

HIGHWAY CAPACITY MANUAL (HCM) METHODOLOGY FOR ALTERNATIVE INTERSECTIONS / INTERCHANGES

Project Objectives

Over the past decade, the Federal Highway Administration (FHWA) has conducted and developed extensive research, workshops, technical briefs, and other outreach materials about alternative intersections/interchanges. These research efforts and publications have increased interest and rapid adoption of alternative geometric designs across the United States. Of the many alternative intersection/interchange designs, stakeholders showed significant interest in these four:

- Double Crossover Diamond (DCD) interchange (or Diverging Diamond Interchange (DDI)).
- Displaced Left Turn (DLT) intersection.
- Median U-Turn (MUT) intersection.
- Restricted Crossing U-Turn (RCUT) intersection.

Most existing analysis tools supporting the adoption of alternative intersections/interchanges involve the use of complex microscopic simulations that are expensive and time consuming. The Highway Capacity Manual (HCM) and the Highway Capacity Software (HCS) are widely used analytical tools that assess the quality of service for conventional intersections and interchanges. However, they do not assess any of the alternative designs considered in this project.

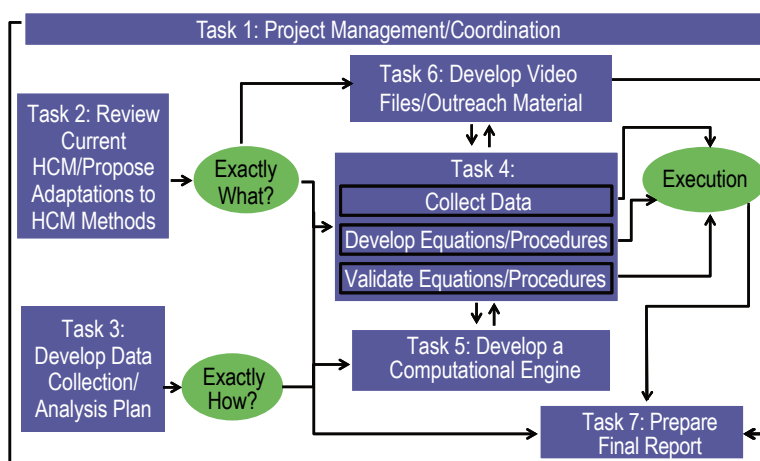
To support the increased exposure and interest in these designs, FHWA is conducting activities to integrate alternative intersection/interchange guidance into the HCM and HCS. This will help expand the portfolio of design alternatives contained in the HCM and enable a side-by-side assessment of their operations in contrast to traditional designs.



The new HCM guidance and procedures resulting from this project will assist agencies in evaluating capacity and quality of service for the design and operation of alternative intersections/interchanges.

Project Tasks

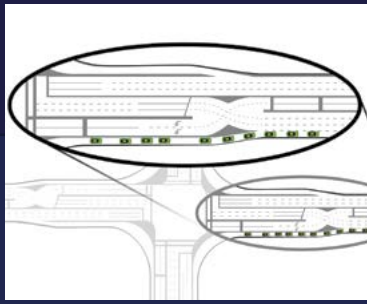
The project consists of seven tasks. Task 1 includes administrative activities throughout the duration of the project. Task 2 involves identifying knowledge and methodology gaps in the current 2010 HCM, formulating an analysis framework, and identifying field data collection necessary to address knowledge and methodology gaps. Task 3 will determine the applicability of existing HCM models to the new designs, and will decide whether data is on hand, or if field data collection and simulation are needed. In Task 4, the project team will reduce and analyze field data collected for development of HCM procedures during Task 3 and prepare a report consisting of new or modified HCM procedures for each intersection/interchange type. Task 5 will involve updating existing HCS modules to incorporate the newly developed methods for alternative intersections/interchanges. Tasks 6 and 7 will produce outreach videos from simulation and the final project report in the form of draft HCM chapters for alternative intersections/interchanges.



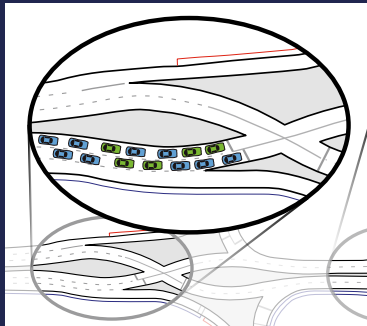
Pooled Fund Study Partner States

Alabama, California, Colorado, Florida, Missouri, North Carolina, Nevada, Ohio, Washington, Wisconsin

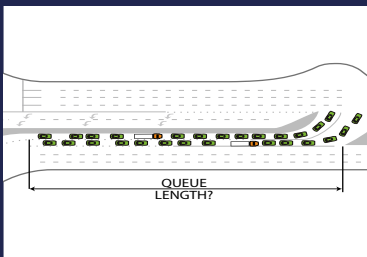




Right-turning vehicles and right-lane merging with through traffic at a DLT intersection



Lane utilization at DCD interchange (also known as DDI) crossovers



U-turn queue length at U-turn crossover for a Restricted Crossing U-Turn (RCUT) intersection

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Alternative Intersection/Interchange Designs Studied



DCD interchange (also known as DDI)



MUT Intersection



DLT Intersection



RCUT Intersection

To Contribute to the Research Team's Discussion

Inform – Provide effective marketing and outreach material that outlines progress on HCM guidance for alternative designs.

Educate – Provide working tools to State and local agencies and roadway practitioners for use on existing or new alternative design projects.

Interact – Generate effective outreach efforts to allow practitioners and researchers opportunities to interact and discuss issues and opportunities surrounding alternative designs.

Influence – Create opportunities for diverse groups to influence development of HCM guidance for and field deployments of alternative intersections/interchanges.

Collaborate – Provide a platform for collaboration among various groups with an interest in alternative designs.

Partner – Work with various agencies and individuals to enhance the value of HCM tools available to support the operations of and analysis needs for alternative designs.

The project team is maintaining an online collaboration tool to facilitate announcements, forums, and file sharing with project stakeholders, including the advisory and review groups. The research team intends to provide project updates and facilitate feedback in a variety of relevant forums.