Driving an Electric Vehicle in Alaska

#1: How does it do in winter ?

Ice/ Snow Handling

- Heavy
- Low center of gravity
- All wheel drive, Blizzak
- =Great handling

Cold Comfort

- iPhone heater control
- Instant on heater
- Guilt-free “idling”
- Heater = battery drain

Regenerative Braking

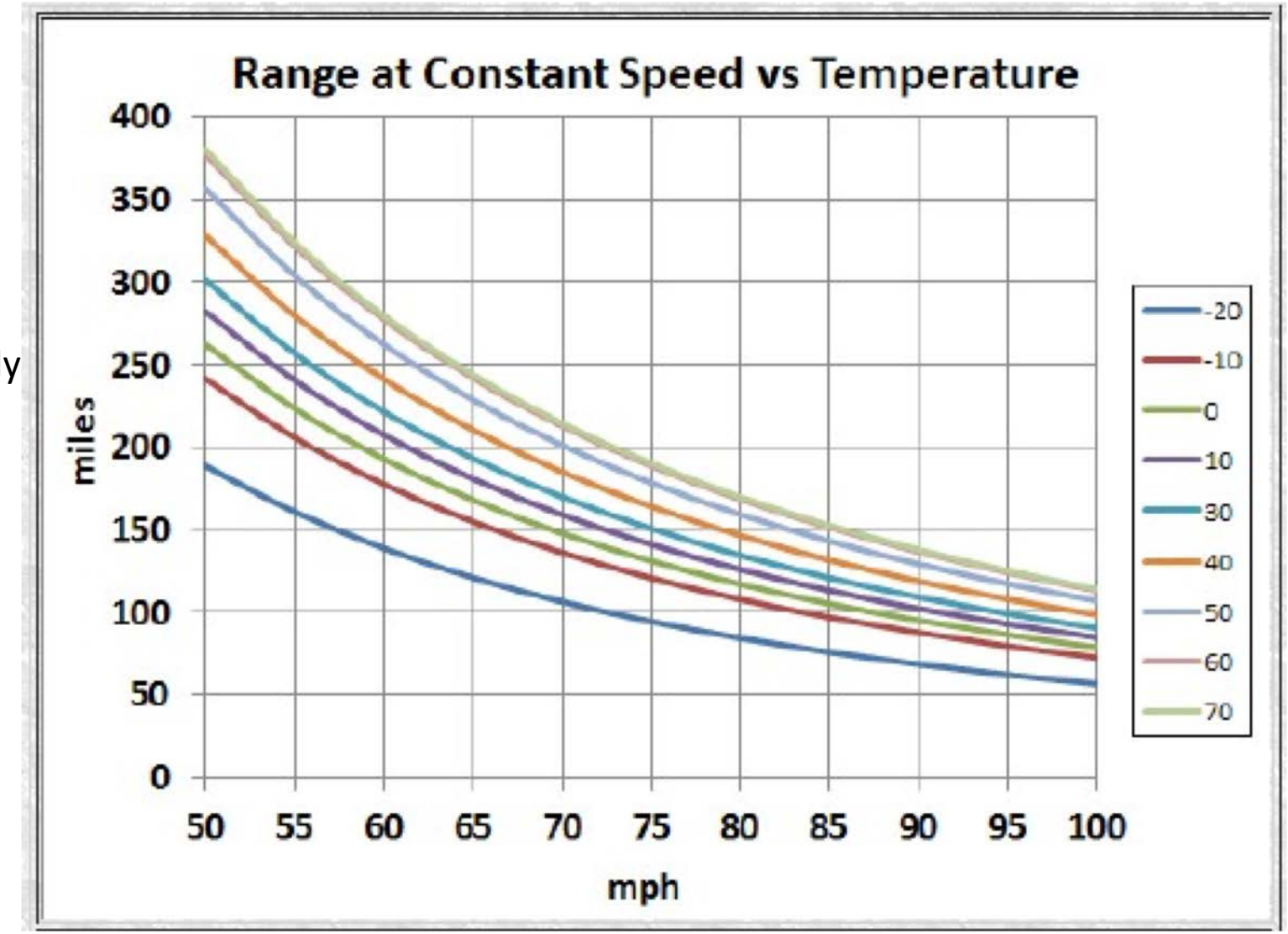
- Reduced when battery is cold

Most comfortable winter car I’ve ever owned.

