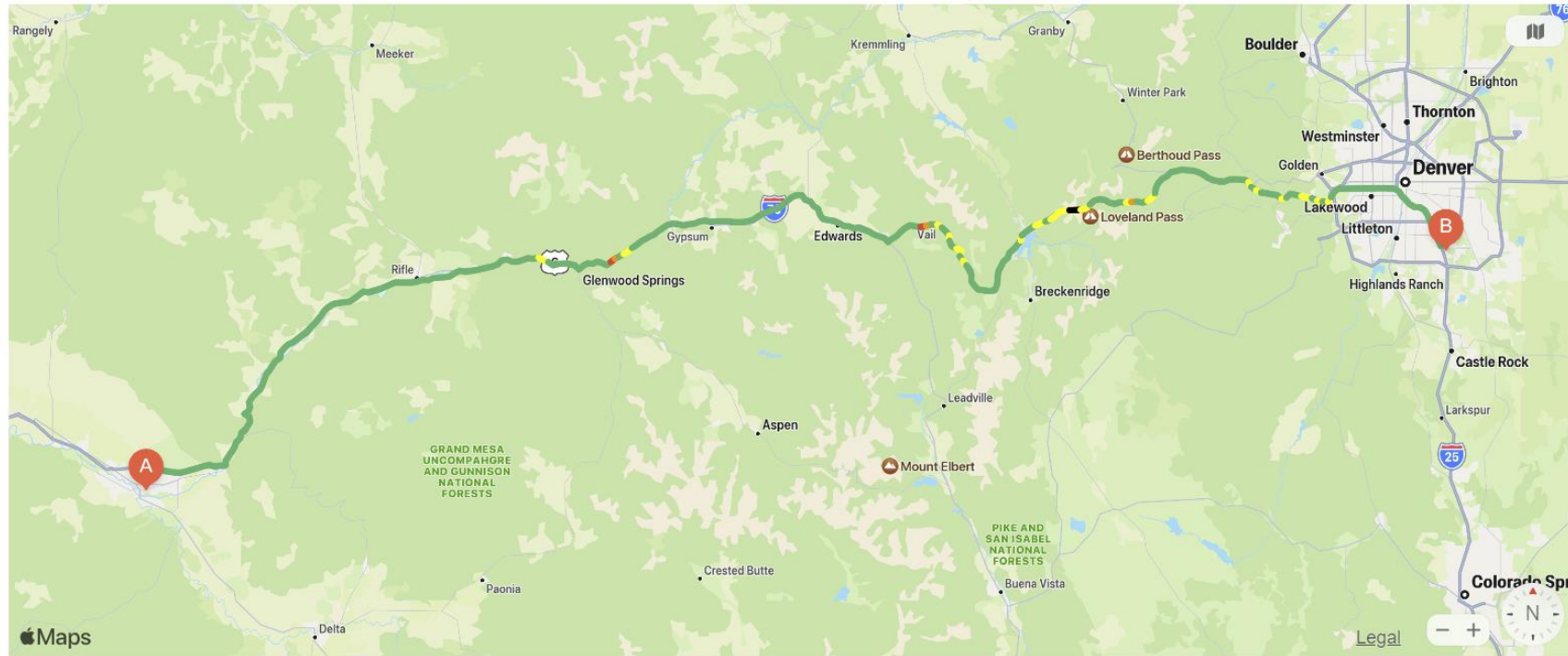
Figure 4 gives the data for this leg of our trip.

Figure 5 presents route, elevation and grade profiles, location of charging stations used, and range efficiency achieved (reported in values of mi/kWh) of the complete trip and Table 1 presents a tabulation of data collected and reported.



## Elevation from Grand Junction (Colorado) to Centennial

### FIGURE 4: DAY 4



**November 19, 2022**

Total Miles: 254

Elevation Change: +7,733 ft.

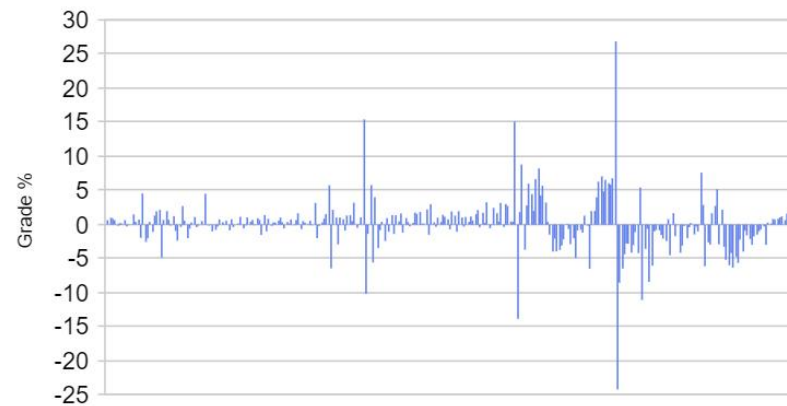
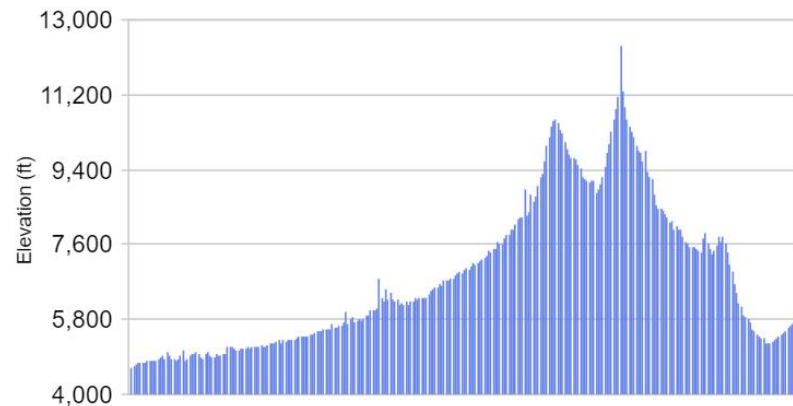
Outside Temp : 10 - 38 deg.

