



Building a Web-Based GIS for Crash Mapping in Puerto Rico

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Introduction

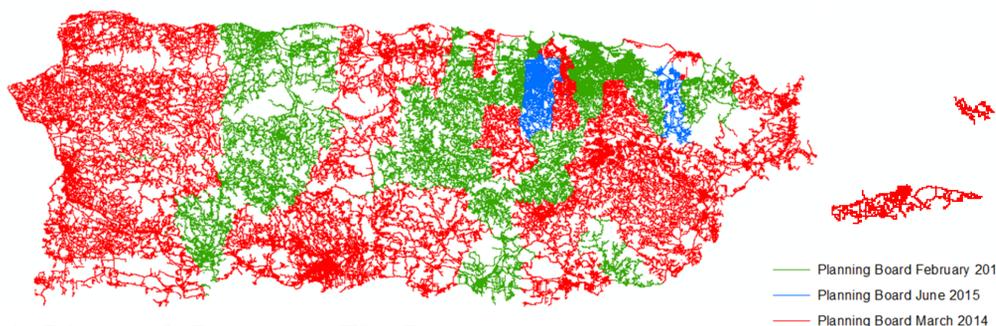
Transportation safety is a major concern for State Departments of Transportations (DOT). In order to make roadways safer, government officials must first identify vehicle crash hotspots and other areas that pose a threat to driver safety. Many DOTs use Geographic Information System (GIS) to map, manage, and analyze vehicle crashes. Puerto Rico Traffic Safety Commission is developing a tool for crash mapping analysis. A study was launched to create a GIS-based system that uses intersection and road segment geospatial attributes to identify the location of the crash within the Puerto Rico roadway network for crash mapping and analysis.

Objectives

Use GIS to:

- Merge existing linework with open data linework to create basemap
- Evaluate the effectiveness of using open data as a supplement to incomplete linear referenced road networks
- Integrate linear referencing methods (LRM)
- Improve basemap quality

Methodology



— Planning Board February 2015
— Planning Board June 2015
— Planning Board March 2014

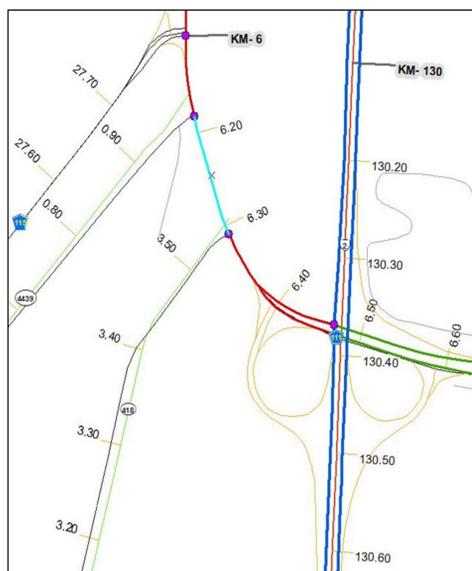
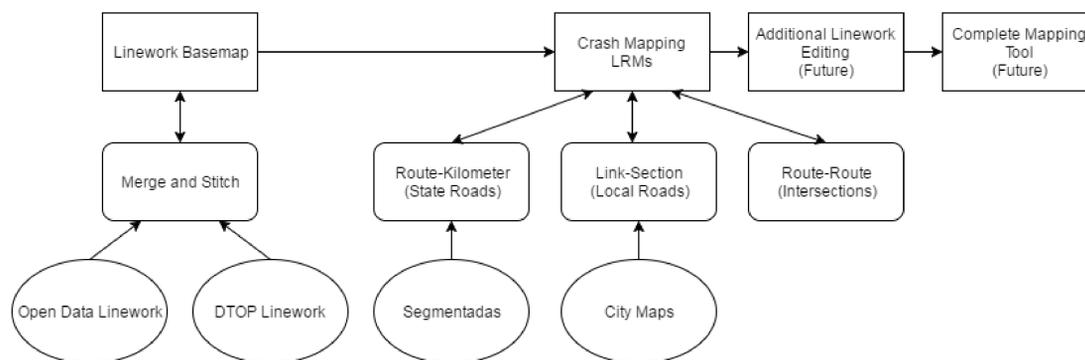


1) Linework Basemap: The Department of Transportation and Public Works (DTOP) in Puerto Rico provided files of GIS-based linework to represent the roadway network.

