Engineering Policy Ballot

Effective: April 1, 2025

Level 2

Level three revisions require the approval of the **Assistant Chief Engineer** and the **Federal Highway Administration** only. The Senior Management Team is encouraged to review the content and provide comment to the appropriate director. For all other parties, these revisions are posted for information only.

ENGINEERING POLICY BALLOT

Effective: April 1, 2025

Issue 1: At-Grade Intersection Type Options

Approval: Level 2 – Assistant Chief Engineer

Sponsor: Katy Harlan – TS

Summary: Additional guidance for selecting intersection control types. Providing additional guidance about intersection types implemented throughout the state with more context for consideration and comparisons.

Fiscal Impact: N/A

Publication: Engineering Policy Guide: 233.5(new)

Issue 2: Guidance for Roundabout Aesthetic Structures

Approval: Level 2 – Assistant Chief Engineer

Sponsor: Kataryna Garlock – TR

Summary: Addition of an EPG 241 section regarding "Roundabout Aesthetic Structures" regarding new policy for determining what is allowed and the submittal/approval processes for roundabout structures on MoDOT right of way.

Fiscal Impact: N/A

Publication: Engineering Policy Guide: 241.7(new), 941.5

Category: 233.5 Intersection Alternatives

Alternative intersection configurations may provide advantages over traditional at-grade intersections, or in some cases, even grade-separated interchanges. A given alternative intersection may provide safety, operational, or cost benefits at a specific project location. This article provides policy guidance and planning-level information on three types of potential alternative intersections, as well as traditional at-grade intersections and roundabouts.

This article does not attempt to provide geometric or traffic control guidance for any given intersection type. Appropriate articles within EPG 200 and EPG 900, respectively, shall be used for design guidance on geometric or traffic control elements for specific projects or proposed improvements.

Further analysis of an alternative intersection type at a given location may be required as part of a project scope (EPG 104), guidelines for which are described in EPG 905.

Glossary of Terms for Intersection Alternatives

AWSC: All-Way Stop Control
TWSC: Two-Way Stop Control
MUT: Median U-Turn
RCI: Reduced Conflict Intersection
RCUT: Restricted Crossing U-Turn
DLT: Displaced Left-Turn
CFI: Continuous Flow Intersection
PDLT: Partial Displaced Left-Turn
XDLT: Crossover Displaced Left-Turn

Articles in "233.5 Intersection Alternatives"

The following 6 pages are in this category, out of 6 total.

Alternative Intersection Additional Resources

FHWA Alternative Intersections/Interchanges: Informational Report (AIIR)

FHWA Intersection Safety

233.5.1 Alternative Intersection Comparisons

Contents

233.5.1.1 Alternative Intersection Summary

This article provides guidance, typically in the form of tables, figures, or nomographs, for further evaluation of given alternative intersection types. A range of criteria may be utilized for alternative intersection selection, such as intersection vehicular volumes (on an hourly or daily basis) or vulnerable road user safety considerations.

233.5.1.2 Intersection Selection by Traffic Volumes

The following figures provide potential guidance for alternative intersection selection either by the total entering daily volume for the intersection or by the peak two-way hourly volumes on the major and minor streets at the intersection.

Potential Intersection Control by Total Entering Daily Volume (ADT) provides guidance for generic ADT-based scenarios under which a specific intersection control type could be used. The term "-Nontraditional Intersection" refers to intersection types with unique geometrics or flow patterns. Non-traditional intersections considered by MoDOT include: Roundabouts, J-Turns (Restricted Crossing U-Turn Intersection (RCUT)/Reduced Conflict Intersection (RCI)), Median U-Turns (MUT), and Displaced Left Turns (DLT/Continuous Flow Intersection (CFI)).

