

UTC Project Information	
Project Title	MPC-465 – Development of Performance Matrices for Evaluating Innovative Intersections and Interchanges
University	University of Utah
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Funding Agencies	USDOT, Research and Innovative Technology Administration
Agency ID or Contract Number	DTRT12-G-UTC08, Modification No. 1
Project Cost	\$70,000
Start and End Dates	April 1, 2014- July 31, 2017
Project Duration	3 Year
Brief Description of Research Project	<p>Innovative (alternative, unconventional) intersections and interchanges are generally defined as design concepts that are able to reduce the number of signal phases and conflicts at the main intersection/interchange, thereby increasing the efficiency, capacity and safety of the signalized intersection. In most cases, this is accomplished by rerouting left turns at a point well ahead of the main intersection/interchange, or accomplishing left turns through a combination of through, right and U-turn movements. These designs are regarded to be “unconventional” because they incorporate geometric features or movement restrictions that would be permissible at standard intersections/interchanges. Such elements include the elimination and/or relocation of various through and turning maneuvers, the use of indirect turning movements, and the inclusion of roundabout designs.</p> <p>Innovative intersections and interchanges, primarily Continuous Flow Intersection (CFI) and Diverging Diamond Interchange (DDI), have seen an increase in numbers in the United States over the past several years, especially in Utah, making Utah a leader in the country in implementation of these designs. Although on the surface these designs seem to improve traffic performance, their complete impacts and benefits are hard to assess. There are still no clearly defined guidelines and methodologies for monitoring and measuring performance of these designs from state DOTs manuals, AASHTO, HCM, NEMA and HSM. Innovative designs have impacts on safety, accessibility, transit, pedestrian and non-motorized traffic, land use, economic development, and environment, making them an excellent candidate for an in-depth analysis of different benefit-impact combinations. There is not a defined straightforward way for this analysis. Researchers and practitioners have recognized that there are gaps when it comes to</p>

	<p>innovative solutions, so it can be expected that research in this area will increase in the next several years.</p> <p>Research Objectives: The primary objective of this research project is to develop a set of performance matrices for evaluation of innovative intersection designs, from operational, safety, accessibility, transit, pedestrian, non-motorized traffic, land use, economic development, and environmental standpoints. The methodology will be based on a set of algorithms implemented in an underlying computational engine (i.e. Excel-based program), which will generate performance matrices based on the given geometric, traffic, transit and land use data.</p> <p>Secondary objectives of this research project are to provide in-depth insights into the innovative designs, guidelines and methodologies for their evaluation. In addition to the visual representation in the performance matrices, the algorithms will provide quantitative values for each performance measure. These indicators can be used for engineering evaluations, and for communicating the results to the public.</p> <p>The anticipated results of this study would help DOTs make better and more informed decisions about the implementation, and performance and safety evaluations of innovative solutions. Each implementation is unique, and there are a lot of parameters that have to be considered before, during and after the implementation. This research is expected to deliver a set of straightforward methodologies and performance matrices for these evaluations.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>Parts of the study were used by the Utah Department of Transportation to assess the safety of the innovative designs. There were also interests from other agencies, such as Virginia DOT, for both operational and safety assessment modules.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>The developed modules can significantly reduce time for the assessment of innovative designs, especially during the planning stages. It is estimated that the use of these modules would take about 5% of the time needed to develop microsimulation models (which are now mostly being used for this purpose) for each individual site.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<p>https://www.ugpti.org/resources/reports/details.php?id=951</p>