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)

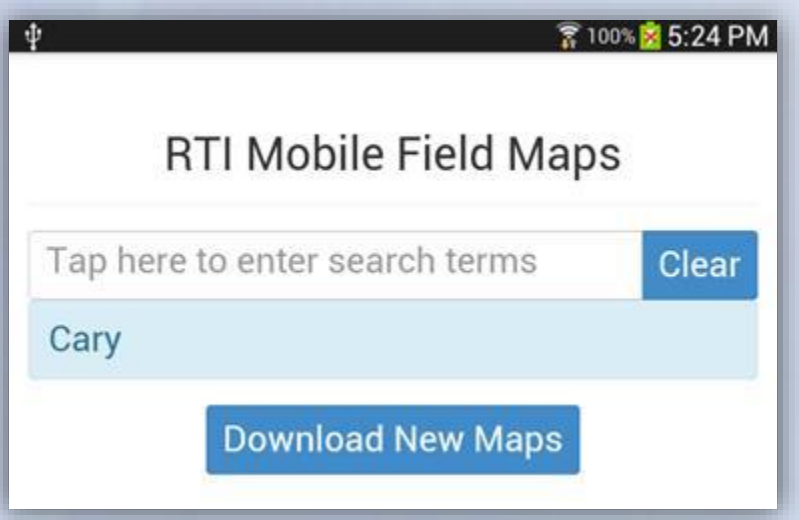
Requirement	TerraGo	PDF Maps	SODA	Google Earth
Doesn't require a license	√	√	X	√
Has a simple interface	X	√	?	√
Consumes maps generated by automated workflow	X	√	X	√
Customizable	w/contract	X	w/contract	X
Operates under a disconnected environment	√	√	√	X