Intersection Control Type by Peak Hour Volume Thresholds utilizes the peak hour directional distribution splits and two-way traffic volumes for both the major and minor roadways to determine the most appropriate intersection treatment, with a primary focus on traditional intersection control types. All lines shown are defined by the MUTCD 8-hour traffic signal warrant, MUTCD all-way stop warrant, and HCM methods for calculating roundabout capacity and stop-controlled intersection delay. Dashed lines represent an extrapolation of a capacity threshold for a given intersection type and geometric configuration, such as comparing a single-lane roundabout to a multi-lane roundabout.

233.5.1.3 Intersection Selection by Pedestrian and Bicyclist Safety Criteria

The following figures present the optimum feasible intersection configuration choice (per original source research study, not through MoDOT determination) for pedestrians and bicyclists given the number of through lanes and daily traffic volumes on the minor and major streets.

Pedestrian Optimum Feasible Intersection Design

Bicyclist Optimum Feasible Intersection Design

233.5.1.4 Intersection Selection by Vehicular Safety Criteria

The following figures show the intersection type that maximizes safety (per original source research study, not through MoDOT determination) based on various approach configurations and daily roadway volumes. Areas without a specific intersection type listed are either infeasible regions in which the minor street demand exceeds the major street demand, or where the alternative intersection types being considered are not feasible.

Intersection Type that Maximizes Safety Design for a Four-Lane Major Street Meeting a Two-Lane Minor Street

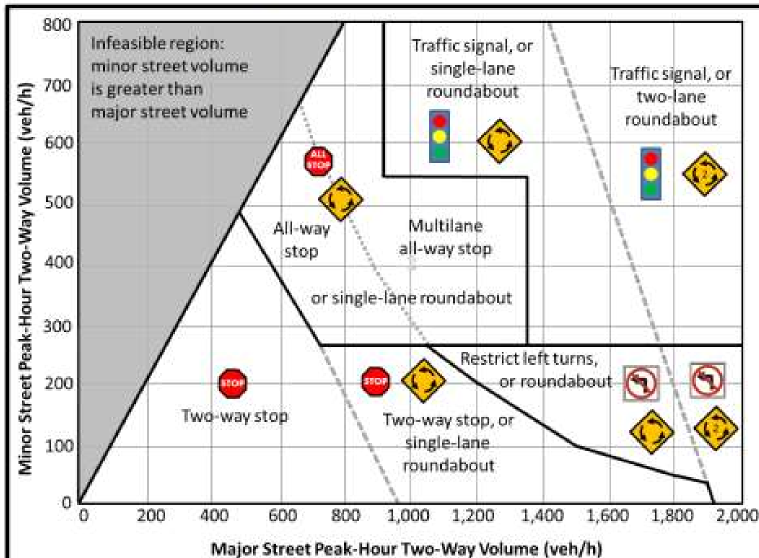
Intersection Type that Maximizes Safety Design for a Four-Lane Major Street Meeting a Four-Lane Minor Street

Intersection Type that Maximizes Safety Design for a Six-Lane Major Street Meeting a Two-Lane Minor Street

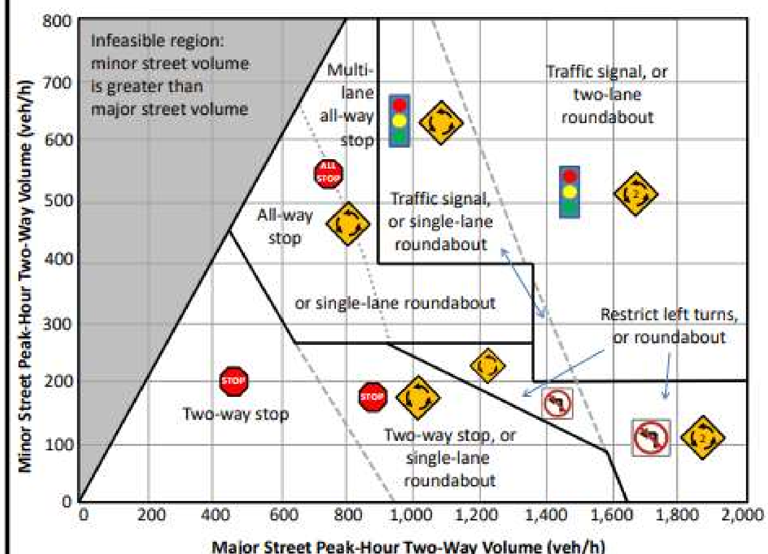
Approximate Combined ADT	**All Way Stop**	Signal	Roundabout	Non-Traditional Intersection
7,500-10,000	**X**		**X**	
10,000-50,000	**X**	**X**	**X**	**X**
50,000-80,000		**X**	**X**	**X**
>80,000				**X**

