Enhancing Architectural Survey
A Home Brew / Street View Mashup in Coastal Cumberland County

In the wake of Superstorm Sandy in 2012, the need for rapid architectural survey assessment and multi-agency coordination became vital to streamlining recovery efforts through the historic preservation review process. After a multi-year cooperative survey with FEMA, which was enhanced with GPS and geo-referenced digital photography, the NJ Historic Preservation Office (NJHPO) began looking for new survey techniques to build upon the FEMA experience. Having played with GoPro cameras for capturing architectural still images, staff wanted to evaluate how wide angle video could be leveraged for rapid architectural survey. Simultaneously, we determined that Cumberland County, among the most rural of New Jersey's 21 counties, was not well represented in the statewide architectural inventory. Due to the likely impacts of future sea level rise and storm events, HPO focused on the coastal region of the county along the Delaware Bay, which was targeted to an area within ½ mile of the Sandy storm surge, using a target property list based on statewide tax data.

Map Drawn By:
New Jersey Historic Preservation Office, April 2017
 Kinney Clark, Data collection, Cartography
 Anne Chidley, Justyna Csolak, Data Processing

Software Used in the Workflow:
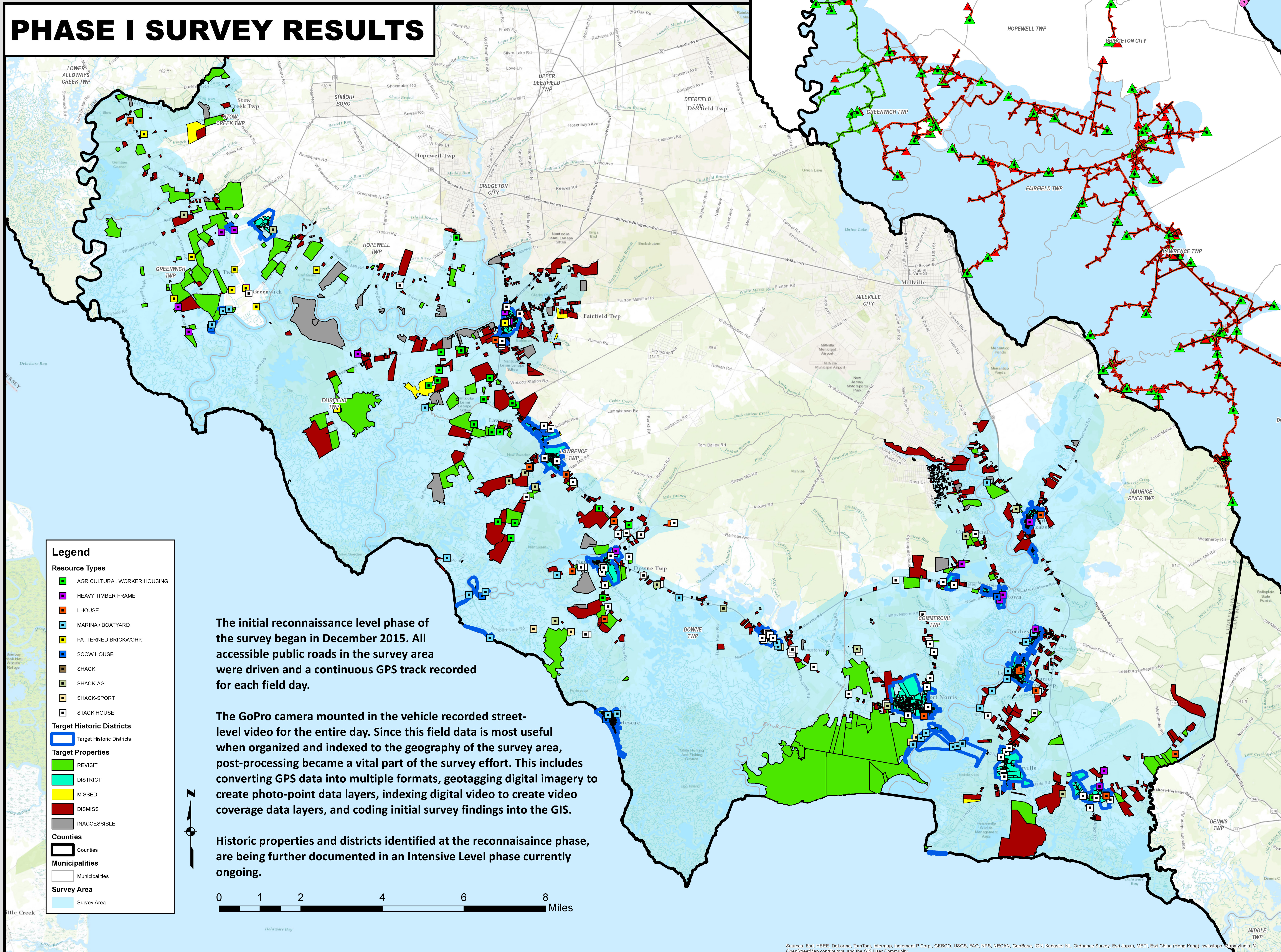
DNRGPS: GPS data conversion

