Intersections are an important part of an urban roadway. The efficiency, safety, speed, cost of operation, and capacity of the facility is a function of its design and how it operates. The main objective of intersection design is to facilitate the convenience, comfort, and safety of people traversing the intersection while enhancing the efficient movement of motor vehicles, buses, trucks, bicycles, and pedestrians. In order to design urban intersections that are both functional and effective, designers need current information regarding intersection design that is easily accessible and in a user-friendly format.

What We Did...

The goal of the Texas Department of Transportation (TxDOT) Project 0-4365 was to produce a reference document, the *Urban Intersection Design Guide*, to provide information about intersection design. The project’s objective was to provide TxDOT and other interested parties with useful and practical information regarding operations and design for urban intersections.

Objectives for the document included:
- relate geometric and operational issues,
- provide guidance versus policy,
- draw on strengths of other manuals, and
- produce an online document with links to other TxDOT manuals.

The project was a three-year effort and was structured in two phases. Phase I took place during the initial 12 months of the project and focused on gaining an understanding of the myriad of transportation-related issues associated with intersections through one-on-one interviews, focus groups, and a review of current references regarding intersections. These efforts were used to generate a draft of the *Guide* and to set direction for Phase II.

A key direction for Phase II was to develop guidance material appropriate for new engineers and designers. The research team developed “applications” of intersection design principles that covered the following areas:
- innovative treatments,
- checklists,
- discussions of tradeoffs using real-world design scenarios, and

The applications were assembled into a second volume of the *Guide*. Therefore, the
Urban Intersection Design Guide document was developed as a two-volume report:

• Volume 1 – Guidelines and
• Volume 2 – Applications.

When assembled onto the TxDOT website, the two volumes will interlink so that the reader can quickly move from the guidelines to an application. The Guide will also be linked to other online documents.

What We Found...

The material for the Urban Intersection Design Guide is divided into 11 chapters. Table 1 lists the sections included in the Guidelines volume and the applications included in the Applications volume.

The Guidelines volume provides readers with information on intersection design elements together with related figures or tables needed for a design. In some cases, rather than repeating information, the link to the relevant TxDOT manual or reference to the Green Book chapter will be provided so that information is not duplicated between the documents.

As an example, when considering intersection sight distance (ISD), the reader can review a summary of intersection sight distance cases together with the potential adjustments that could figure in an intersection sight distance calculation. If information is desired on Case F (Left Turn from the Major Road), for example, the reader will find discussion along with a figure illustrating the situation (see Figure 1). If the reader wants step-by-step guidance for ISD Case B2, Application 3-3 can be reviewed. Other examples of material in the Guide are shown in Figures 2 and 3.

The Researchers Recommend...

The Urban Intersection Design Guide serves as the implementation product from this project. It contains guidance, discussions, procedures, checklists, and recommendations addressing many different aspects of intersection design. Publication of the document in TxDOT’s online manual system will ensure widespread availability of the materials produced in this project.
<table>
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<tr>
<th>Chapter</th>
<th>Guidelines Sections</th>
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</thead>
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• Utility Accommodation  
| 2       | Design Control and Criteria | • Subdivision Entrance  
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| 11      | Influences from Other Intersections | • Signs Checklist  
• Traffic Control Devices for Dual Left-Turn Lanes  
• Realignment of Intersection  
• Control of Access to Driveways  
• Turning Restrictions  

Table 1. Sections and Applications within the *Urban Intersection Design Guide*. 
For More Details...

The Guide is contained within the following two volumes:
- Product 0-4365-P2, Urban Intersection Design Guide: Volume 1 – Guidelines
- Product 0-4365-P2, Urban Intersection Design Guide: Volume 2 – Applications

The research procedure and findings are documented in:
- Report 0-4365-1, Issues to Consider in Developing an Intersection Design Guide
- Report 0-4365-2, Summary of Issues in Intersection Design
- Report 0-4365-4, Turn Speeds and Crashes within Right-Turn Lanes

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