Sunny

Winds: <10 kts

Operated: ACC, heater (80 deg), heated seats & steering wheel, massages, music and Nav System

Speed: 65 to 90 mph



Max elevation: 12364 ft / 3769 m  
Min elevation: 4631 ft / 1412 m  
Elevation change: 7733 ft / 2357 m

Distance: 254.74 mi / 409.97 km  
Travel Time: 4 hours 2 mins

Max grade: 26.9%  
Min grade: -24.2%  
Steepness score:  $125 + 2691 + 12721 + 8 = 15545$

Map and elevation data  
obtained from:  
[www.flattestroute.com](http://www.flattestroute.com)

Figure 5:  
Route, Elevation and Grade Profiles,  
Location of Charging Stations Used,  
and Range Efficiency Achieved (reported  
in values of mi/kWh)

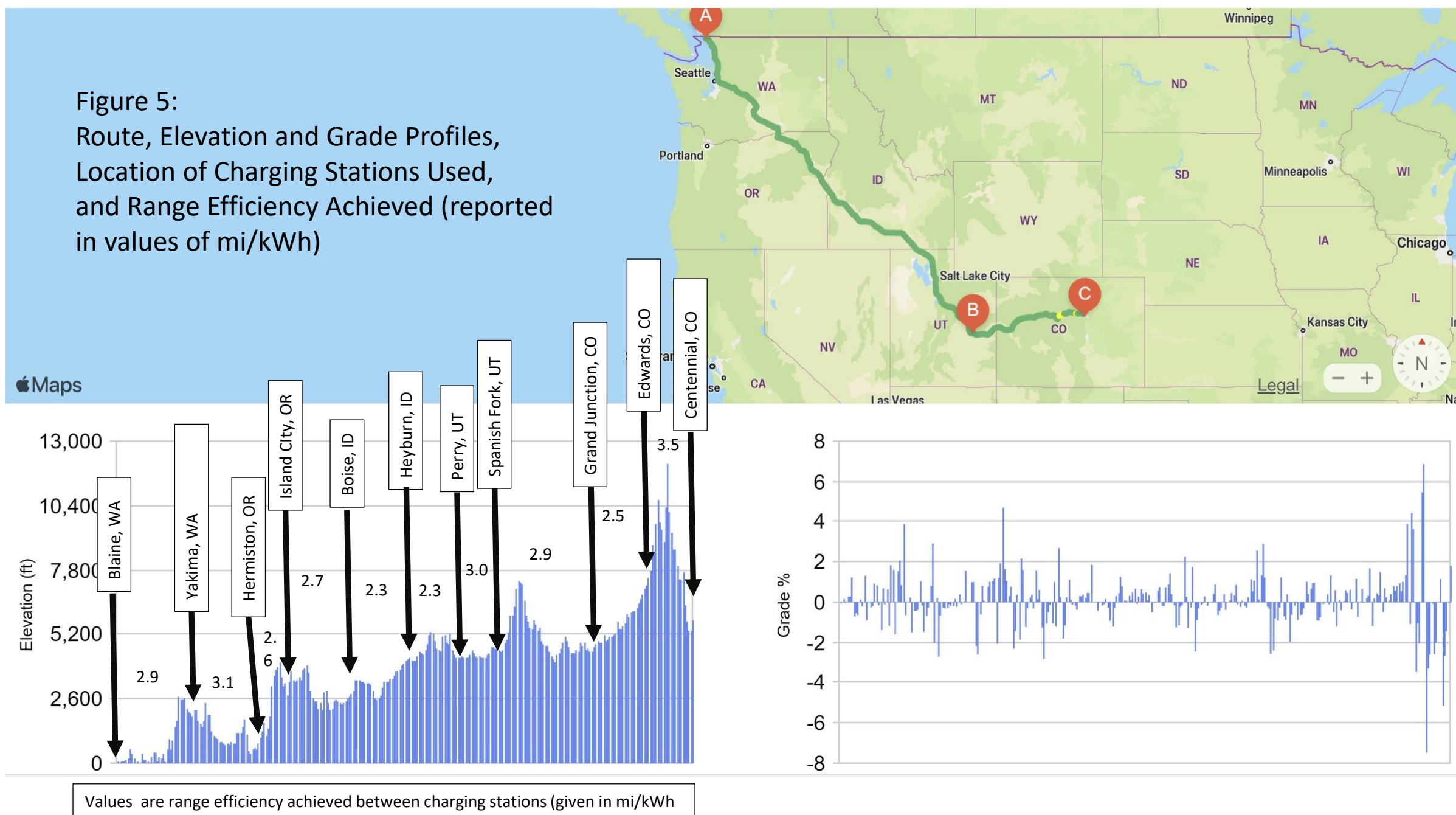


Table 1: Tabulation of Data Collected During Our Lucid AGT Trip Between Blaine, WA and Centennial, CO

Location	Date/Time	Mileage	Trip Distance (mi)	Arrival SOC	Depart SOC	Trip mi/kWh	Charger Type	kW Rating	Starting kWh	Stopping kWh	kWh Added	Charging Time (min)	Comments
Home	11/16/2022	1781			100%		Home						Speed, elevations, wind, temp., heater, chair warmer, HA, ACC, etc.
Seattle LSC	11/16/2022	1878	97 mi to Bothell, WA then towed to LSC	71%	80%	3.4	LSC	?	?	?	?	?	70mph, 45deg, ACC, heater. Towed to LSC due to clip rubbing on axel. LSC added some charge
1) Yakima, WA	11/16/2022	2020	142	45%	91%	2.9	EA	150				50	75mph, 2.9 for day but 2.6 over Cascades
2) Hermiston, OR	11/17/2022	2130	110		72%	3.1	EA	150					75 mph, heater, message, heated seats & steering wheel, 45 degs. Flat to gentle rolling hills
3) Island City, OR	11/17/2022	2220	90	42%	72%		EA	350			41.9	24	75 mph, freezing fog closed I-84 for three plus hours. 20 degrees climbing mountains.
4) Boise, ID	11/17/2022	2387	167		90%	2.7	EA	350			86.8	45	79 mph on OR, 89 mph in ID. 15 degrees. Heated seats and steering wheel, heater, message chairs. Down grade in general?
5) Heyburn, ID	11/18/2022	2556	169	20%		2.3	EA	350			68.8	34	15 degrees, 90mph with 20 to 30 knot headwinds, heater, heated seats and steering wheel. Flat with some hills and small mountains