#2: How does cold affect range ?

FBX

Healy

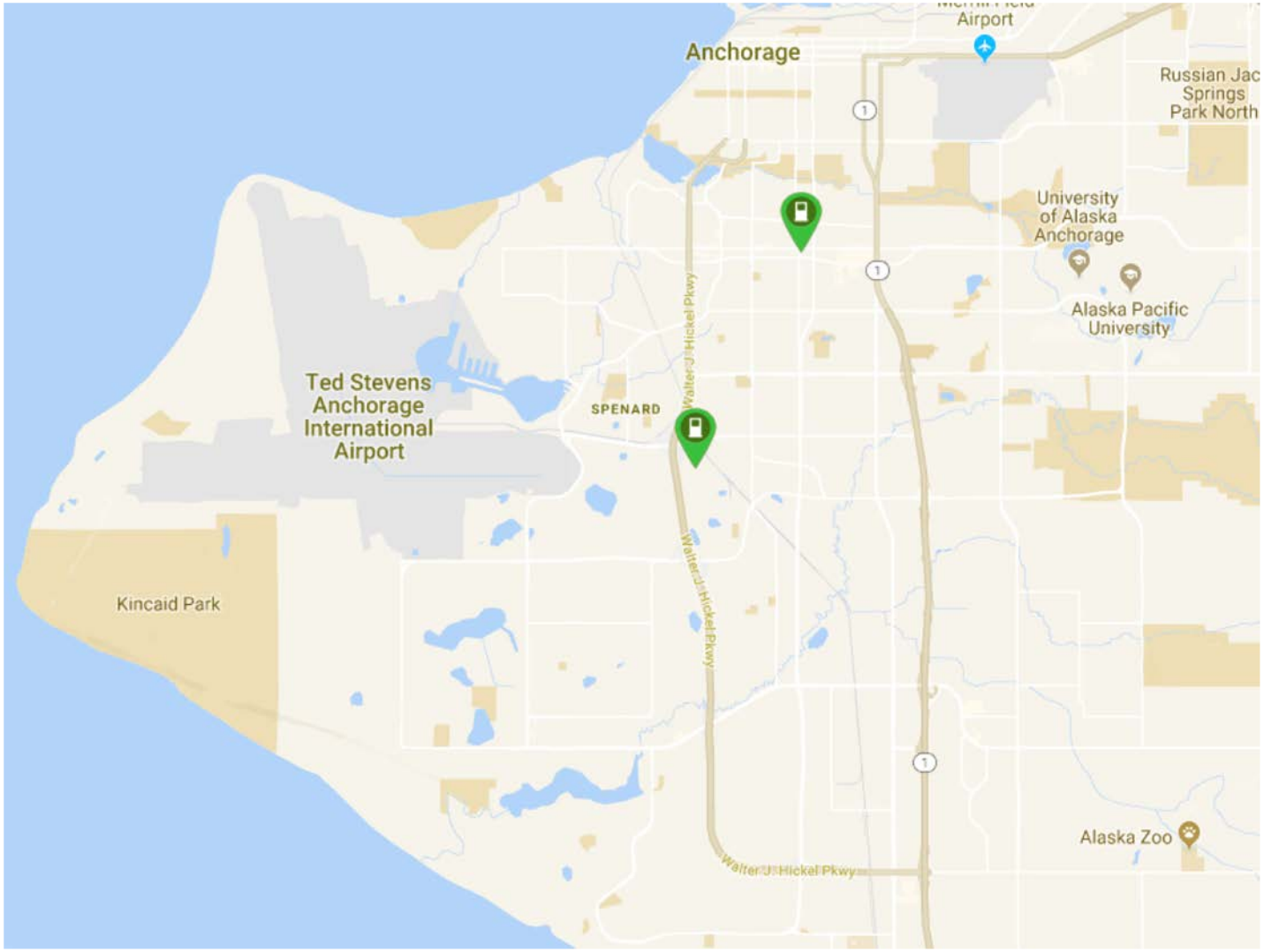


