The following people have asked you to be their transportation adviser. Your job is to write a brief transportation plan for each person, in which you tell them how they can best meet their stated goals. As savvy transportation consumers, they won’t just take your word for it: you’ll need to show them numbers to back up your advice.

If it helps, in designing each plan, you are allowed to use multiple different technologies—the only requirement is that each technology you recommend must be commercially available to the person you’re advising, today.

This is an open-ended assignment, meaning that there is no single correct answer to these questions. However, some answers will definitely be more or less correct than others (i.e., if you suggest driving a Hummer, you’ll probably be wrong). Those of you whose answers are the most complete and/or creative will set the curve by which everyone else’s answers are graded.

If you need to assume more than is provided in the scenario—and you probably will—simply find a source that helps you make a reasonable assumption and cite it.

**Scenario 1:** Claire lives in Seattle. Like the average driver, she drives approximately 33 miles per day. (To simplify your calculations, you can assume that she drives exactly 33 miles each day.) She likes to lease her cars, and has only one concern: keeping her monthly costs low. Her employer recently put in an electric vehicle charging station that is free for her to use. She’s intrigued by the possibility of paying $0 for fuel, but doesn’t know whether this will actually save her money. Based on monthly cost alone (effective lease price plus current fuel costs), what make and model of car should Claire lease?

*Sensitivity Analysis*

While Claire currently drives an average of 33 miles per day, it’s possible that, in the future, she will drive more or less. At current fuel costs, will your answer change if she drives more or less? For what range of average miles per day (e.g., “10 to 50 miles per day”) does your answer hold true, and what should Claire do if she find herself regularly going outside of this range (at either end)?

Similarly, it’s not only likely, but guaranteed, that fuel costs will fluctuate. For what range of fuel costs does your answer hold true, and what should Claire do if fuel costs regularly go outside this range (at either end)? Based on fuel cost trends in Seattle, how likely do you think this is? Finally, while Claire’s boss is providing free electricity for now, it's possible that he’ll charge for it in the future. At what price per kWh of electricity would your answer change (if any)?

**Scenario 2:** Per lives in Mountain View and works as a professor at Stanford University. He wants your advice on what car he should buy next. He wants to buy an electric car, but he’s not sure this is possible within his constraints:

* + His daily commute is 8 miles one-way. On the weekends, he drives 30 miles per day.
  + Twice a year, he takes a long-distance road trip: 1) to Tahoe, and 2) to Ashland, OR.
  + Once a month, he flies out of SFO. He likes to drive himself to the airport and park there.
  + He likes to own his cars (vs. leasing), but refuses to pay more than $40,000 to buy one.
  + More importantly, he refuses to pay any amount of money for a car that is “ugly” (you can use your own judgment on how to interpret this).

What kind of car should Per buy and why? If he follows your plan, what will the upfront and yearly costs of his transportation be (based on the trips listed above, not including his airfare)?

**Scenario 3:** Tyler lives in Fort Collins, Colorado. Working in construction, he needs to drive a big truck, which uses quite a bit of fuel. But Tyler is a major fan of the outdoors, and still wants to do his part for the environment. Unfortunately, his family makes this difficult, as they are spread around the country: his parents live in Atlanta, GA; his sister in Austin, TX; his grandmother in Bartlesville, OK; and his other grandparents in Snowflake, AZ. He wants to visit each of these places once a year, but he wants to do it in the way that will have the least impact on the environment (note: he wants to physically visit, not just use FaceTime). He’s willing to spend a bit more time in transit, and a bit more money, if doing either of these things will help, but he’s not quite crazy enough to walk or bike. (He’s also aware of the option to use carbon offsets, but he’ll feel much better if he can reduce his own emissions as much as possible first.) What mode(s) of transportation should Tyler use to visit his family? And how much CO2 will he emit in the process?