COMMUTE WARRIOR
ANDROID APPLICATION
FOR ACTIVITY TRACKING

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OVERVIEW

- Introduction
- Background
- Commute Warrior Android App
- Deployment
- Future work
INTRODUCTION

• Travel survey data
  • Traditionally done using travel diaries
  • New technology has led to more GPS data

• Longitudinal GPS travel data have a wealth of information
  • GPS devices can provide accurate and detailed spatial and temporal data
  • High-resolution GPS data are useful in studying travel behavior, driver behavior, safety, emissions, etc.
BACKGROUND

- Multiple studies show significant under-reporting for travel diary trips
- Commute Atlanta study diary vs GPS comparison
  - 29% of GPS vehicle trips were not reported in diaries
  - 5.9 trips/day/household (reported) vs. 8.4 (GPS)
  - Under-reporting of VMT by 22%
  - Under-reporting is not random
    - Short distance/duration, end-of-day, differences across demographics, etc.
TRAVEL DATA FROM GPS LOGGERS

• GPS data collection that require participant interaction will likely yield under-reporting

• 2013 study in UK and Australia with 19 participants, using GPS data loggers along with SenseCam (as ground truth) indicated that 21.5% of total trips were missed

• Passive travel data collection systems with minimal participant effort are needed
SMARTPHONE TRAVEL DATA COLLECTION SYSTEMS

• Nielsen 2013 data
  • 64% of US cell phone users have a smartphone
  • 80% of all new phone purchases are smartphones

• Smartphones have in-built GPS chipsets, processing power, and communications essential for data collections

• Smartphones are carried almost all the time

• Battery consumption is always a concern
SMARTPHONE SYSTEM OBJECTIVES

• Minimal user interaction
• Battery saving mode
• Ability to protect privacy
• Real-time, high-resolution data
• User-review of trips with functions that allow interactive capabilities to support submission of more detailed data
COMMUTE WARRIOR
ANDROID APPLICATION
COMMUTE WARRIOR

• Android App for personal cell phone tracking
• Monitors second-by-second phone location and speed
• Transmits real-time data to server via cellular
  • Settings for Wi-Fi only transmission if desired
• Integrates the functionality of previous vehicle monitoring systems, including travel diary reporting
• Runs in background with low battery power draw
COMMUTE WARRIOR
HOME SCREEN

• App runs in background
• Always on
• Can stop recording at any time (via menu) for privacy
• Commute Warrior Widget
  • Shows status (running)
  • Shows data collection and transmission activity
COMMUTE WARRIOR
LOGIN SCREEN

- Login required to record data, access data, view trips, and record travel diary data
- Account-Smartphone link
COMMUTE WARRIOR
MAIN INTERFACE

• Settings Menu (gear icon)
• Travel Journal
• Stop Recording
• Hide Window
  • Runs in background
  • Automatically restarts
COMMUTE WARRIOR SETTINGS

- Power options
  - Run only on A/C
  - Run on A/C or battery
- Set maximum battery drain
- Data via cellular, or Wi-Fi only
- Logout
- Stop recording and exit
COMMUTE WARRIOR
TRAVEL JOURNAL CALENDAR

• All days for which trip data were recorded appear in green
• Back/forward by month
• Dates link to trip journal
COMMUTE WARRIOR
TRIP VIEWER AND DIARY INTERFACE

• Daily record of all trips
• Date/time, duration, distance
• Map icon for trip playback
• Survey icon for trip purpose
  • Purpose data via App
COMMUTE WARRIOR
TRIP VIEWER

• For trip purpose recall
• Pan/zoom, center/auto-center, slider bar
• Green (start), red (end)
• Trip playback animation
  • Visualize trip speed and delays
COMMUTE WARRIOR TRAVEL DIARY
CUSTOMIZABLE TRIP DATA ENTRY

• Primary trip purpose and secondary activities
• Purpose-only for App entry
• Web interface supports long form diary with more complex nested options such as business types, route information, passengers, etc.
COMMUTE WARRIOR WEB INTERFACE
LONG FORM TRAVEL DIARY SURVEY
COMMUTE WARRIOR
TRAVEL DIARY SURVEY REQUESTS

• Researchers can request that users complete travel diary entries for any desired dates
  • Special events
  • Interesting data event identified by analysts
• Server can be programmed to issue diary-day requests
  • Regular (e.g., Mondays)
  • Random (e.g., 7x/month)
ONGOING DEPLOYMENT EFFORTS

• Beta Testing: School of Civil and Environmental Engineering, Georgia Institute of Technology; target 40 participants

• Initial Field Deployment: target 80 participants

• Deployment Partners
  • Georgia Regional Transportation Authority (GRTA)
    • Xpress bus rider newsletter
    • GRTA blog site
  • State Road and Tollway Authority (SRTA)
PARTICIPATION

• Anyone can participate
  • http://transportation.ce.gatech.edu/commutewarrior

• Contact us:
  • commutewarrior@ce.gatech.edu
SUMMARY

• App collects travel data with minimal interaction
• App has marginal impact on smartphone battery life
• App is efficient in collecting all modes of travel
• Since January 1, 2014
  • More than 4300 trips monitored
  • More than 10,000 miles monitored
• Commute Warrior Android App available
  • Beta testing system via Google Groups
FUTURE WORK

• On Google Play Store in March 2014
• Deploy 200 units in Spring 2014
  • 1000+ participants in Summer/Fall 2014
  • I-85 HOT lane commutershed
• Add travel mode to the App survey
• Add health measures functionality to the App
• iOS version of the app forthcoming in June 2014
QUESTIONS?

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