"In the Moment" Travel Study
A GPS Smartphone Application

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What is rMove?
A GPS-enabled smartphone application, written for iOS and Android, aiming to capture all needed information for modern household travel diaries.

Has it been used?
Yes - rMove was recently tested in Indiana by 300 people. PSRC is piloting this week and Ohio DOT will pilot this fall.
Motivations for Developing rMove

Data quality and completeness:
- Reduce recall bias
- Much more likely to always have smartphone with you
- Ability to collect days (or weeks) of travel data

Reduction in participant burden:
- Faster and easier than completing paper, web, or phone surveys long after travel has finished.

Scalability and cost reduction for agencies:
- As app matures, incremental costs should be reduced allowing longer data collection periods and recruitment of more households.
Study Sponsor & Primary Study Goals

**Study Sponsors:**
- FHWA Office of Planning
- FHWA Office of Policy
- Madison County Council of Governments

**“In the Moment” Research Questions:**
- Will a smartphone method be a truly viable as a 100% replacement for traditional survey methods?
- Can we reliably collect GPS-based travel information via a low burden smartphone application?
- Will the resulting data be equal or better in quality?
Software Feature Set
rMove Store Listing: The Basics

- Support Website
- Android Store Listing
- Apple Store Listing
Underlying Technology (When & Where)

• Automatic trip start & end/stop detection
• Automatic recording of trip path & duration
• Multiple smartphone sensor utilization (GPS, compass, WiFi)
• Automatically runs in background & on device power-up
• Adaptive GPS collection technology to optimize battery life
Data Transfer & Communications

• Automatically encrypted transfer of data to server immediately after each trip is complete (assuming connection)
• Automatic monitoring of hardware – issues messages if GPS/WiFi turned off
• In-app messages indicating start and end of assigned data collection period
Trip Survey (Who, How, Why)

- Customizable in-app trip survey is triggered automatically by stop
- In-app survey has validation and real-time logic based on response
- Selection of which vehicle used and persons in HH on trip
- Ability to give feedback or report errors
Trip Survey: Expanded

Why did you stop here (at destination)?
- Went home
- Went to work/work-related
- Went to school/school-related
- Went shopping/ran errand(s)
- Grocery shopping
- Get gas
- Other shopping (e.g. mall)

Who was with you?
- Non household members with you?
  - 0
  - 1
  - 2
  - 3
  - 4
  - 5+

Household members with you? (SELECT ALL)
- Just me
- Adam

Travel mode(s)
- Why did you stop?
- Who was with you?

How did you travel? (SELECT ALL)
- Own vehicle (or motorcycle, moped)
- 2004 Xterra
- 2014 Kia Sorrento
- Other vehicle in my household
- Other vehicle (e.g. rental, carshare, taxi)
- Any bus (e.g. public, school)
- Walk/jog/wheelchair
Obtaining User Feedback

• General feedback button
• Error messages assist in correcting data with user’s input
• End of day “daily survey”
• Conducting follow-up survey this week
Trip Matching

- Trips will be matched to reduce respondent burden:
  - that have the same start and stop locations
  - trip distance
- Answers from matched trips are pre-populated so users can accept or change details for the trip
Conducting the Project
Methodology

- Recruited households also completed 2014 diary survey
- Asked to participate for 7 consecutive days
HH completed 2014 Study and volunteered for future surveys  

Spring 2014

HH invited to 2015 Study  

April 2015

HH takes 2015 Recruit Survey (updates HH info & smartphone ownership)  

April 2015

HH sent info on travel dates and instructions for downloading rMove app  

Tues 28 April–Mon 4 May

HH answers trip surveys on smartphone during assigned travel date period  

Tues 5 May–Mon 11 May

HH sent reminders to complete unanswered surveys & instructions to uninstall  

Tues 12 May–Fri 15 May
1771 households

1417 households

383 households (27% of invites)

288 households (20% of invites)

478 people

171 households (59%)

295 people (61%)
Preliminary Data Results

- ~12,500 trips
- ~8% of trips were “matched”
- 86% of people answered every single trip survey

- Very promising participation rates – especially for added value of 7 consecutive days
Areas to Keep Improving

• Android phones have wider range of quality, small subset get spurious trips
• Battery life is an issue for a small number of Android devices.
• Matched trips – review and hone to keep reducing burden
• Criteria for participation more complicated – what is a complete?
• Currently fielding in Seattle region – what are similarities and differences in results?
Next Up: Data Review & Looking Ahead

• Issuing follow-up survey(s) for feedback
• Preparing dataset and report
• Further improvements with broad applicability:
  – Household travel surveys
    • 3 to 7-day all travel
    • 3 to 12-month long distance travel
  – Special markets
    • University travel
    • Visitor travel
    • Transit, toll users
    • Commercial vehicles
Thanks to our Sponsoring Agencies

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