



Mobile Maps Application for Field Surveys

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Overview

- Why do we need maps?
- Paper Problem
- Solution: Electronic maps
- Software Requirements
- COTS vs custom
- MobileMaps app
- Field Test



Why do we need Maps?

Maps support area household surveys

- Show location of sample dwelling units (SDUs)
- Assist with applying a frame supplementation procedures
 - Half-Open Interval
 - Check for Housing Units Missed (CHUM).
- Used to build field-enumerated (FE) frames – record address & location / DU in sampled area

Paper Problem

Hard copy maps use a lot of paper!

- 1 project: ~2 tons of maps / year
(not including materials destroyed in the field)
- Address-based sampling frames use large geographic areas as area sampling units - requires ># of maps / sampled area

Solution: Electronic Maps

Cost-efficient, state-of-the-art, and relevant in today's marketplace.

- Electronic maps are ubiquitous
- Viewed on any device (tablet, phone) or computer
- Provide better oversight of field work, improved data quality

Software Requirements

- Low/No “per device” software cost
- User-friendly interface
- Full featured off-line capabilities
- Load custom generated maps
- Consume maps from an automated workflow
- Show current location on map
- Draw point features (i.e., dwelling units)
- Draw line features (i.e., missing roads)
- Save and export new data
- Link image(s) with a dwelling unit

Commercial off-the-shelf (COTS) apps

- TerraGo Applications (Publisher and Mobile)
- PDF Maps (Avenza Systems)
- SODA (Techneos)
- Google Earth
- Other (asset management software, ESRI software kit, Collector for ArcGIS, Mappt, GIS2go)
- Rapidly changing - products improving & new app available frequently

COTS vs requirements

Requirement	TerraGo	PDF Maps	SODA	Google Earth
Runs on tablet	√ (Android only)	√ (IOS only)	√	√
Read RTI-generated maps	√	√	X	√
Show current location	√	√	X	√
Add point feature	√	√	√	X
Add line feature	√	√ (no polygons)	X	X
Save and export data	√	√	X	X
Link a photo	√	√	X	X

COTS vs requirements (continued)

Requirement	TerraGo	PDF Maps	SODA	Google Earth
Doesn't require a license	√	√	X	√
Has a simple interface	X	√	?	√
Consumes maps generated by automated workflow	X	√	X	√
Customizable	w/contract	X	w/contract	X
Operates under a disconnected environment	√	√	√	X

MobileMaps

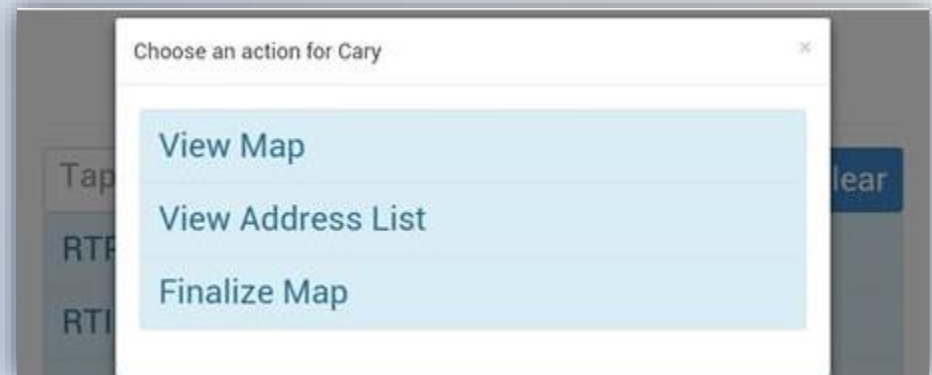
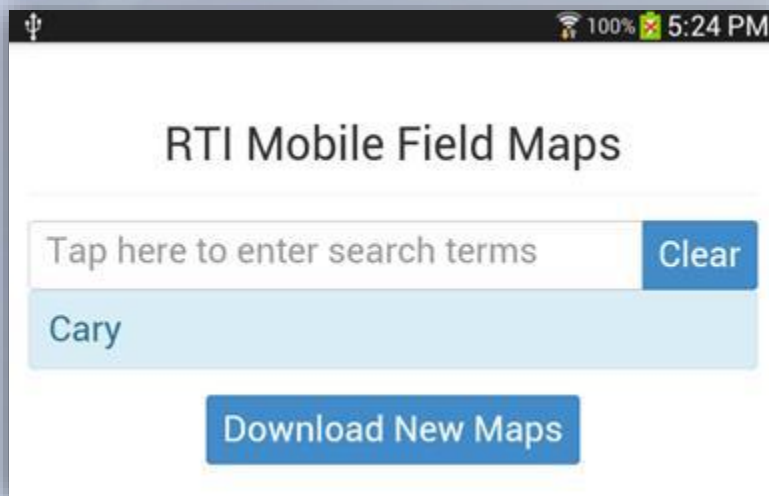
- Cross-platform app, built using open source software



