UTC Project Information	
Project Title	Stationary LiDAR for Traffic and Safety Applications – Vehicles Interpretation and Tracking
University	Purdue University
Principal Investigator	Dr. Andrew P. Tarko Professor of Civil Engineering, Director of Center for Road Safety, School of Civil Engineering Purdue University tarko@purdue.edu Dr. Mario A. Romero Research Scientist, Center for Road Safety School of Civil Engineering Purdue University maromero@purdue.edu
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Funding Source(s) and Amounts Provided (by each agency or organization)	$31,633: NEXTRANS Center/USDOT $31,633: Purdue School of Civil Engineering (discretionary fund of CRS Director – $11,949; 10% release time of Andrew Tarko – $19,686)
Total Project Cost	$63,268
Agency ID or Contract Number	DTRT12-G-UTC05
Start and End Dates	1/1/2013
Brief Description of Research Project	The project aims to develop a data processing module for a novel LiDAR-based traffic scanner - TScan. The TScan is being developed by the Center for Road Safety to collect microscopic highly accurate traffic data at road intersections. TScan uses Light Detection and Ranging (LiDAR) technology. This technology can detect various types of road users including buses, cars, pedestrians, and bicycles and, unlike video detection, it does not experience the well-known occlusion problem. The system consists of the LiDAR HDL-64E manufactured by the LiDAR Division of Velodyne Acoustics, Inc. installed on a pneumatic 42-

	foot telescoping mast elevated above the ground and positioned near a studied intersection. The sensor head rotates 900 times per minute, which results in 1.3 million data points per second. Data collected over a period of several hours to several days is stored in high-capacity devices. The system has been designed and all the components of the TScan system have been purchased or manufactured. The proposed effort covers the first phase of the overall effort. The second phase (not included in this proposal) will immediately follow the first one and it is meant to demonstrate the quality and usefulness of the obtained data for traffic conflict analysis. This phase will build an interface between the already developed data processing module and the existing Surrogate Safety Assessment Model (SSAM), which is freely available public domain software developed by Siemens ITS with FHWA funding. SSAM will convert the microscopic traffic information produced with TScan into meaningful safety-related information such as traffic conflicts and other risky interactions. The proposed research component focuses on developing a module capable of converting the source data into the microscopic measurements of the motion of identified objects across the field of view in a way to make it useful for more advanced analysis. Although the HDL64E unit in our possession was found useful for autonomous driving, it is still not clear if it can measure the dimensions and motion of objects at a sufficient level of quality for the envisioned applications. This is our primary research objective besides developing the data process to facilitate the required data conversion.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	

Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project website	