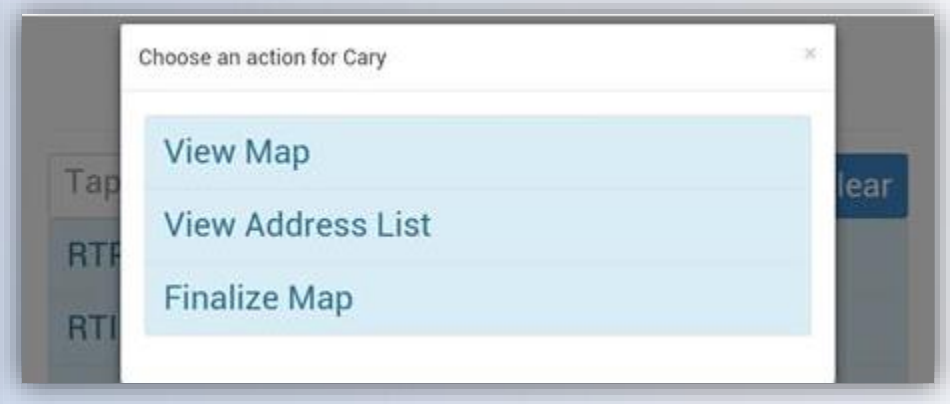
MobileMaps

- Cross-platform app, built using open source software

PhoneGap HTML CSS Bootstrap jQuery write less, do more. Leaflet

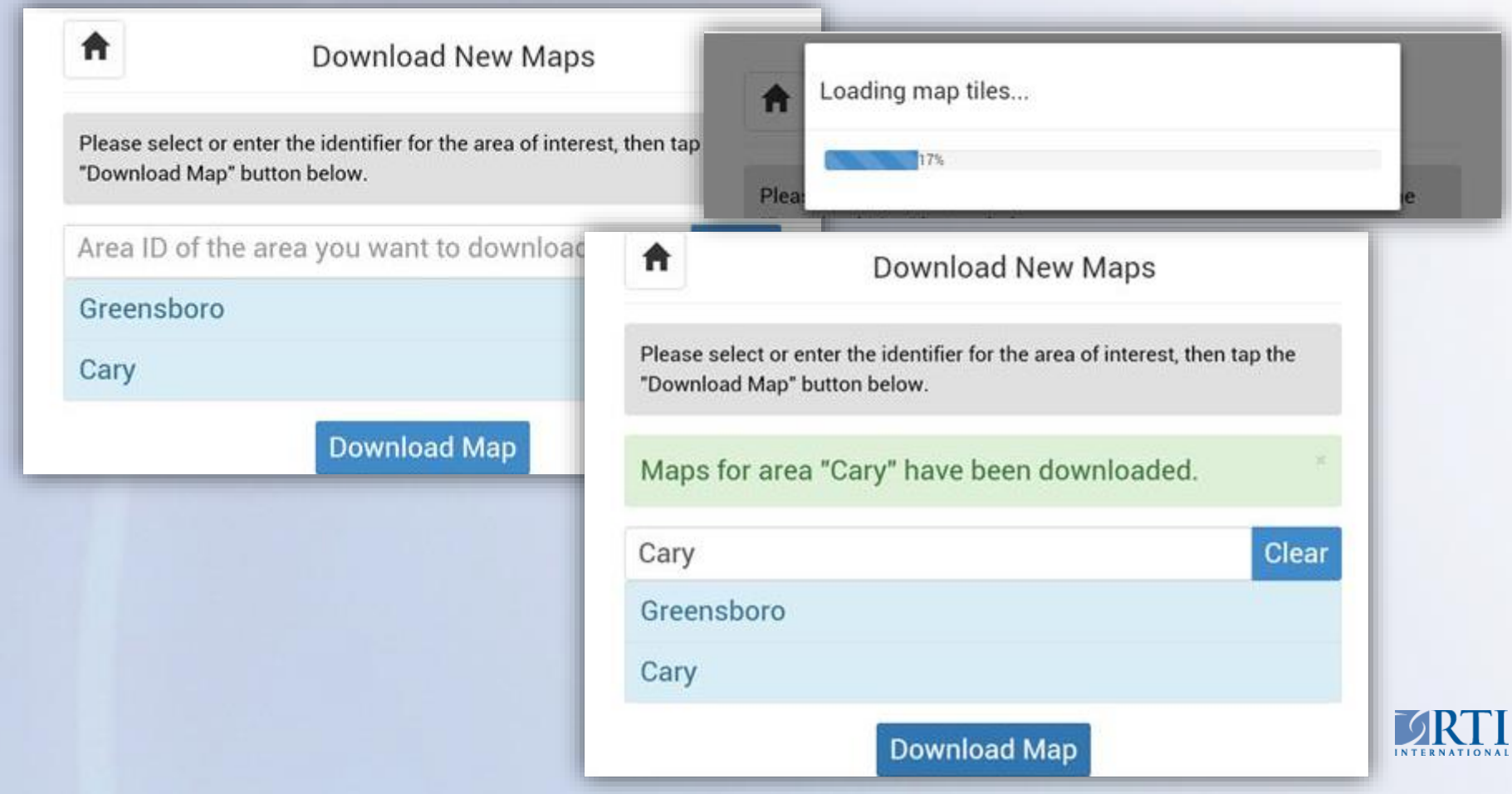
- Simple User-interface





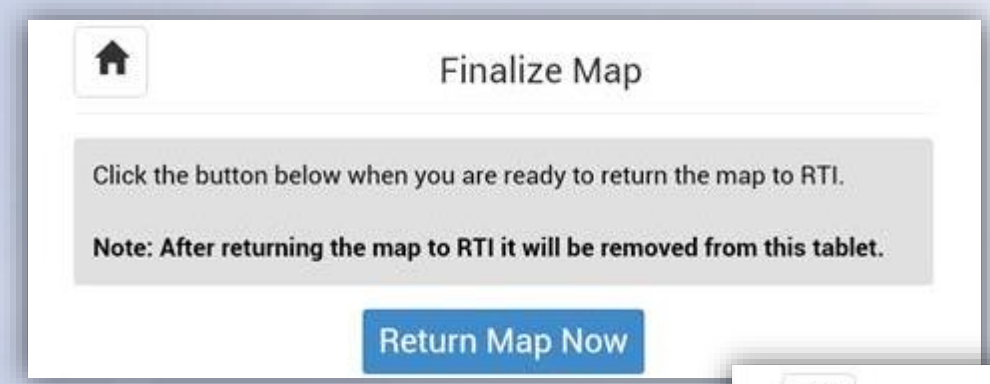