PhoneGap



- Simple User-interface



MobileMaps Features

- Wireless data transmission
 - Consumes custom maps (ArcGIS)

The image displays three overlapping screenshots of the MobileMaps application interface, illustrating the process of downloading maps.

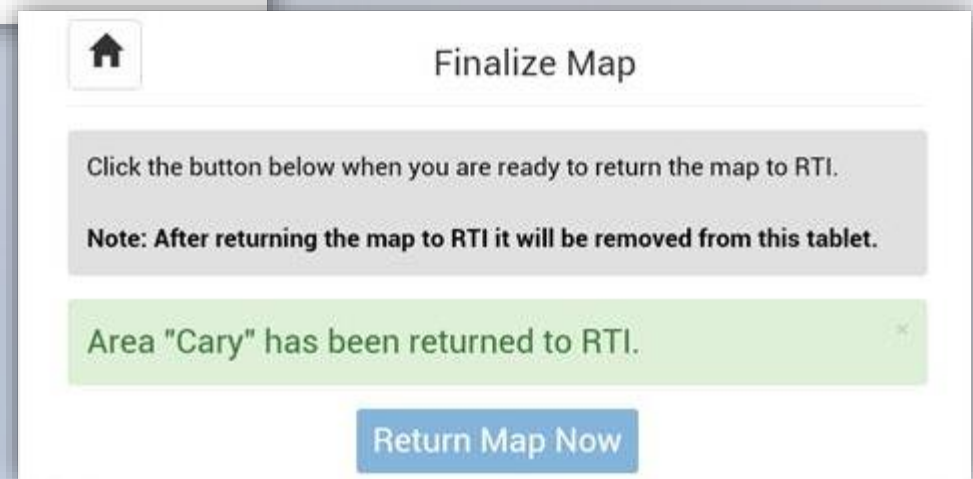
Top Left Screenshot: Shows the "Download New Maps" screen. A home icon is in the top left. Below the title, there is a grey instruction box: "Please select or enter the identifier for the area of interest, then tap 'Download Map' button below." Below this is a search bar with the text "Area ID of the area you want to download". The search bar contains two entries: "Greensboro" and "Cary". A blue "Download Map" button is at the bottom right.

Top Right Screenshot: Shows a "Loading map tiles..." dialog box. It features a home icon and a progress bar indicating 17% completion.

Bottom Screenshot: Shows the "Download New Maps" screen after a successful download. A green confirmation message states: "Maps for area 'Cary' have been downloaded." Below the message is a search bar containing "Cary" and a blue "Clear" button. Below the search bar are two entries: "Greensboro" and "Cary". A blue "Download Map" button is at the bottom right.

