


UPGRADING DATA COLLECTION FOR THE MOBILE WORLD

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TxDOT TPP Mapping Group

- The Transportation Planning & Programming Division administers planning funds, prepares maps, collects data and programs projects.
- The Mapping Group is the central hub for TxDOT's GIS data systems. The group creates, maintains, analyzes, and publishes the GIS data utilized by the various TxDOT divisions and the public.
  - 73,000 on-system miles
  - 160,000 off-system miles (County Roads and Functionally Classified City Streets)
  - 3,000 federal miles
  - 69,000 local miles

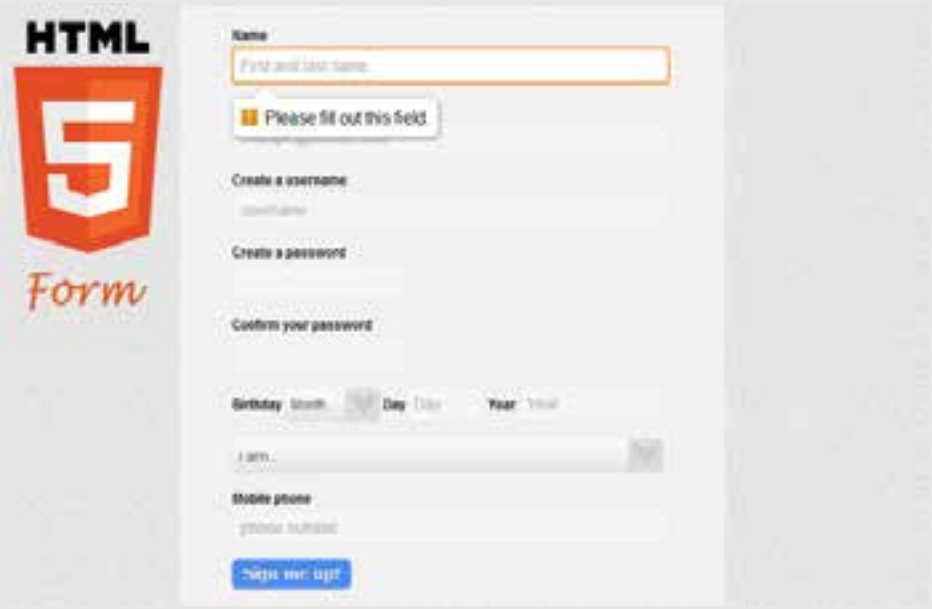
Current Data Collection Projects

Current Data Collection Projects

- Regional Data Collection effort utilizes man-power from local TxDOT District offices to collect data on a mass scale within a minimal time-frame effort
  - Juno SB Handheld with preloaded Data Dictionary
  - On-System Centerlines
  - Roadbed Realignments
  - Mile Markers (approx. every 2 miles)
  - Roadway termini and other point data