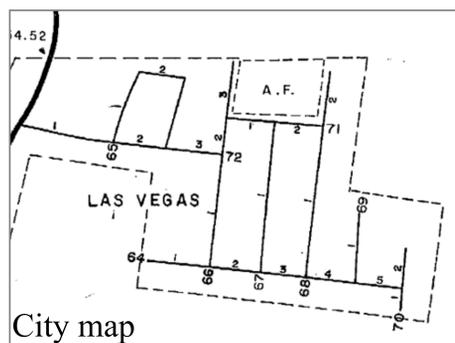
2) Merge and Stitch: The different files of DTOP linework were merged and stitched along with a minimal amount of Open Data linework to create an improved basemap of the roadway network.

3) Crash Mapping LRMs: Three linear referencing methods will be used to locate a crash site location: Route-Kilometer, Link-Section, and Route-Route.

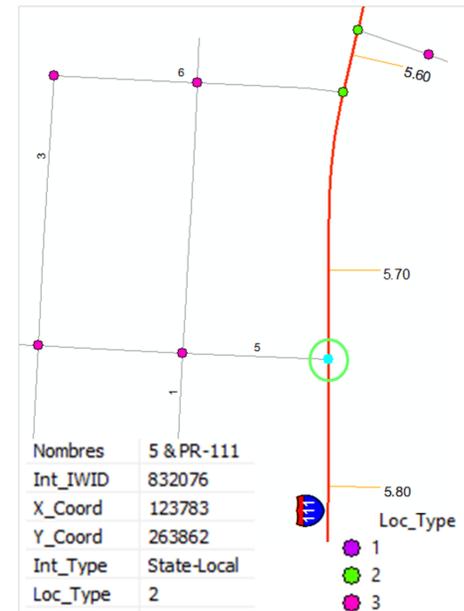
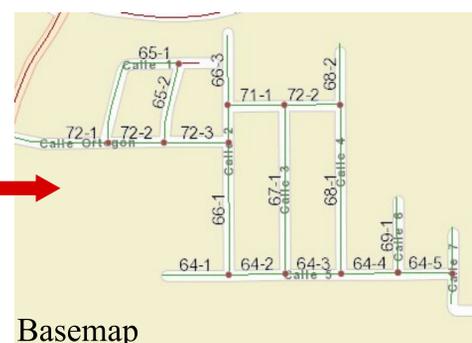
Project Flow Chart



Route-Kilometer: Kilometer post data was transferred from the present DTOP roadway system, Segmentadas, to the basemap. Crash locations on state routes are identified using this data.



Link-Section: Link and section data is being transferred from city maps to the basemap. Crash sites on local roads are identified with this data.



Route-Route: Intersections are identified with unique Island-Wide Identification Number (IWID). Three location types are established: (1) State-State, (2) State-Local, (3) Local-Local. Intersection crash sites are identified using the location type and IWID.

Results and Conclusion

OpenStreetMap was used to create a connected and improved roadway network. Both local and state routes are mapped on the same layer. Open data is a viable source of linework and data can be used to supplement existing DOT GIS roadway networks. Linear referencing methods were successfully integrated. There is a degree of linework and data inaccuracy due to collaborative mapping; therefore, the time and effort required to correct these errors should be weighed against the resources needed to draw linework and attribute data from scratch.

Future Work

- Additional editing on inaccurate segments
- Use GIS linework and data in web-based tool for crash mapping and analysis

Acknowledgements

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