



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

BDE PROCEDURE MEMORANDUM

NUMBER: 19-03

SUBJECT: BDE Manual Revision – Chapter 37

DATE: April 12, 2019

Chapter 37 of the BDE Manual has been updated regarding ramp terminal intersection design and to add design guidance for Diverging Diamond Interchanges (DDIs) and for the evaluation of alternative interchange design types. Please see the BDE Manual on-line to view the revisions.

Background

In 2018, the Department issued updated intersection design policy. It modified design practice for right-turn approaches to improve the line of sight of right-turning drivers by reducing the skew of the approach angle while allowing semi-tractor trailer trucks to make right-turns without encroachment. Those updates were based on an Illinois-led driver behavior assessment and traffic crash-based safety analyses which indicated that the right-turn angle of intersection, typically determined by corner island design, plays a vital role in intersection safety. The 2018 policy changes to corner island design therefore represented an effort to improve intersection safety, and this update extends the changes specifically to the design of interchange ramp terminal intersections by providing guidance on several typical situations that can be encountered at such locations.

Additionally, guidance on the design of Diverging Diamond Interchanges (DDIs), based on national and recent Illinois experiences, has been added. A more comprehensive discussion of DDIs is included in Section 37-3.10.

Finally, a brief explanation of possible methods for selecting a preferred interchange type from multiple alternatives is added to Section 37-3.11.

Specific changes include the following:

- Updated references in both the Introduction and Reference sections specifically, and throughout the chapter generally.

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- Added language within Section 37-2.14, "Geometric Design Criteria," regarding pedestrians and bicyclists as design users at ramp/crossroad intersections.
- Revised the calculations for the Location of Initial Curve for an Exit Ramp in Figure 37-3.D.
- Expanded Section 37-3.10(a) to include the following information for the consideration and design of DDIs:
 - + Operational and safety advantages
 - + Alignment flexibility that can reduce costs especially related to the retention of existing bridges
 - + Methods for incorporating pedestrian and bicycle accommodations
 - + Signing and pavement marking guidance unique to DDIs
- Added Section 37-3.10(b) on design considerations unique to DDIs that have the potential to optimize both operations and safety performance, including:
 - + Design speed
 - + Alignment flexibility, radii, and superelevation
 - + Crossing angle
 - + Intersection sight distance
 - + Pedestrian and bicycle accommodation
 - + Lane and median widths
 - + Striping and signing
 - + Traffic control devices
 - + Operational analysis
- Added Figures 37-3.Y and 37-3.Z to illustrate the features of DDIs that are especially important to consider during layout and detailed design of these interchanges.
- Provided introductory information in Section 37-3.11 on the Intersection Control Evaluation (ICE) tools available from the FHWA for use on projects.
- Updated Section 37-5.01, "Ramp/Crossroad Intersections," by adding three brief points, as follows:
 - + Stated that pedestrians and bicyclists, where present, should be treated as design users of the intersection and given consideration in the design process along with the design vehicle.

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- + Explained the role of approach angle in corner island design in order to minimize driver head-turn and reduce adverse operating characteristics.
- + Emphasized the key role of stop bar placement in optimizing intersection sight lines and that stop bar locations adhere to requirements of the Illinois Supplement to the Manual on Uniform Traffic Control Devices (ILMUTCD).
- Incorporated right-turn approach angle of intersection standard corner island and radius return designs in accordance with the recent Illinois-led research. The revised corner island designs are depicted in Figures 37-5.D, 37-5.E, 37-5.F, 37-5.G, 37-5.I, 37-5.K, and 37-5.L. They provide various interchange type ramp/crossroad designs to incorporate the new recommended design practices to improve intersection angles.



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