Application and Technical Specs

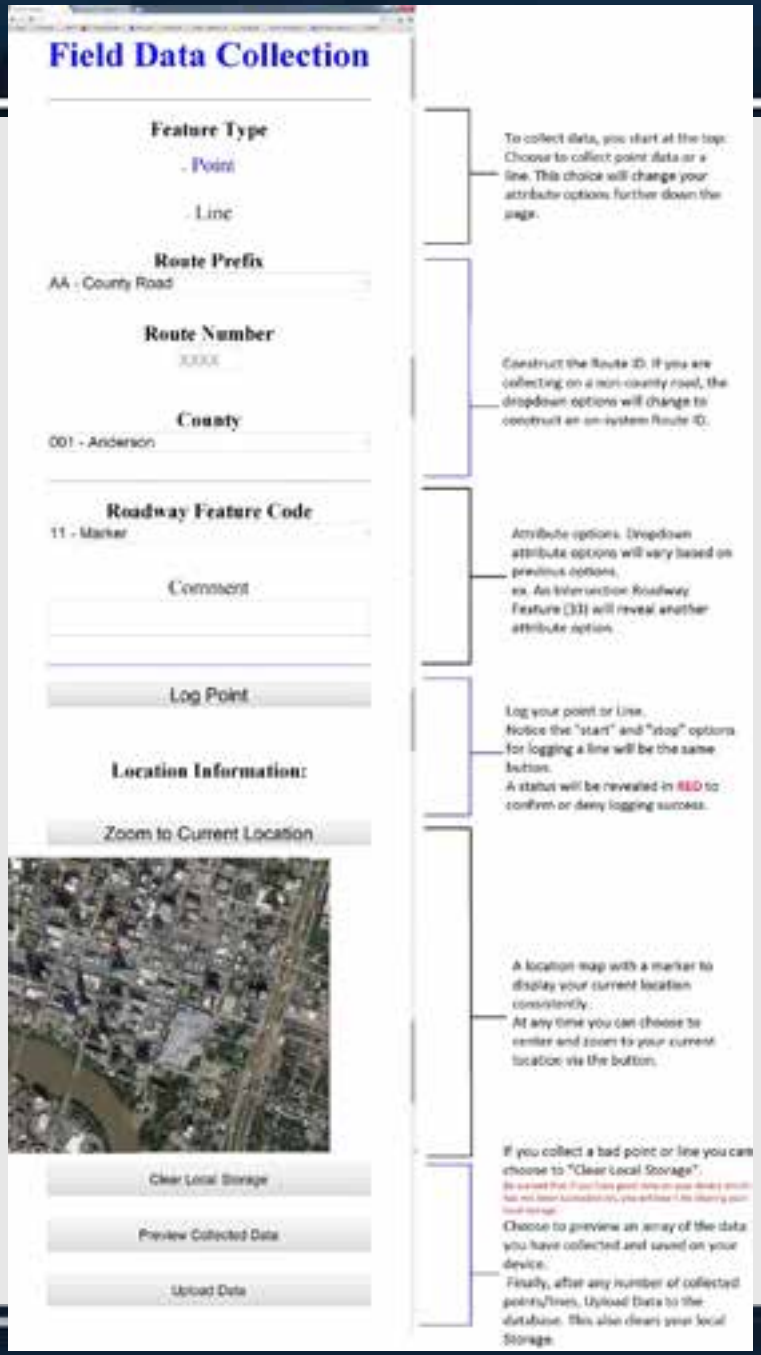
- Goal: Create an easily accessible application which can utilize readily available smart device hardware for mass, mapping grade, data collection efforts
  - Android vs iOS vs Windows
- The Idea: Simplicity is golden
  - HTML5
  - Geolocation API
  - Local Storage
  - GPS doesn't require cell service
  - Use 'Form' type options to create text based attributes
  - Upload collected data directly to a database for immediate use