Data for Chevy Bolt

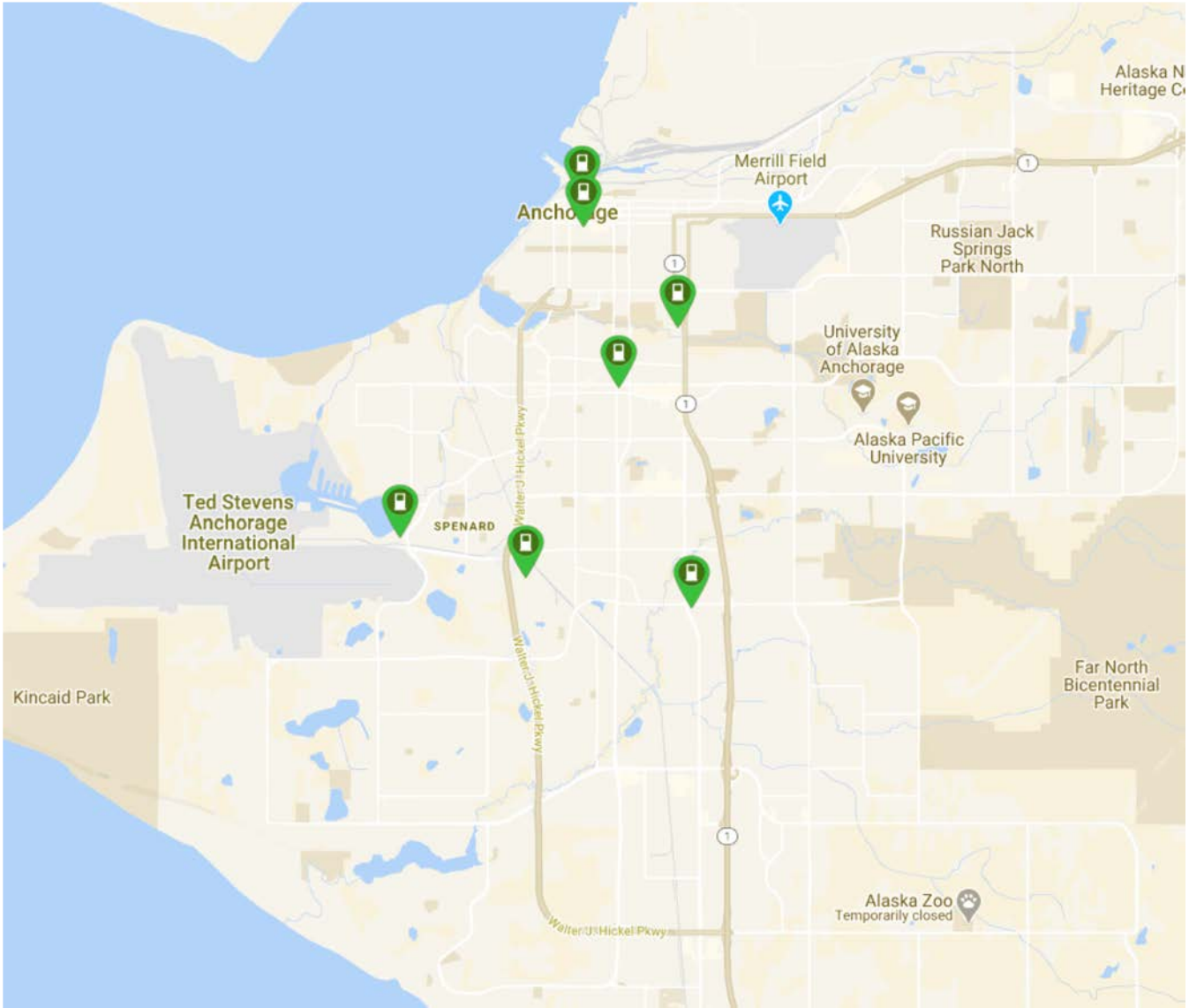
#3: Where do you charge?

