Generating trip recommendations

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Recommending more eco-friendly trips based on a user's travel data

Problem

While we've implemented the instrumentation to collect travel data, a user's motivation to confirm trips drops after three weeks. Applications that simply collect and display a user's information are unlikely to spur durable changes in their habits. We believe the lack of insight into how a user can improve their footprint is an important contributor to a lack of user participation and change towards sustainable transportation behavior.

Motivation

Our goal is to extract insight from a user's travel data and recommend an alternate trip that is feasible, desired, and more environmentally friendly.

Design

We divided the pipeline into three parts. The Alternative Trips pipeline gets the space of trips (alternate trips) the user possibly considered when deciding to make a trip. We query from both Google Maps and Open Trip Planner to get a rich set of modalities considered for the alternates (bike, walk, car, etc.). The Utility Model pipeline infers a utility model for each user based on the choice they made (actual trip taken) given their options (alternate trips for this trip). Finally, the Recommendation pipeline queries for a canonical user trip, queries for the larger space of alternates (includes perturbations of time), and includes a **modified utility model** representing a similar user who cares about environmentally friendly trips.

Legend:

|			
🟥	Air	🟨	Subway
🟦	Bicycle	🟩	Rail
🟧	Driving	🟩	Walking
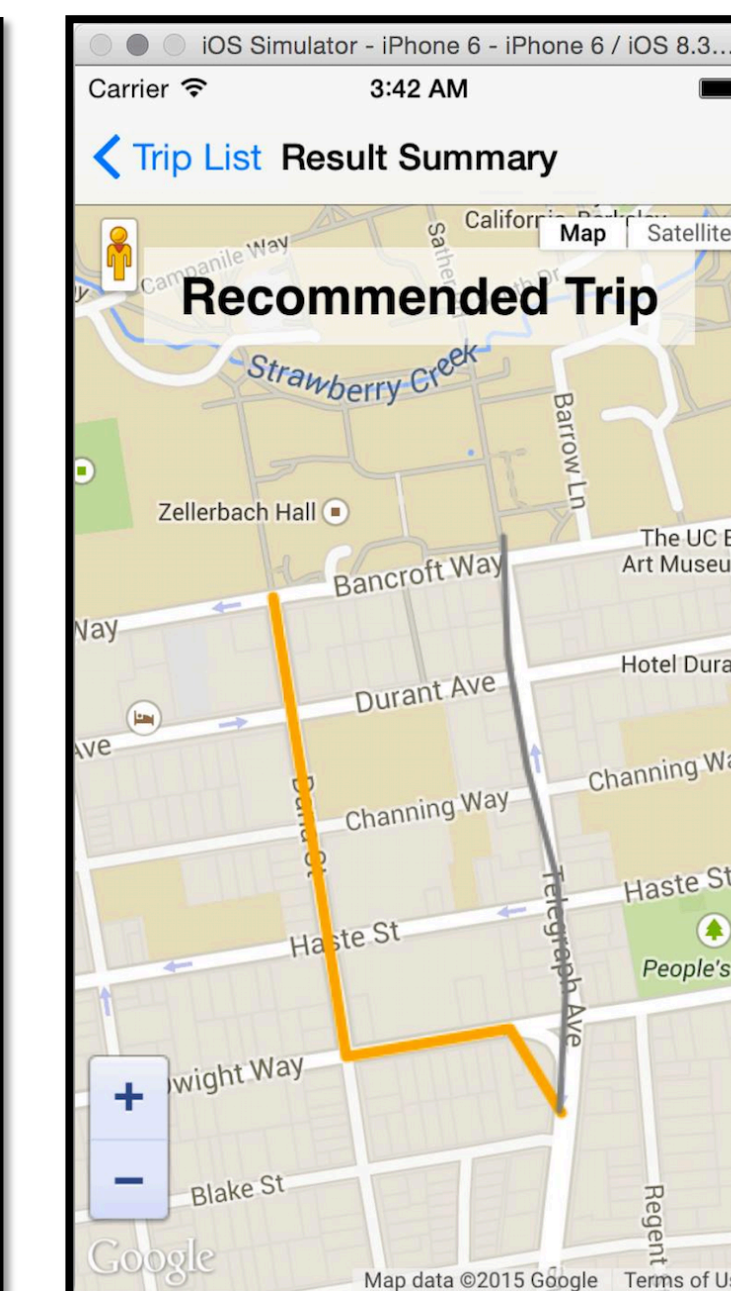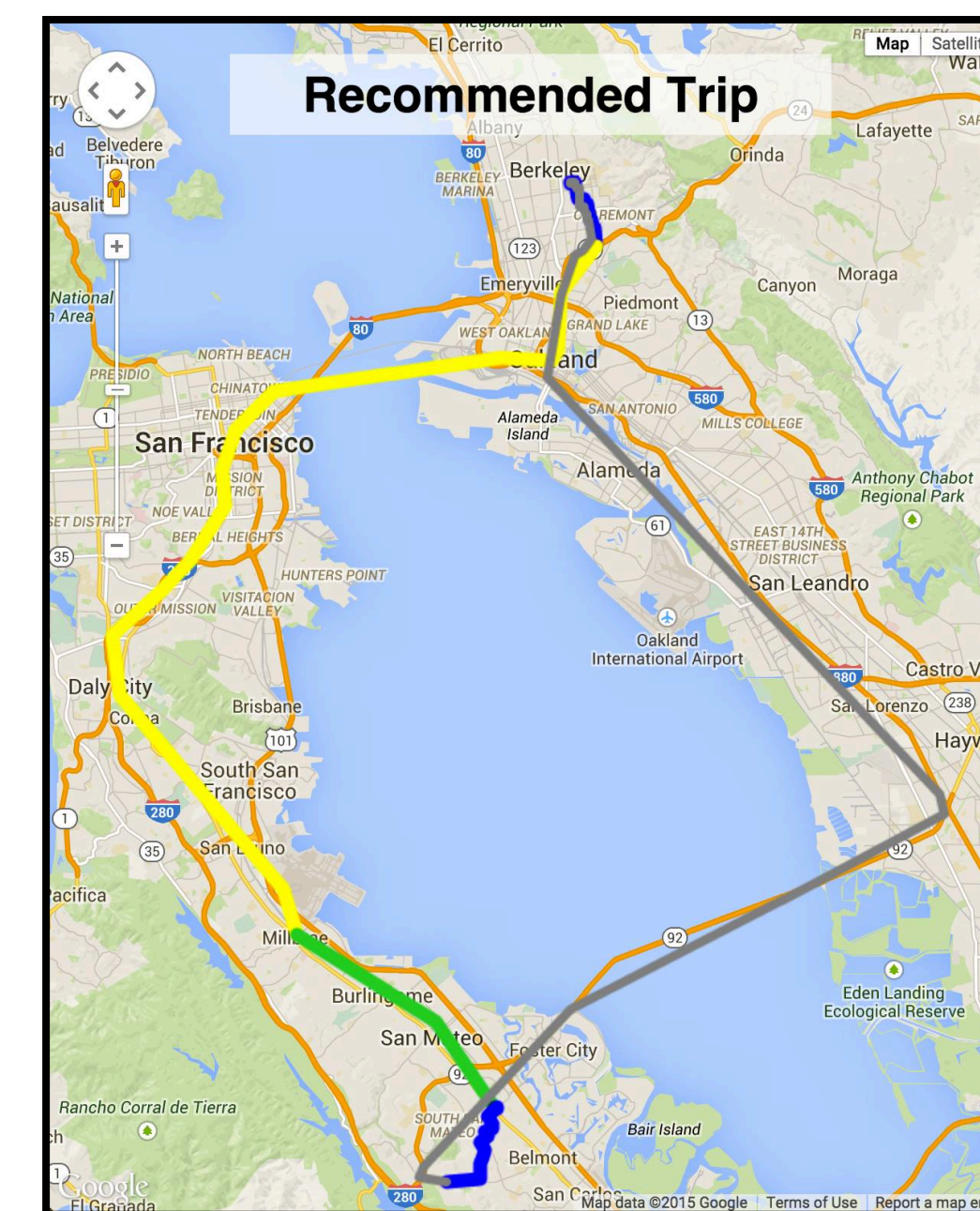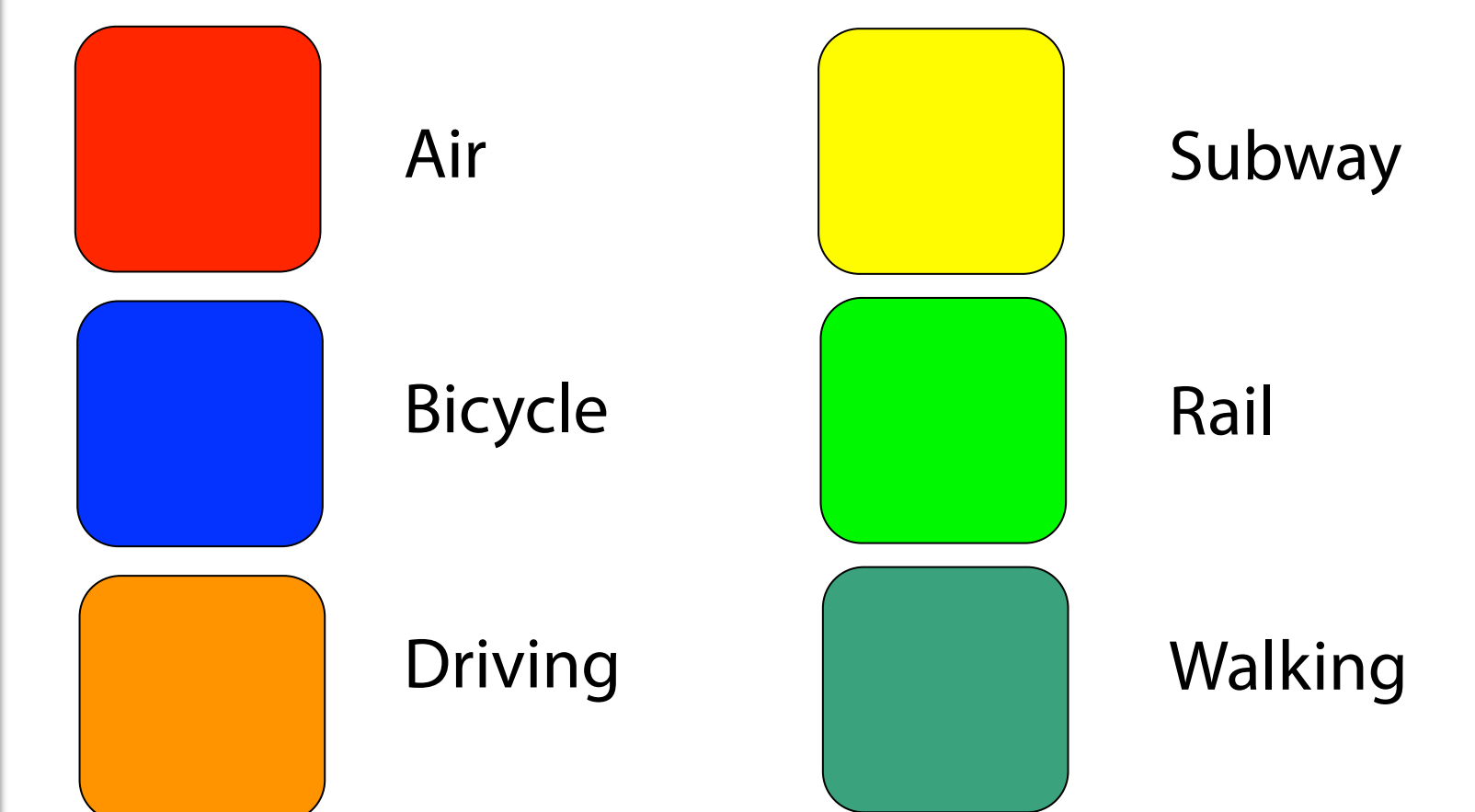
Here is our initial iteration of the recommendation display. We present the user's original trip and a potential alternate that is feasible, desired, and more environmentally friendly to the user.