Application and Technical Specs

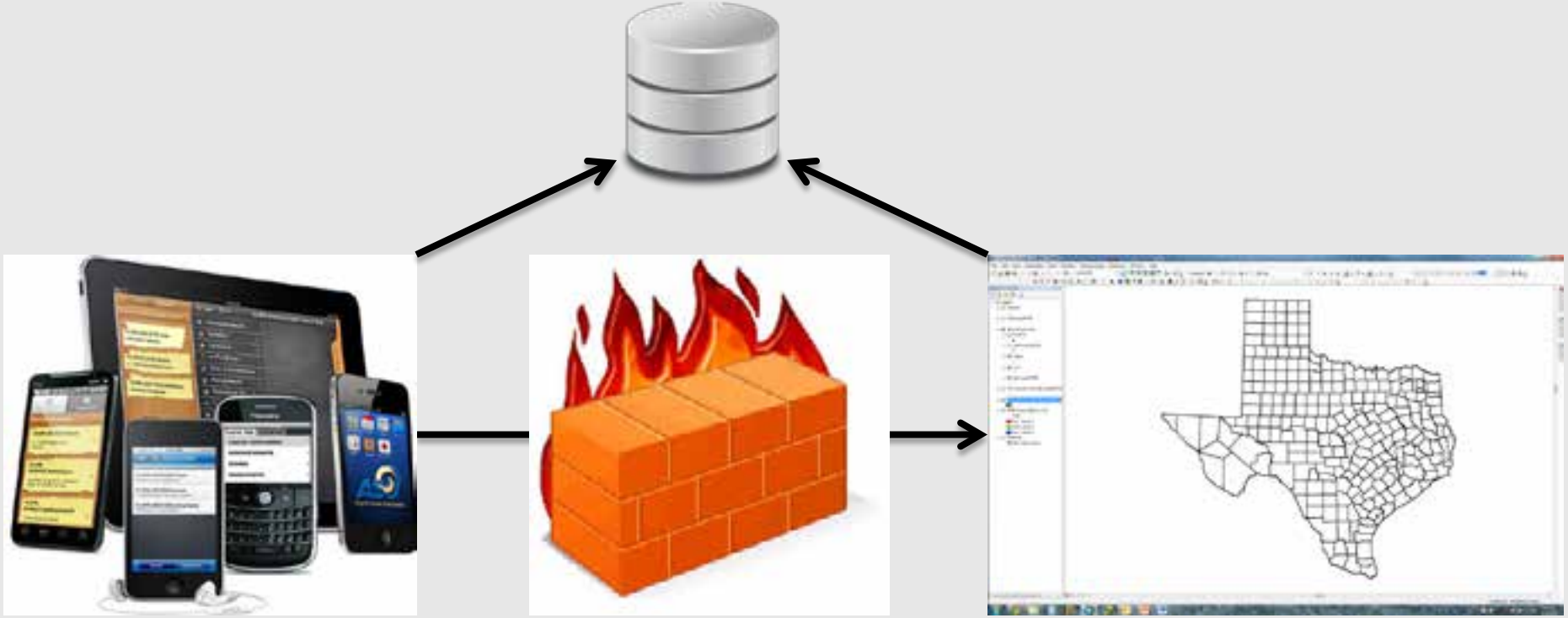
We did it!

- Primitive layout established for testing
- Design Customization (Project Specific)
- Points vs Lines
- Make attribute options dependent
- Geolocation Better-Than Accuracy Rating
- Associated Map
- How to get the data uploaded?



Application and Technical Specs

- Initial Firewall Issues
- Post to non-network server to format and retrieve later
- PostgreSQL database with PostGIS



Initial Testing Results

- Tested application on multiple iPhones, iPads, and several Android devices
- Collected data simultaneously on the Trimble Pathfinder and Trimble SB units
- Results compared in ArcMap at the roadway digitization standard scale 1:3000
- Factors tested:
  - Linework at various speeds
  - Points at various speeds
  - Signal Reliability
  - Storage Capacity
  - Device specific issues