- At home. 99.99% of time
- For longer range EVs, charging around Anchorage is never needed.
- 240V level 2 charging charges at ~30 miles of range/hour
- 115V outlet – 4 miles/hour

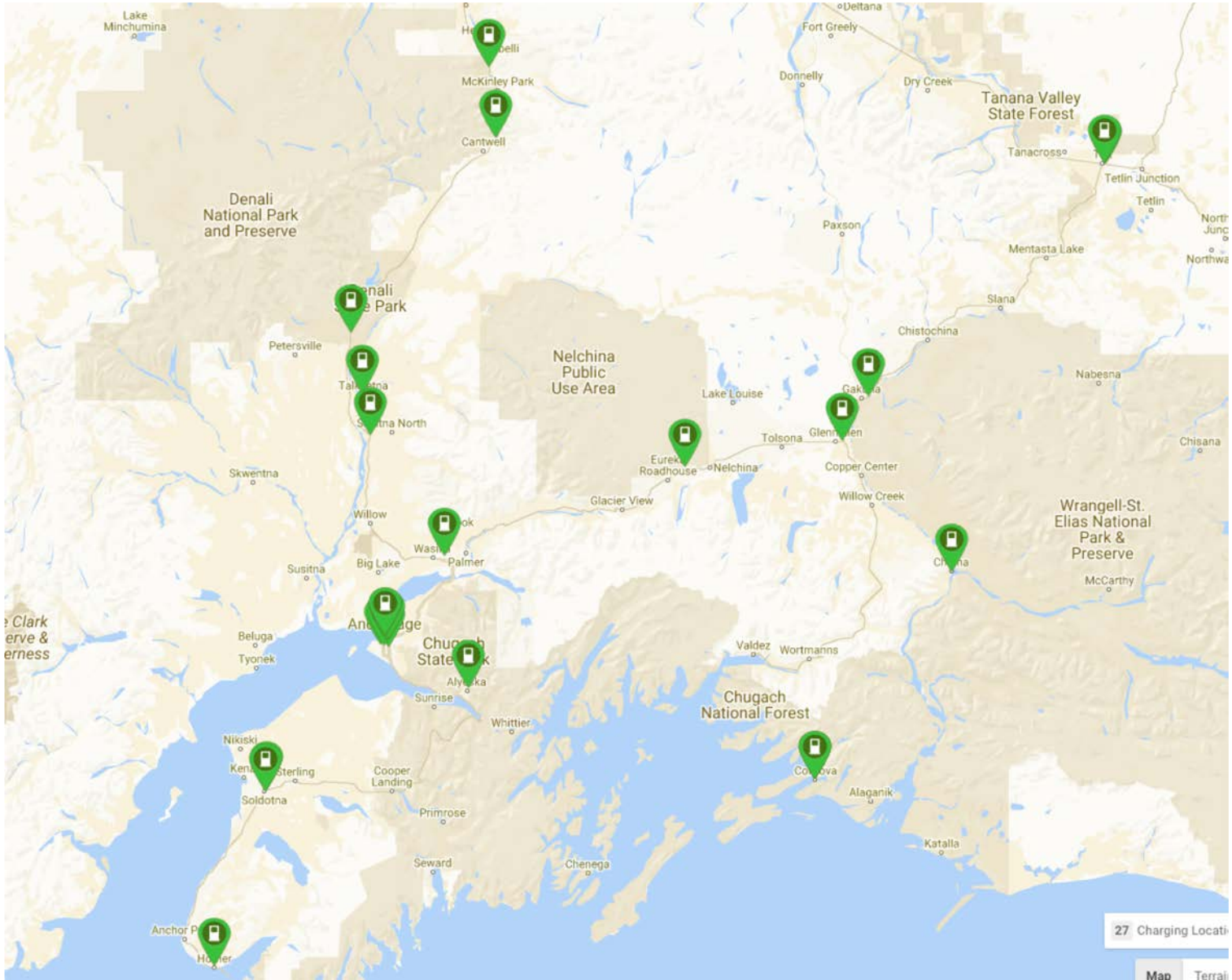
Charging – Anchorage 2018



Charging – Anchorage 2020



Charging - Southcentral



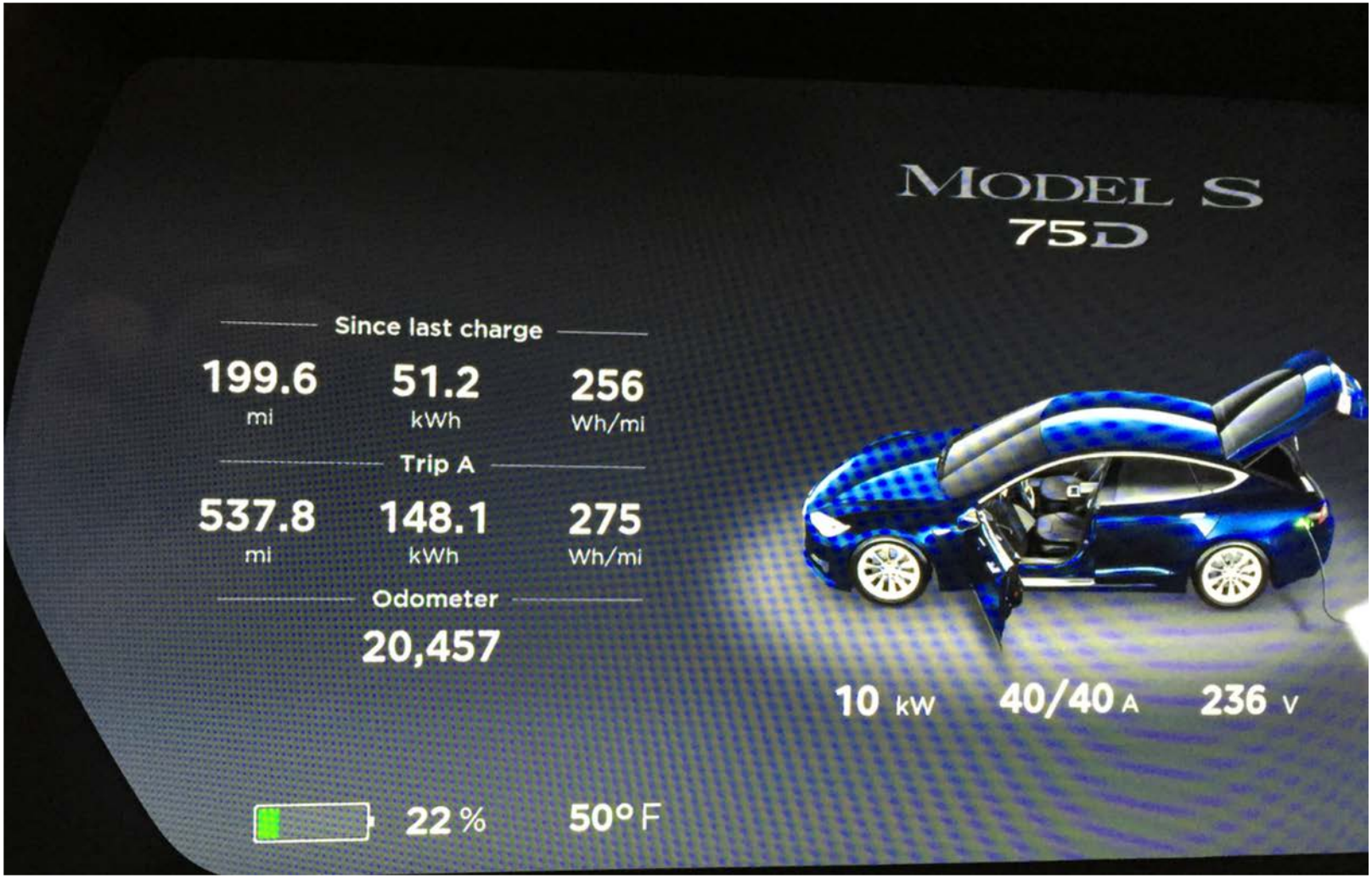
#4: How about Range Anxiety

Range Anxiety

- Concern that the battery will go flat before you reach your destination.
- Due to few charging stations.
- Not generally a concern during daily driving; (unless you forgot to plug in ☹).
- Diminishes as you learn how far you can go under different conditions.
- Will go away when chargers are as common as gas stations.

