RESEARCH
PROJECT CAPSULE [23-1SS]
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TECHNOLOGY TRANSFER PROGRAM

# Safety and Traffic Operations at Cloverleaf Interchanges

## JUST THE FACTS:

*Start Date:*
*August 1, 2022*

*Duration:*
*24 months*

*End Date:*
*July 31, 2024*

*Funding:*
*TT-Fed/TT-Reg-5*

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## POINTS OF INTEREST:

*Problem Addressed / Objective of Research / Methodology Used / Implementation Potential*



## PROBLEM

The efficient operation of highway interchanges is critical for the creation of an effective highway system designed to transport large numbers of cars quickly and safely over long distances. In this regard, the diamond interchange is the most common type of roadway interchanges where a major highway intersects a minor facility. It is suited for both rural and urban regions. One advantage of the diamond interchange is that it doesn't take up much space, and therefore is relatively economical to construct. On the other hand, it increases the possibility of congestion. At the intersection of two fully controlled access facilities or when left turns at-grade are forbidden, a cloverleaf interchange is the simplest design that can be used. A cloverleaf interchange is suitable in a rural setting where right-of-way is not an issue and weaving is minor. However, cloverleaf interchanges can be also suitable in urban regions based on site conditions.


***Figure 1. An example of one of the interchanges under investigation in Louisiana (Google map)***

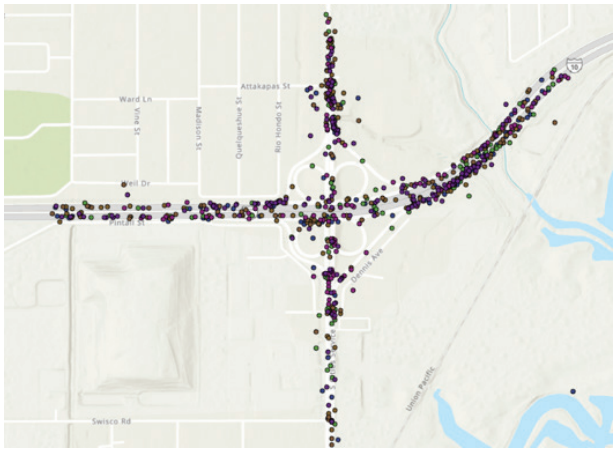

***Figure 2. Distribution of crashes on a full cloverleaf interchange (I 10/ LA 108) during the last 5 years***

## OBJECTIVE

The primary objectives of this research are to:

1. Assess the safety and operational performances of cloverleaf interchanges in Louisiana as compared to the traditional diamond interchanges.
2. Use safety and traffic analysis to predict future performance of cloverleaf and diamond interchanges in Louisiana.
3. Suggest countermeasures/ alternative interchange solutions that should be implemented if a cloverleaf/diamond interchange is not an appropriate alternative based on their predicted future performance.

## METHODOLOGY

To achieve the objectives of this study, the following methods will be used.

1. An in-depth literature review will be conducted.
2. The team will collect data related to traffic, roadways, geometric, and crash data.
3. A microsimulation model will be developed and analyzed.
4. The crash database for Louisiana will be analyzed.
5. The team will present a summary of their findings and make recommendations based off of this.
6. A final report will be prepared and submitted.

## IMPLEMENTATION POTENTIAL

The study findings will enable transportation authorities to predict future performance of cloverleaf and diamond interchanges in Louisiana. Also, actionable countermeasures will be suggested if a cloverleaf/diamond interchange isn't an appropriate alternative based on their predicted future performance. Accordingly, it is expected that implementing the findings of this research can assist transportation authorities in Louisiana in improving traffic safety and traffic operation performances of diamond and cloverleaf interchanges.