Potential Intersection Control by Total Entering Daily Volume (ADT)
(Altered from Minnesota Department of Transportation – Minnesota Intersection Control Evaluation Manual)

Use intersecting peak hour volumes to determine potential intersection control.



50/50 directional distribution on each street, 10 percent left turns and 10 % right turns, 1 lane per approach unless noted



67/33 directional distribution on each street, 10 percent left turns and 10 % right turns, 1 lane per approach unless noted

Intersection Control Type by Peak Hour Volume Thresholds

(NCHRP 825 – Planning and Preliminary Engineering Applications Guide to the Highway Capacity Manual)

Disclaimer: Information provided as part of this document is intended for policy guidance and initial planning evaluation. Information presented in this document does not supersede detailed requirements set by MoDOT for further analysis of specific projects or proposed improvements.

				Minor street						
			Number through lanes:	2				4		6 or 8
Major street			Low AADT:	0	5,000	7,500	10,000	10,000	25,000 and above	Any
Number through lanes	Low AADT	High AADT	High AADT:	5,000	7,500	10,000	15,000	25,000		
2	0	7,500		AWSC	AWSC	n/a	n/a	n/a	n/a	n/a
	7,500	15,000		Roundabout	Roundabout	Roundabout	Roundabout or Signal	n/a	n/a	n/a
4	10,000	15,000		TWSC	MUT	MUT	MUT	MUT	n/a	n/a
	15,000	20,000		TWSC	MUT	MUT	MUT	MUT	n/a	n/a
	20,000	25,000		TWSC	MUT	MUT	MUT	MUT	n/a	n/a
	25,000 and above			TWSC	MUT	MUT	MUT	MUT	MUT	n/a
6 or 8	Any			TWSC	MUT	MUT	MUT	MUT	MUT	MUT

Shaded cells represent cases when a particular design minimized the weighted total number of flags for both pedestrians and bicyclists.
Red lettering indicates a design that was also the safest feasible intersection design based on total crashes.

***Pedestrian** Optimum Feasible Intersection Design*

(Altered from NCDOT - Selecting Optimum Intersection or Interchange Alternatives)

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				Minor street						
			Number through lanes:	2				4		6 or 8
Major street			Low AADT:	0	5,000	7,500	10,000	10,000	25,000 and above	Any
Number through lanes	Low AADT	High AADT	High AADT:	5,000	7,500	10,000	15,000	25,000		
2	0	7,500		AWSC	AWSC	n/a	n/a	n/a	n/a	n/a
	7,500	15,000		Roundabout	Roundabout	Roundabout	Roundabout or signal	n/a	n/a	n/a
4	10,000	15,000		Unsignalized RCI or TWSC	MUT	MUT	MUT	Signalized RCI	n/a	n/a
	15,000	20,000		Unsignalized RCI or TWSC	MUT	MUT	MUT	Signalized RCI	n/a	n/a
	20,000	25,000		Unsignalized RCI or TWSC	MUT	MUT	MUT	Signalized RCI	n/a	n/a
	25,000 and above			Unsignalized RCI or TWSC	MUT	MUT	MUT	Signalized RCI	MUT	n/a
6 or 8	Any			Unsignalized RCI or TWSC	Signalized RCI	Signalized RCI	Signalized RCI	Signalized RCI	MUT	MUT

Shaded cells represent cases when a particular design minimized the weighted total number of flags for both pedestrians and bicyclists.
Red lettering indicates a design that was also the safest feasible intersection design based on total crashes.