Road Trip to Homer

Denali to Eagle River

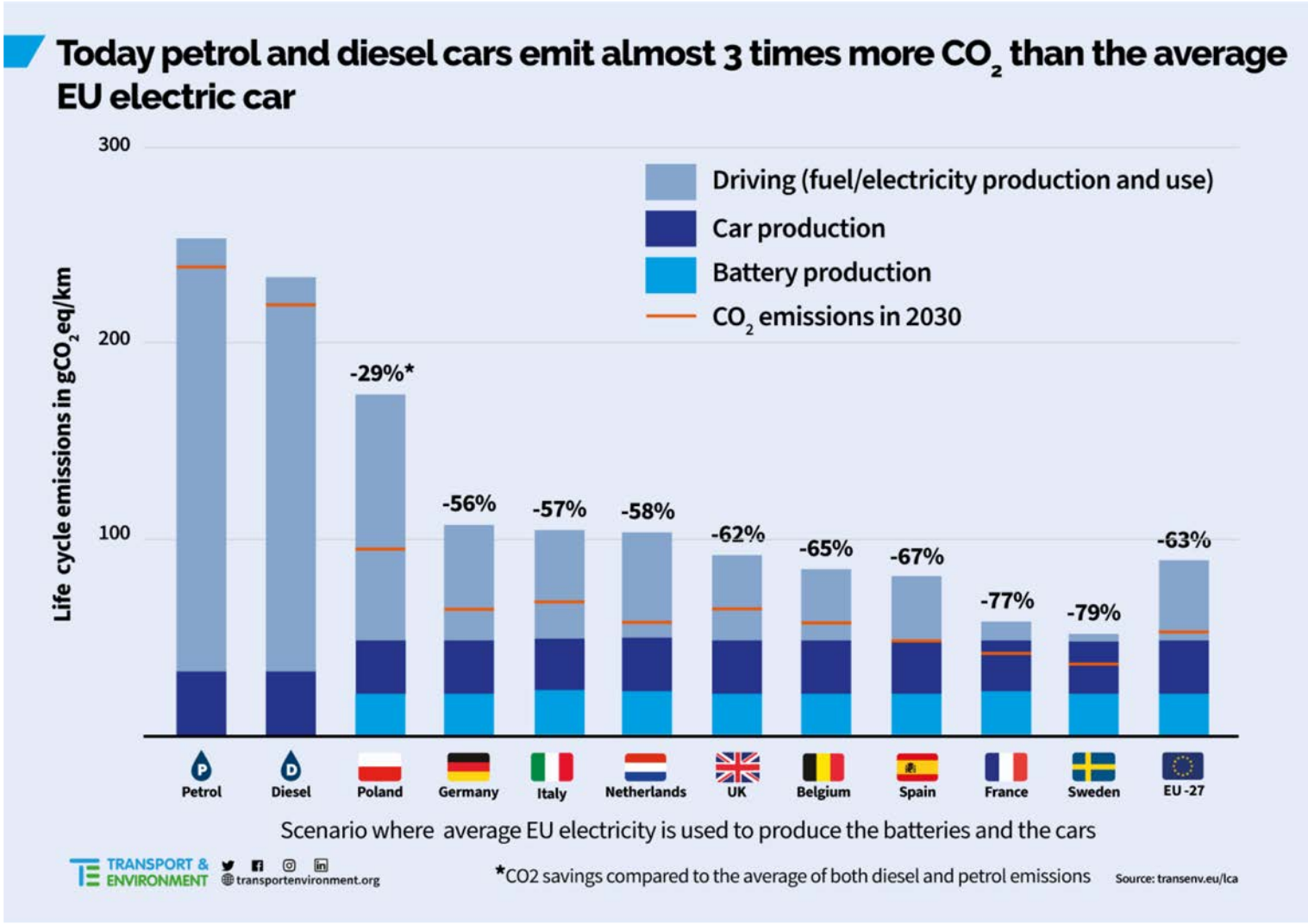


Adventure Denali Charging

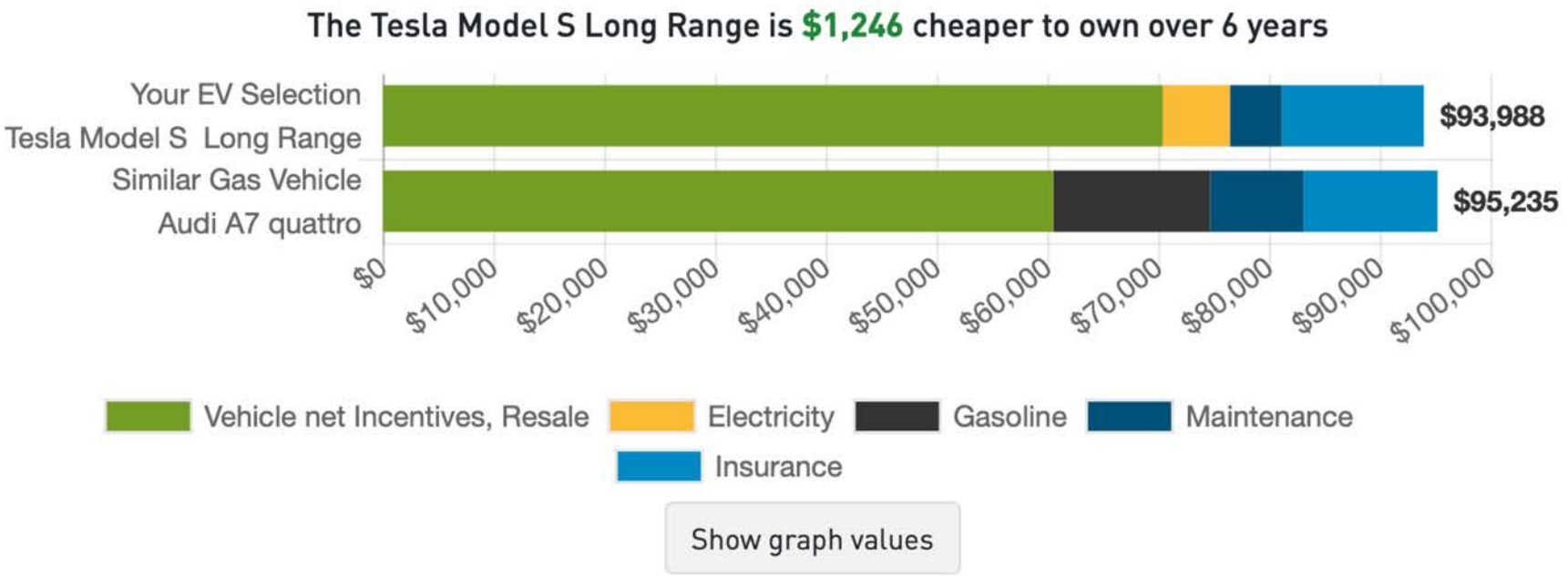
Why an EV in AK ?

- Maintenance Costs
  - 2¢/mile ICV vs. 0.6¢/mile EV
  - If time is money…. I love NOT going to the gas station!
  - Just hit 62,000 miles. Oil change? What oil change?
- Operating Cost
  - 10-25¢/mile for ICV vs 4-6¢/mile for EV
- Comfortable and safe driving in winter
- EV ownership reduces electricity rates for everyone.
- Superior driving experience.
- Reduced or zero CO2 emissions.

CO2 Emissions



Cost of Ownership



Maintenance

Cabin Air Filter
Your Tesla is equipped with an air filter that prevents pollen, industrial fallout, road dust and other particles from entering through the vents. Tesla recommends replacing your cabin air filter every 2 years.

High Efficiency Particulate Air (HEPA) Filter
If your Tesla is equipped with a HEPA filter, Tesla recommends replacing it every 3 years.