MS PRO PHOTO TOOLS: Photo metadata editor to adjust timestamps

GPIC SYNC: Synchronize GPS data with images to geotag images

TIMECALCULATOR.NET: Online tool to calculate time offsets for video index

MPLAYER: Command line video player invoked from batch file

GPS DATA

PHOTO

VIDEO INDEX

1. Click index point with HYPERLINK tool...

2. Calls SCRIPT that passes video TIME and PATH attributes...

3. ...to a BATCH file that invokes MPLAYER command line video player...

4. ...which opens the video fullscreen paused at the index timestamp.

Video Indexing & Linking
The video coverage has particular value in reviewing field results. The initial thought was to augment traditional still photography with additional context, but the combination of GPS and video has proven to be a rich enhancement of the suite of survey products, particularly in rural Cumberland County where there is little Google Street-View coverage. Additionally, digital still photos can be extracted from the video when needed. HPO is also experimenting with overlaying animated maps into the video frame to further enhance the utility of the video data. This effort relied on a variety of software tools and techniques to achieve all of the post-processing steps. HPO will next look to automate some of these tasks to improve the GIS workflow for managing large datasets of field collected imagery.
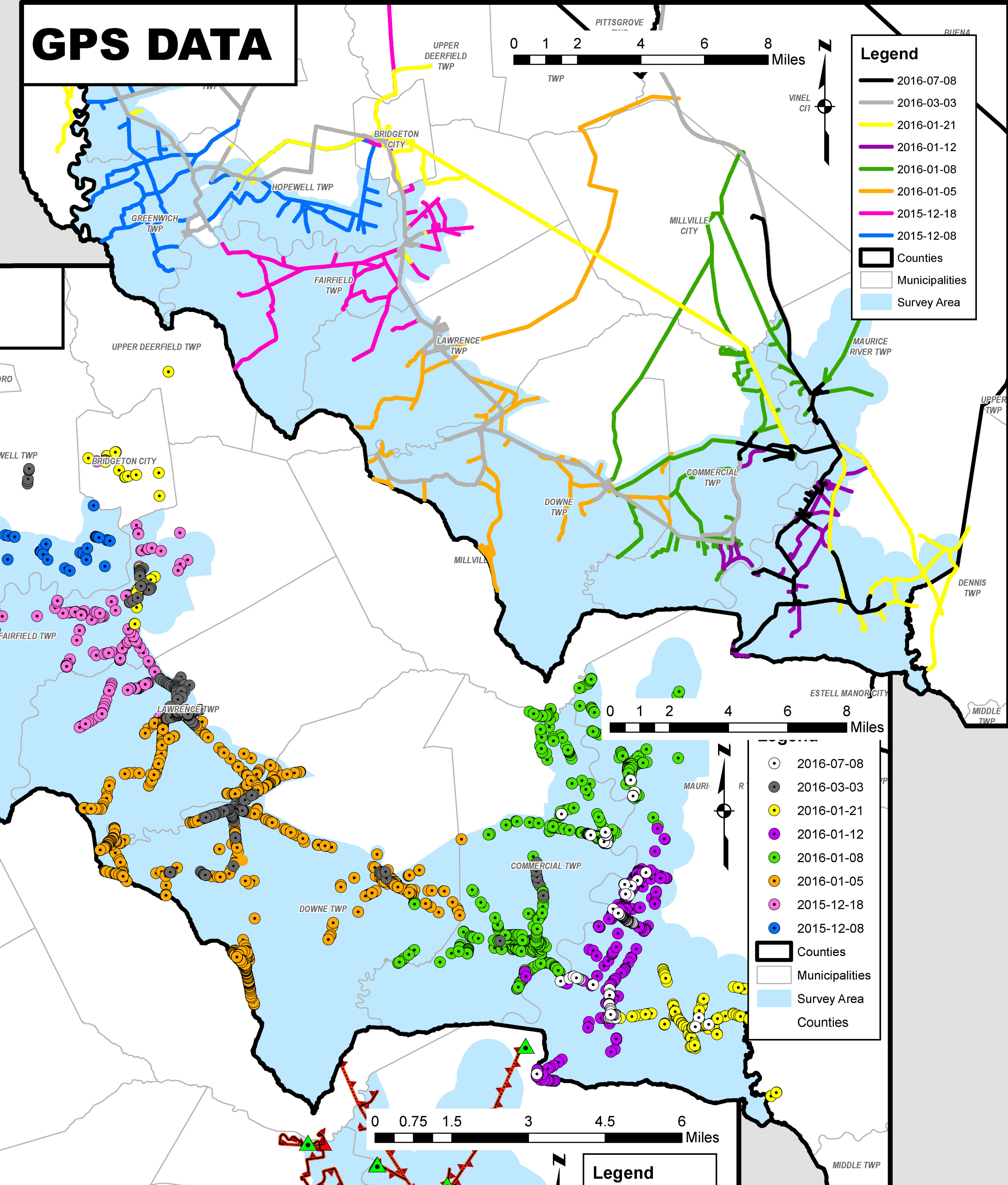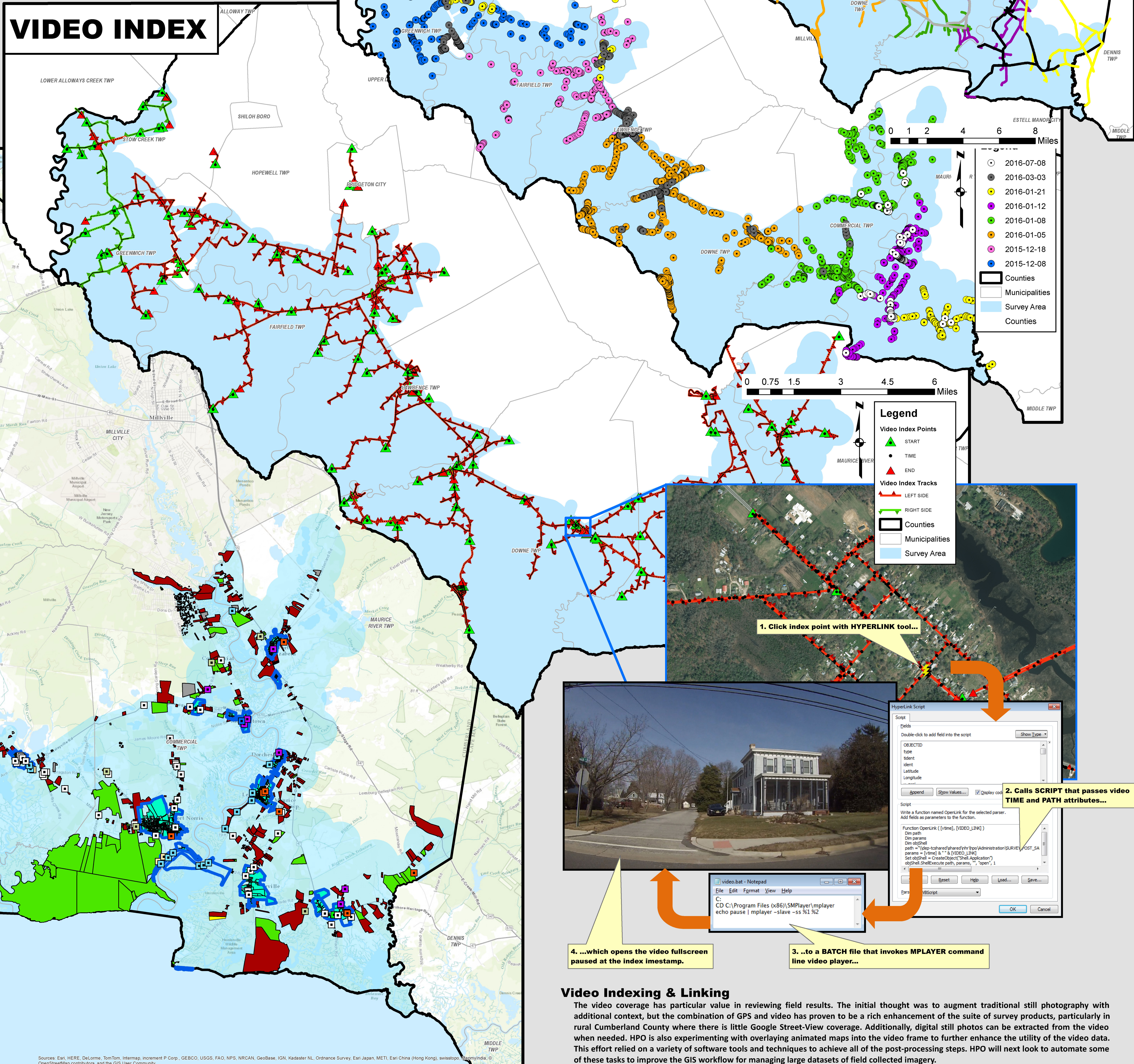
PHASE I SURVEY RESULTS