MobileMaps Features

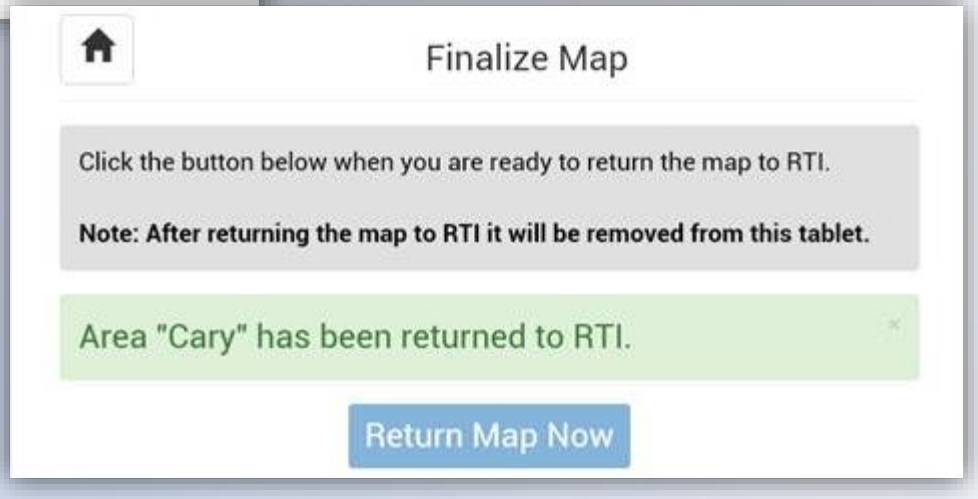
- Wireless data transmission
  - Consumes custom maps (ArcGIS)



MobileMaps Features (continued)

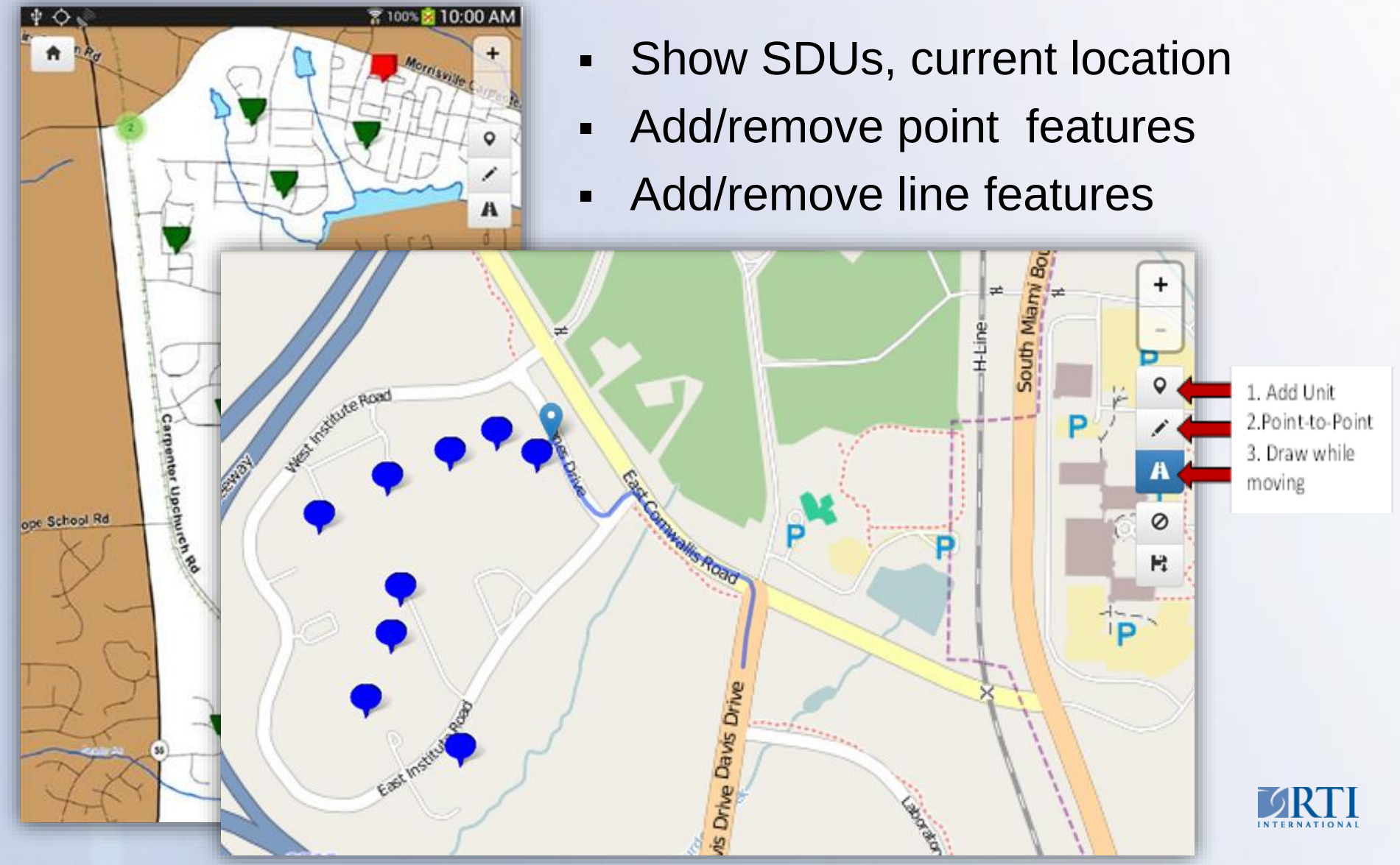
- Save and export new data





MobileMaps Features (continued)

