A Real-time Data Dashboard for Monitoring Travel Behavior

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Introduction

- Travel monitoring studies need ways to keep track of participants. Study deployers want to know when their participants stop recording data so they can address the issue.
- Emdash is a mobility dashboard for such tracking. It allowed one administrator to support a travel study with 80 participants, which often requires more staff.
- It uses data recorded with a phone app involving the OpenPATH platform, formerly known as e-mission.
- Emdash is currently used for a two-year pilot study called CanBikeCO with OpenPATH deployments in 6 Colorado locations.
- CanBikeCO gave electric bikes (e-bikes) to low-income workers to see how their behavior changes with the e-bikes.

Objective: Provide travel behavior study deployers a means to easily monitor participants, detect data collection issues, and present data effectively.

Scalability

- Added a date range limit for which trips get displayed on the map. Gave the option to generate trajectories only when the user wanted them (Figure 3).
- Used fewer location points in the trajectories when the date range was larger, saving computing power.
- Made options configurable with a YAML file to tailor to different deployments.
- Some deployments wanted extra tables, like Bike Check In and Polar Bear.

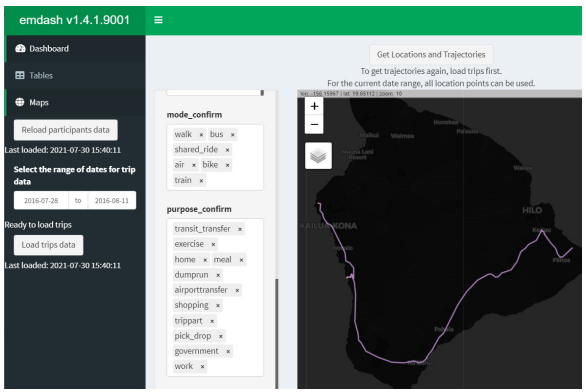

Figure 3: Screenshot of the map feature with the new 'Load trips data' and 'Get Locations and Trajectories' buttons

Dashboard Components

- Three tabs: Dashboard, Tables, and Maps.
- Dashboard Tab: brief data summaries - number of active users today, number of trips per day, a histogram of the number of days that participants have had the app.
- Tables Tab: Information about users or trips in table form (Figure 1), with each table linked to an interactive plot box (Figure 2). Deployers often use the participants tab to tell whether participants are still using the app.
- Maps Tab: Shows participant trajectories, with options to filter by user, mode, and more. A program deployer could look at how routes differ based on mode for a given user.

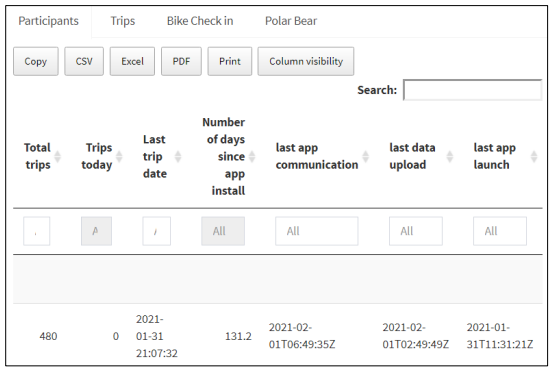

Figure 1: Screenshot of emdash's tables

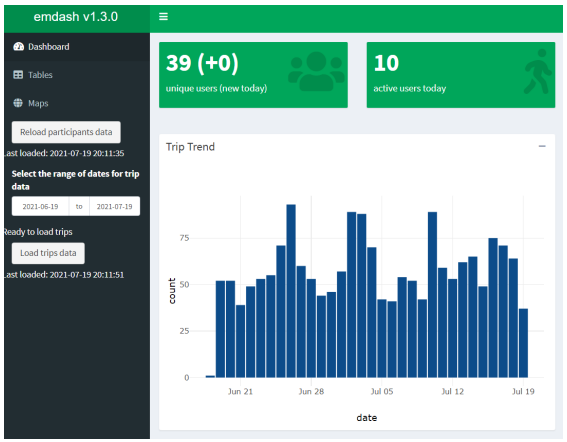

Figure 4: Screenshot of part of the dashboard tab

Figure 2: Screenshot of interactive plots feature

Conclusions and Future Work

- Deployers mostly use the tables to see who is labeling and who is not, and whether participants are using the app.
- Deployers can access detailed routes to see how they vary with trip mode.
- Deployers suggested including an energy and emissions component.
- Future additions:
  - Send push notifications from the dashboard to the app.
  - Use a model to automatically classify sources of participant data collection issues.

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