Future Mobility Sensing (FMS)

1. Opportunity
   1. Assist end user make accurate, real time, decisions regarding travel
   2. Generate individual behavior data for transport models
2. Significance
   1. Improve travel time
   2. Develop user driven mobile application
   3. Reduce user stress related to travel
   4. Potentially improve work place environment
3. Current Technologies
   1. Paper and pencil
   2. Web based
   3. Issues with current technologies
      1. Under-reporting of trips
      2. Inaccurate time
      3. Inaccurate location information
      4. High cost per survey
      5. Lack of detailed route information
4. FMS Technology
   1. Travel diary on smartphone (both iPhone and android)
   2. Smartphone device
      1. Wi-Fi
      2. GSM
      3. GPS
      4. Accelerometer
   3. Server Database
   4. User Interface (UI)
      1. Stop location
      2. Modes
      3. Activities
      4. Accompanying
5. Approach
   1. Automated travel survey
   2. Recruitment process for users/testers
      1. Age
      2. Gender
      3. Occupation
      4. Home location distribution as general population
   3. Compensation for users
      1. Free 3G data plan during survey (must be on par with user burden)
   4. Traditional Survey
      1. Household Interview Travel Survey (HITS): interview based survey where users were asked to recall their travel the previous day (1500 participants)
      2. Singapore by the Land Transport Authority (LTA)
      3. Incentive: free 3G data plan for one month
      4. Different types of travel: work, home, meal/eating
         1. Participants focused heavily on work (7-9AM) and home (6-8) and under reported meal/eating (excellent metric because eating out of the home is common in Singapore)
   5. FMS Survey
      1. 1514 initial participants, 793 participants completed process
      2. 2 weeks of data collection
      3. UI
         1. Main contact point with FMS was the activity diary interface
         2. Quantifying self versus filling out a survey
         3. Minimize clicks for user
         4. Tasks
            1. Confirming start and stop times
            2. Activity/mode
            3. Adding details regarding trip
   6. Results/Conclusion
      1. Improve battery performance would improve data quality
      2. Task is complex to communicate to all users
      3. Improvements
         1. For validation
            1. iBeacon on bus stops
            2. Smart meters in homes
            3. Wearable devices