Initial Testing Results

§ Linework

Initial Testing Results

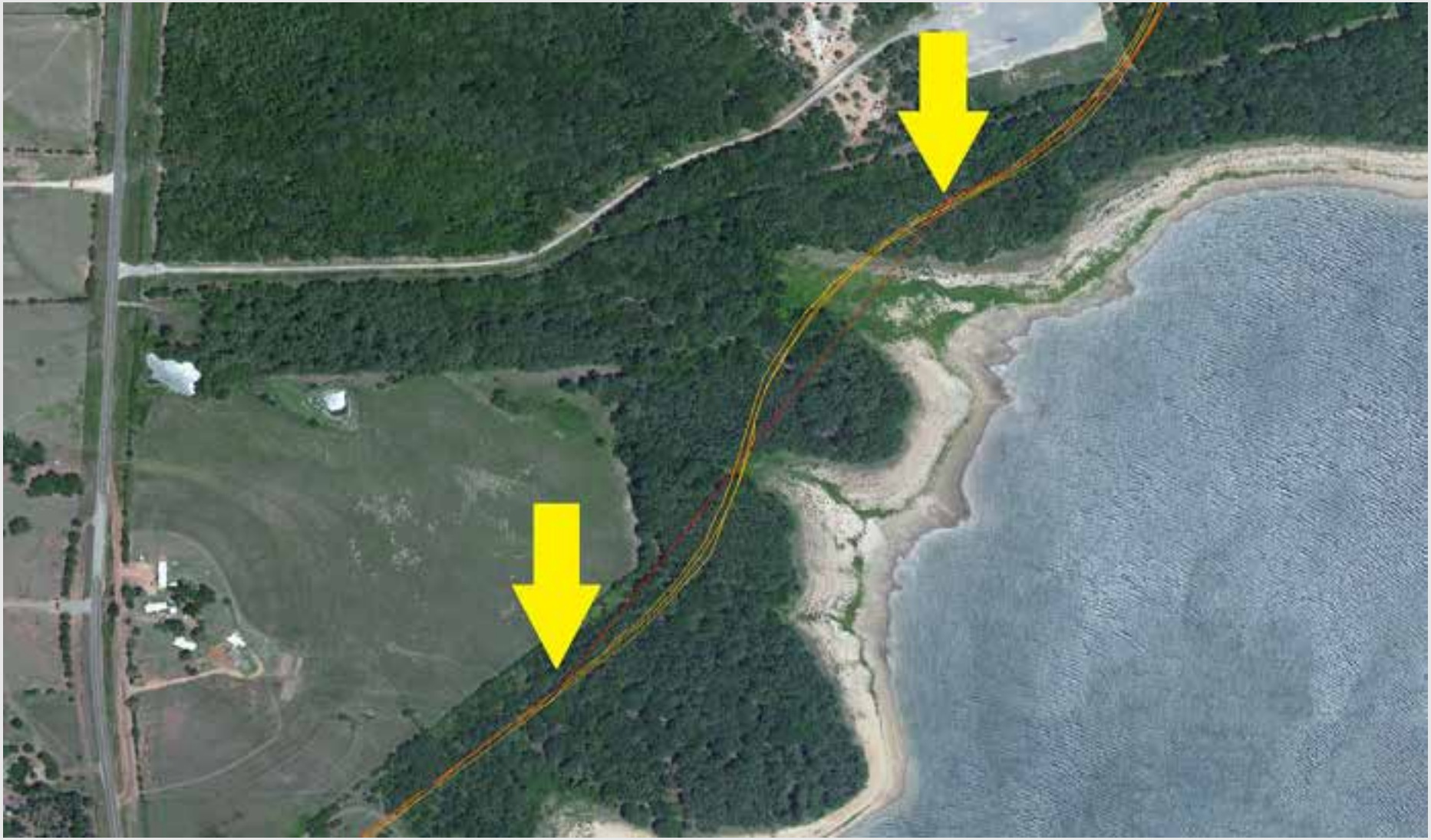
§ More Linework

Initial Testing Results

§ Points

Initial Testing Results

§ Signal Loss Issues



Best Practices

- Default browser most efficient
- “Private Browsing” causes issues
- Consistent speed while collecting data
- Stay awake

Benefits

- Cost
- Hardware Reduction
- Less Training and Less Error
- Battery Requirements
- Utilized by more people simultaneously
- Instant upload and office use
- Points collection simultaneous to lines

Future Improvements

- Security (login and password)
- General layout positioning
- Hide/Show Tracking Map with alternative basemaps
- Smart Device and User Metadata
- ‘Idle’ device prevention
- Stand-still recognition for point collection
- RTK (Real Time Kinematic) Position Network connection
- Collected data review

Conclusion

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Transportation Planning & Programming (TPP) – Mapping Group

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