Important Modules:

- Alternate Trip Module: We can query trips from any API of our choice i.e. our integration with Open Trip Planner as a replacement for Google Maps

- Utility Model Module: We can experiment with multiple user models and continually modify our feature extraction for each user.

Pipeline Diagram
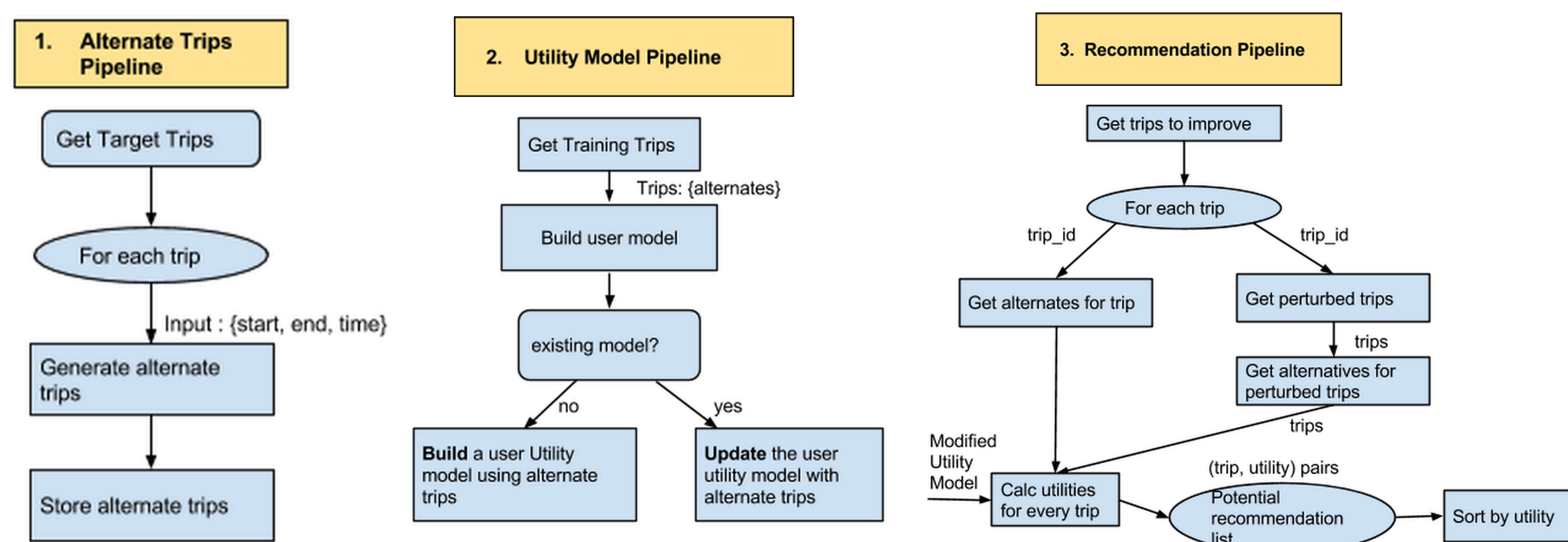
Future Work

Now that we have a working recommendation platform, we can experiment with different implementations of each module.

In the near future, we would like to experiment with different utility models and introduce a better UI to interact with the recommendation.

We would also like to add social data and understand how travel groups such as friends or coworkers form and influence one's travel patterns.