The initial reconnaissance level phase of the survey began in December 2015. All accessible public roads in the survey area were driven and a continuous GPS track recorded for each field day.
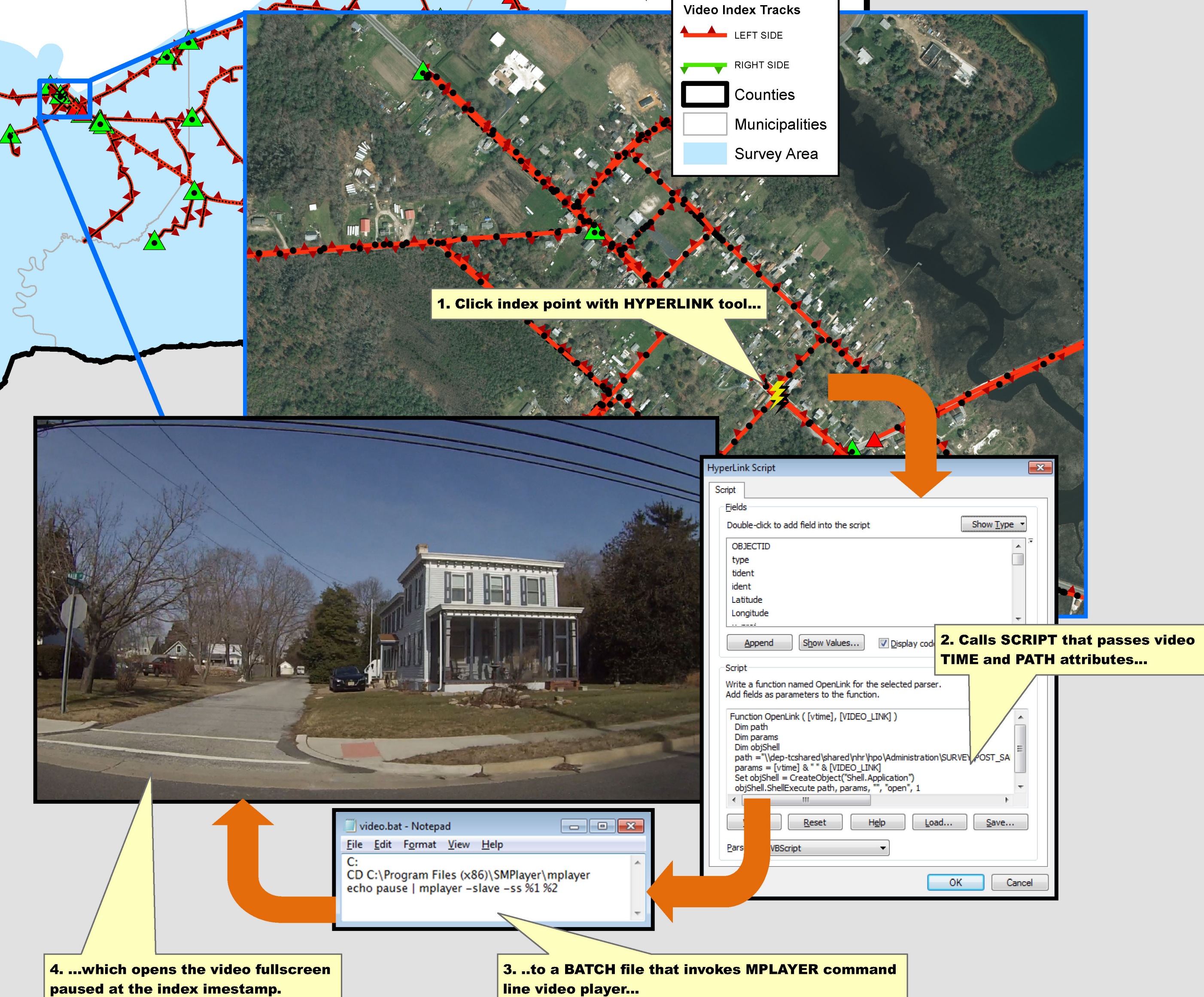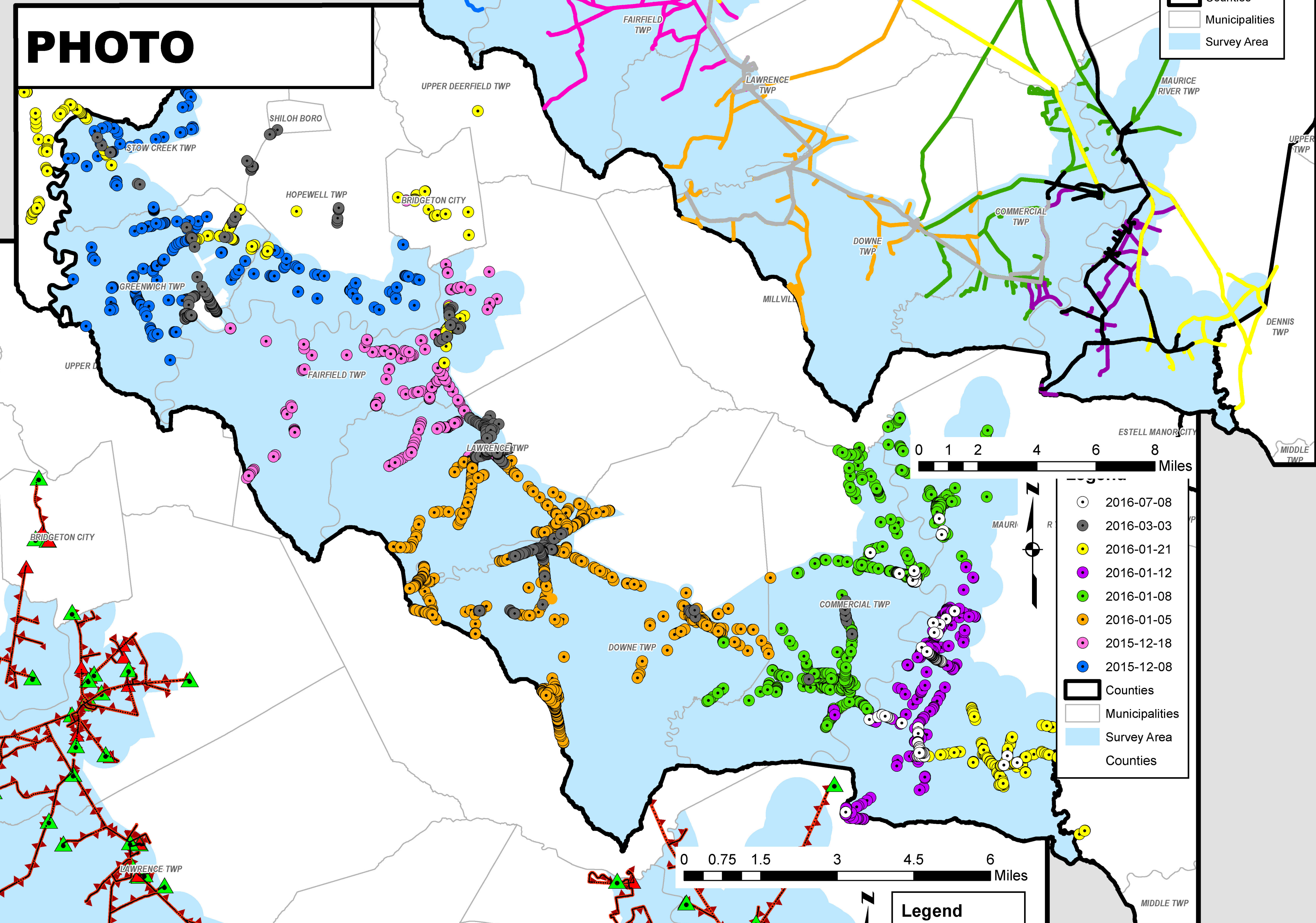
The GoPro camera mounted in the vehicle recorded street-level video for the entire day. Since this field data is most useful when organized and indexed to the geography of the survey area, post-processing became a vital part of the survey effort. This includes converting GPS data into multiple formats, geotagging digital imagery to create photo-point data layers, indexing digital video to create video coverage data layers, and coding initial survey findings into the GIS.

Historic properties and districts identified at the reconnaissance phase, are being further documented in an Intensive Level phase currently ongoing.