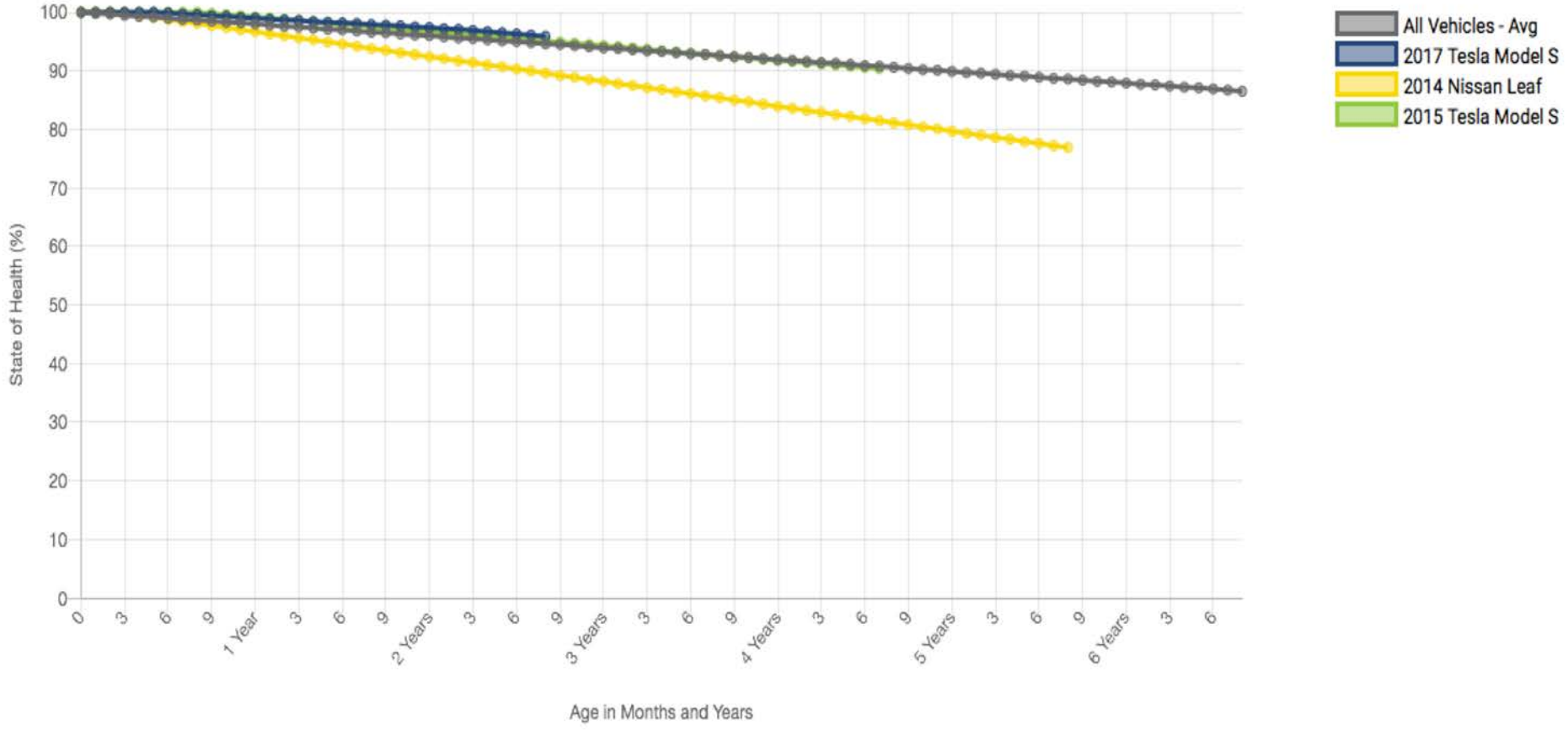
Tire Rotation, Balance and Wheel Alignment
Tesla recommends checking your tires every 10,000-12,000 miles for rotating, balancing and aligning needs. Aggressive driving can lead to premature tire wear and may require more frequent tire service. Unbalanced and misaligned wheels affect handling, tire life and steering components. Refer to tire manufacturer's owner manuals and warranty documentation for additional details.

Brake Fluid Test
Tesla recommends testing brake fluid for contamination every 2 years and replacing as needed.

Air Conditioning Service
An air conditioning service replaces the desiccant to help the longevity and efficiency of the air conditioning system. Tesla recommends an air conditioning service every 2 years for Model S, every 4 years for Model X and every 6 years for Model 3.

Winter Care
Tesla recommends cleaning and lubricating all brake calipers every 12 months or 12,500 mi for cars in cold weather regions.

Battery Degradation



Vehicle to Grid

- Use EV battery for grid power storage
- Routine usage or emergency power
- Routine usage not needed unless time-of-use electric rates are in place
  - Expensive, optimized vehicle battery would degrade faster
  - Competes with Teslas residential battery
- Emergency backup power
  - No technical reason it couldn’t work
  - Require control system to backfeed power along with inverter to create AC power

Industry Trends

- Charging Speeds
  - Latest Tesla V3 Supercharger. 75 miles of range in 5 minutes. 180 miles of range in 15 minutes.
- Range
  - Current Tesla Model S 340 or 390 mile range
- Costs
  - Tesla Model 3: 250 mile range. $39K
  - Chevy Bolt: 260 mile range. $37K