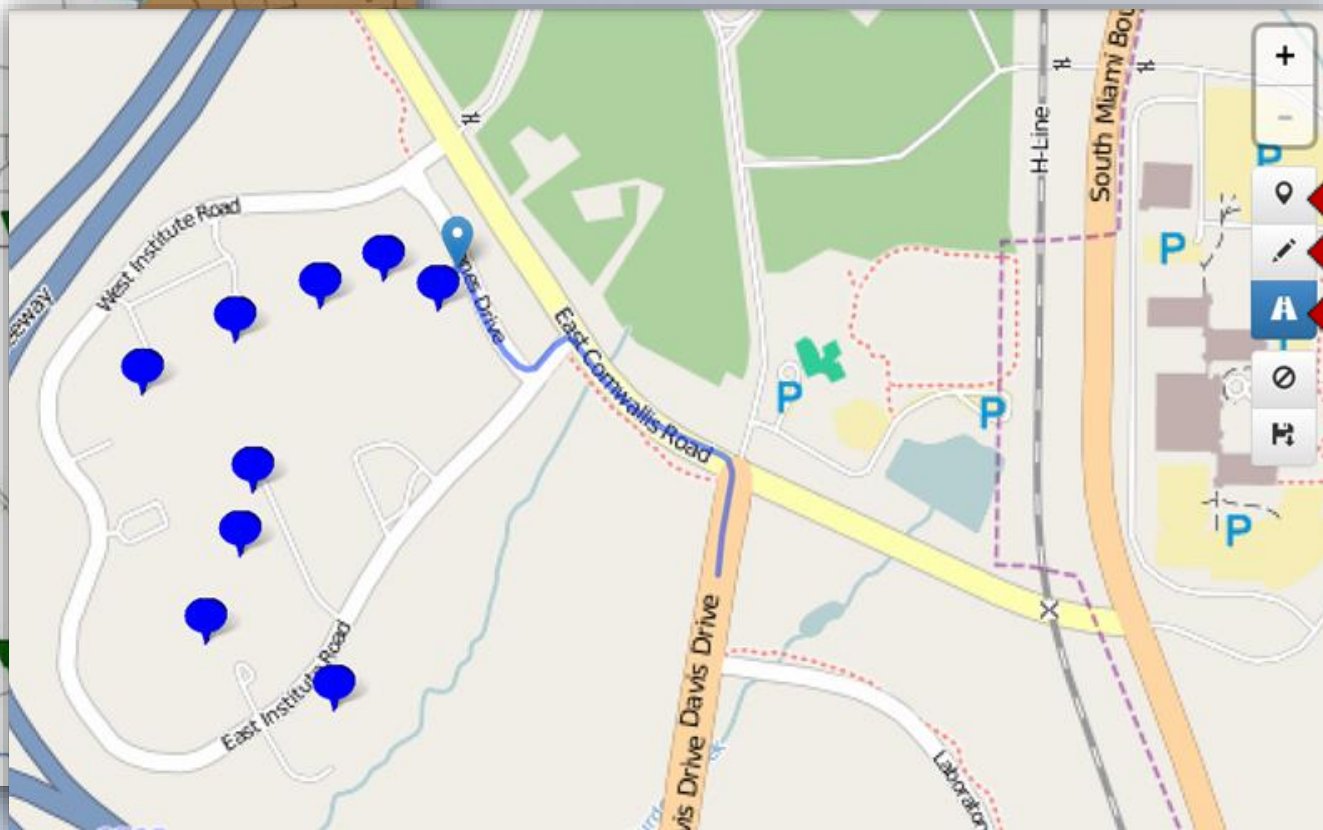
MobileMaps Features (continued)

- Save and export new data



MobileMaps Features (continued)

- Show SDUs, current location
- Add/remove point features
- Add/remove line features