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



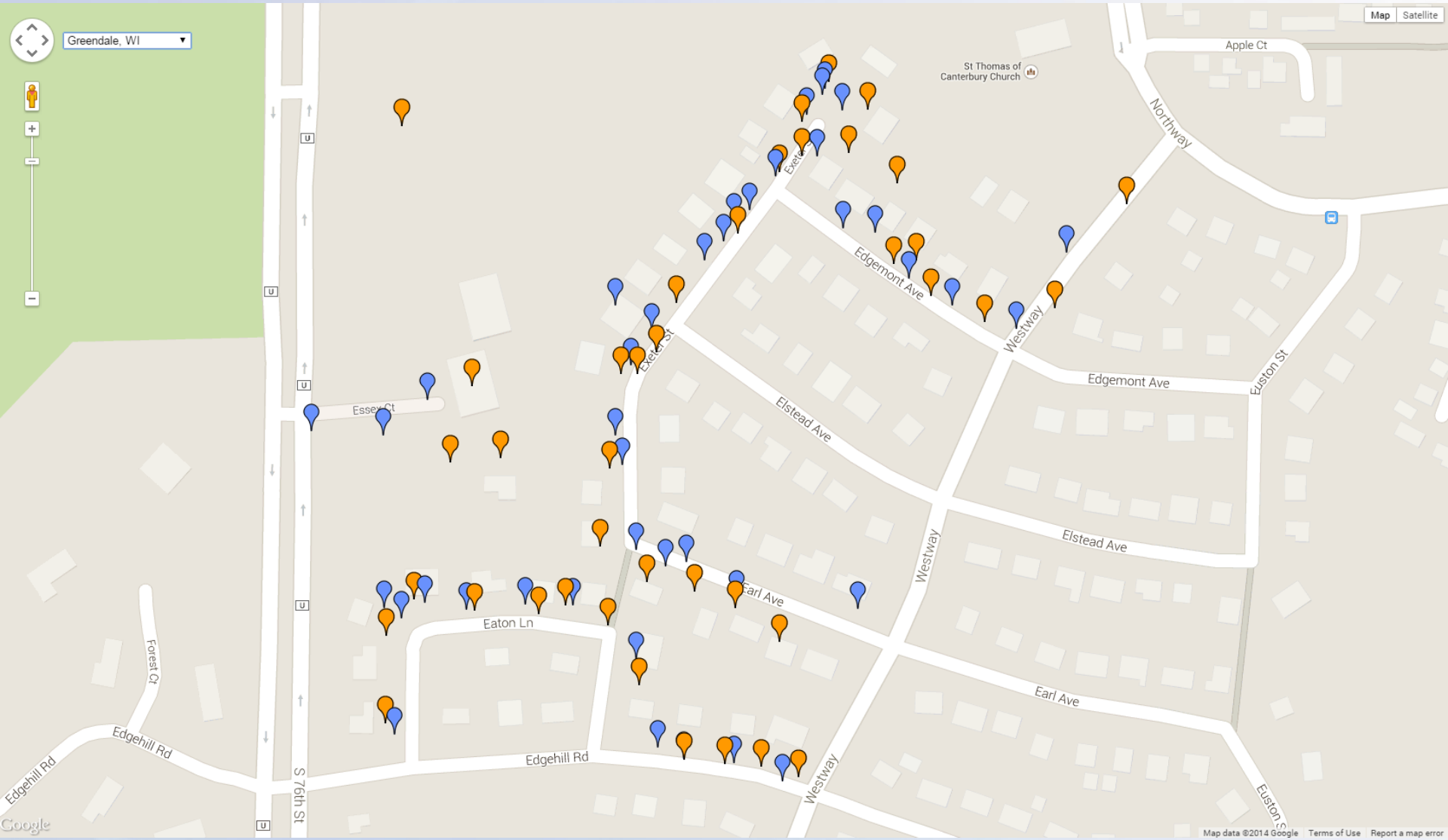
Field Test

- 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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