UTC Project Information	
Project Title	MPC-462 – Implementation of Aerial LiDAR Technology to Update Highway Feature Inventory
University	Utah State University
Principal Investigator	Ziqi Song
PI Contact Information	Research Assistant Professor Civil & Environmental Engineering Utah State University Phone: (435) 797-9083 Email: ziqi.song@usu.edu
Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08, Modification No. 1
Project Cost	$261,164
Start and End Dates	April 1, 2014 - July 31, 2017
Project Duration	3 Year
Brief Description of Research Project	UDOT's Maintenance Feature Inventory, housed inside the Operations Management System (OMS), was largely populated in 2012 as a result of a Mobile LiDAR (Light Detection and Ranging) data collection effort conducted by Mandli Communications. The Feature Inventory, however, is not static, so it is imperative to identify cost-effective means to keep the data current. Mandli will be conducting a new Mobile LiDAR data collection in 2014 in an effort to identify differences in the asset inventory from the 2012 data set. However, a more cost-effective means of identifying differences may be by employing Aerial LiDAR in areas where large-scale changes may have occurred, such as where new construction activities may have occurred subsequent to the original data collection. Aerial LiDAR technology offers the advantages of a) less time spent in data collection (days rather than months), and b) a view of the roadway from a different perspective, allowing features to be viewed and identified that may have been hidden from the Mobile platform. A possible disadvantage may be lower resolution of the point cloud (fewer data points per square meter). This project is to test whether Aerial LiDAR data can be a) obtained accurately and quickly enough to be cost-effective as compared to a second Mobile run, b) successfully merged with the Mobile LiDAR point cloud such that differences in the asset inventory can be easily identified, and c) used as a tool to identify features that were not visible from the Mobile platform.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	State DOTs and transportation agencies are always looking for better techniques to reduce costs. Airborne LiDAR is much faster in data collection than conventional surveying methods. This project further demonstrated that the point density of airborne LiDAR data is sufficient for most highway assets. Also, airborne LiDAR has the advantage over ground-based inventory technologies of providing a different perspective; as a result, it can detect objects like bridges and culverts that may be hidden from the mobile platform.
Impacts/Benefits of Implementation (actual, not anticipated)	The findings of this research can be used as a reference for state DOTs to choose proper methodologies to collect highway inventory data. Also, the LiDAR-data-based method may provide a stepping-stone for future researchers to develop more effective and efficient methods for highway assets detection.
Web Links • Reports • Project Website	https://www.ugpti.org/resources/reports/details.php?id=941