Collecting Statewide Rail Crossing Inventories with a Smartphone App
Michael Gilbrook, PhD, GISP, AICP, Senior Geospatial Professional, HDR, Orlando, FL

ABSTRACT TEXT: The effects of sea level rise on transportation infrastructure in Florida’s coastal areas have already become apparent. Fair-weather flooding of streets during “king tides” has become a common occurrence in the City of Miami Beach. According to current projections, similar overtopping of state roadways by coastal flooding on mainland Miami-Dade County is decades away. However, long before the roadway surface is inundated the roadway base may be compromised by elevated groundwater levels. In 2016, Florida DOT District Six sought to identify which state roads were at risk of violating the Roadway Base Clearance standards set out in the FDOT Flexible Pavement Design Manual based on a projected future Design High Water (DHW) elevation of 1.0 feet NAVD88.

A GIS-based screening analysis using recent 10-foot resolution LIDAR-derived Digital Elevation Model (DEM) data was conducted for all state roadways in the part of Miami-Dade County that fell within the zone of tidal influence east of the Salinity Control Line. A total of 41.1 miles (28.4%) of the 144.6 miles of state roads within this area were identified as being at-risk for not meeting the FDOT DHW base clearance criteria under the chosen future groundwater elevation scenario. In 2018, the same GIS screening technique was applied to US-1 through the Florida Keys, mainland Monroe County and southern Miami-Dade County using a 10-foot resolution LIDAR-derived DEM.

The analysis found that 57.2 miles (41%) of the total 138.3 miles of US-1 in that region was at-risk of DHW base clearance issues, assuming a future groundwater elevation of 1.6 feet NAVD88. ArcGIS Online web maps were developed to allow exploration of the two scenarios, in addition to the static map series provided in the final reports. These preliminary results provided the FDOT with specific sections of roadway to analyze in greater detail with the aim of guiding future roadway planning and design decisions.

High Density Aerial Lidar for Transportation and Hydraulics Engineering
Matt Vinopal, CP, CMS, GISP, Project Professional, Ayres Associates, Madison, WI

ABSTRACT TEXT: Lidar technology has evolved quickly since the late 1990s; therefore, acquisition and processing requirements have changed to keep pace with this remote sensing technology.

Ayres Associates has contracted with various Department of Transportations to acquire aerial lidar and imagery to derive a high accuracy terrain model and ortho imagery for the areas surrounding the United States.

The goal of this presentation is to 1) make lidar users aware of the advancements that have been developed within the lidar community; 2) describe typical products that can be created using lidar data; and 3) make recommendations for developing specifications for acquiring lidar for transportation and hydraulics engineering type of projects.