6) Perry, UT	11/18/2022	2684	128	28%	80%	2.3	EA	350			65.2	32	90 mph, 15 degrees strong headwinds, heater, heated seats and steering wheel.
7) Spanish Fork, UT	11/18/2022	2790	106		90%	3	EA	350			49.6	35	80 mph, 20 degrees, heater, heated seats and steering wheel, message, flat to slight hills

Note: kW Added includes heat loss inherent in charging



Table 1: Tabulation of Data Collected During Our Lucid AGT Trip Between Blaine, WA and Centennial, CO

Location	Date/Time	Mileage	Trip Distance (mi)	Arrival SOC	Depart SOC	Trip mi/kWh	Charger Type	kW Rating	Starting kWh	Stopping kWh	kWh Added	Charging Time (min)	Comments
Green River, UT	11/19/2022	2921	131	–	–	3.4	–	–	–	–	–	–	74 mph with bursts up to 101 mph up mountains and then down. 48 degrees, Went on to Grand Junction CO w/o stopping
8A) Grand Junction, CO	11/19/2022	3036	115	18%	25%	2.9	EA	350	78	–	12.7	11	Could only get 78kW from charger. Charged for just a few minutes and went to hotel. Returned and hook up to another 350 charger and got 195 kW. See below for trip details
8B) Grand Junction, CO	11/19/2022	3048	12	24%	91%	2.9	EA	350	195	approx 53	85		Elevation is 4583"
9) Edwards, CO	11/19/2022	3184	136	33%	75%	2.5	EA	350	125		56.1	33	75 mph up 20 mile steep grade @2.2 mi/kWh. Temp 15 degs, heater heated seats and steering wheel. Elevation at Edward is 7500 ft. w/ 2.5 mi/kWh for this leg.
10) Centennial, CO	11/20/2022	3322	138	40%	85%	3.5	EA	150	125		57.5	45	Climbed 7552' To 11,158' @ 75mph &2.0mi/kWh. Then down to 5837' @ 80 to 75mph 28 degs. Heater message. Downhill brought it to 3.5mi/kWh for the trip. Sprintedd many times with kids in Centennial.

Note: kW Added includes heat loss inherent in charging

Distance Traveled	1541	miles
Average Efficiency	2.81	mi/kWh
Average Temperature	20	degrees
Maximum Elevation	11750	feet
Minimum Elevation	10	feet
Starting Elevation	180	feet
Final Elevation	5781	feet
Extra Weight In Car	350	lbs.