1. Add Unit
2. Point-to-Point
3. Draw while moving

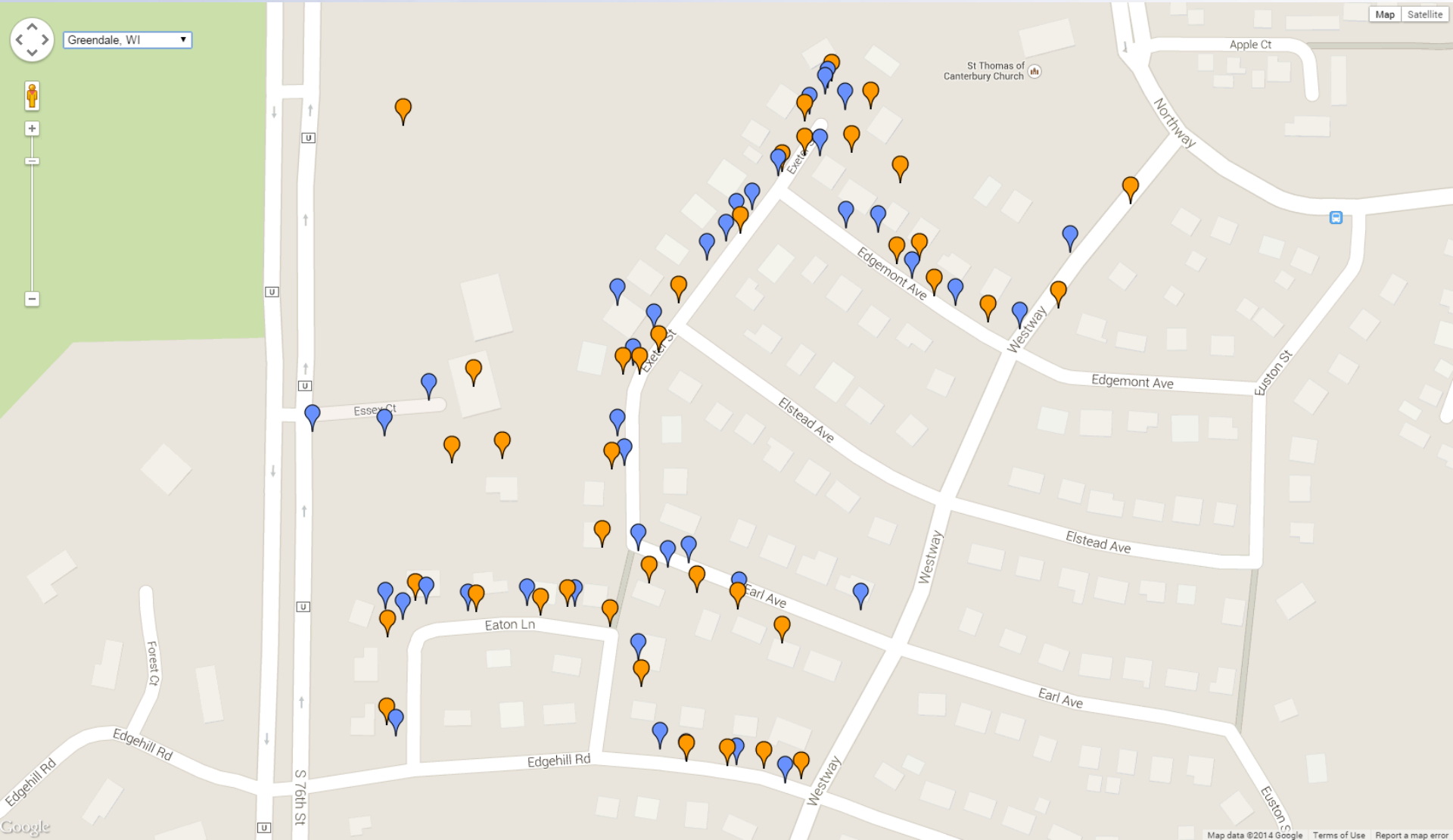
Field Test

- Assess MobileMaps usability
 - 8 staff enumerated DUs in two sampled areas
 - Samsung Galaxy 10” tablets
 - Overlap in area assignments; staff worked independently
 - Assignment represented rural and urban areas, and multi-unit structures
 - Usability calculated using System Usability Scale (SUS)
 - Debriefing session to gather feedback

Field Test Results

- SUS scores varied greatly
 - 32.5 - 87.5
 - 50% above average (>68)
 - Mean score of 61.25 was below average
- Generally positive feedback
- Most difficult: placement of point features
- Enhancements suggested:
 - Larger map extents (zoom)
 - Add point feature at current location

Field Test Results (continued)



More Information

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