***Bicyclist** Optimum Feasible Intersection Design*

(Altered from NCDOT - Selecting Optimum Intersection or Interchange Alternatives)

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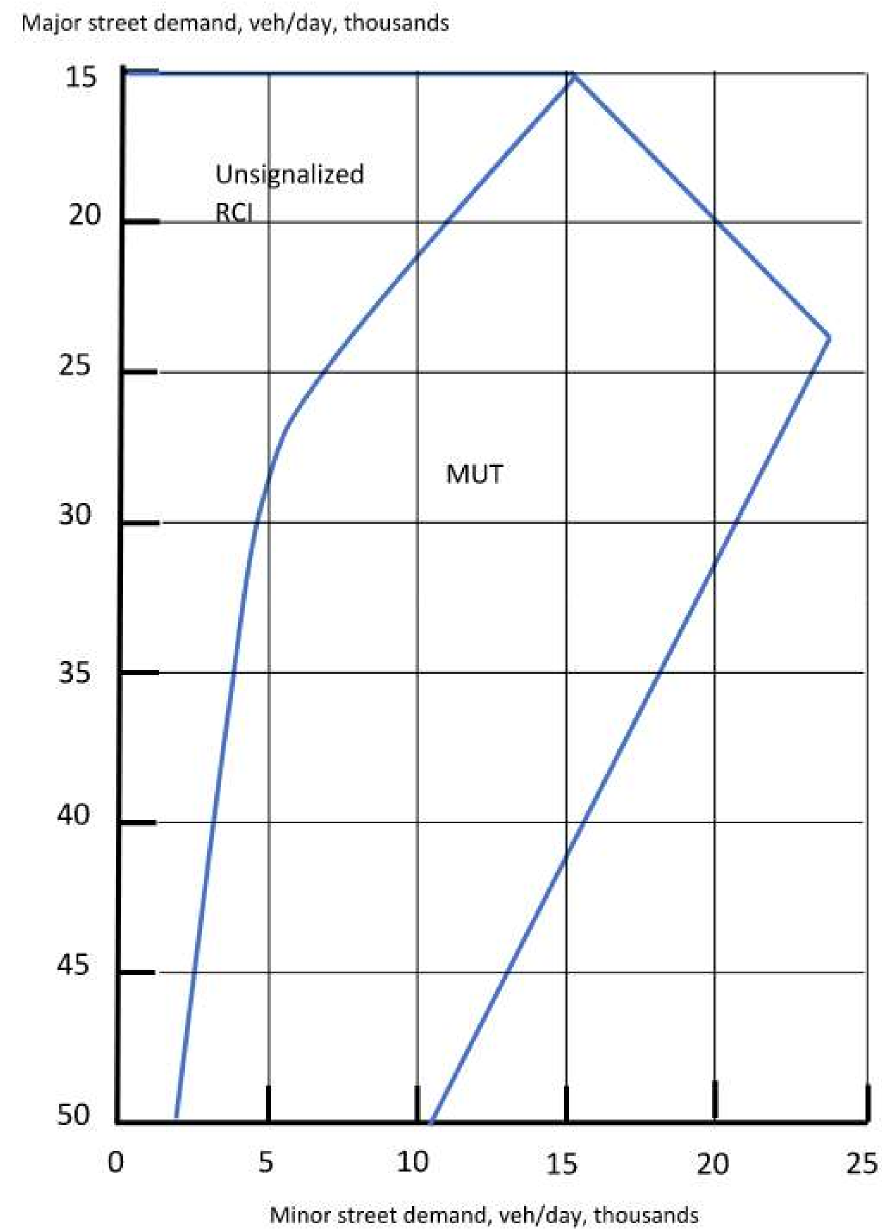

Intersection Type that Maximizes Safety Design for a Four-Lane Major Street Meeting a Two-Lane Minor Street

(NCDOT - Selecting Optimum Intersection or Interchange Alternatives)

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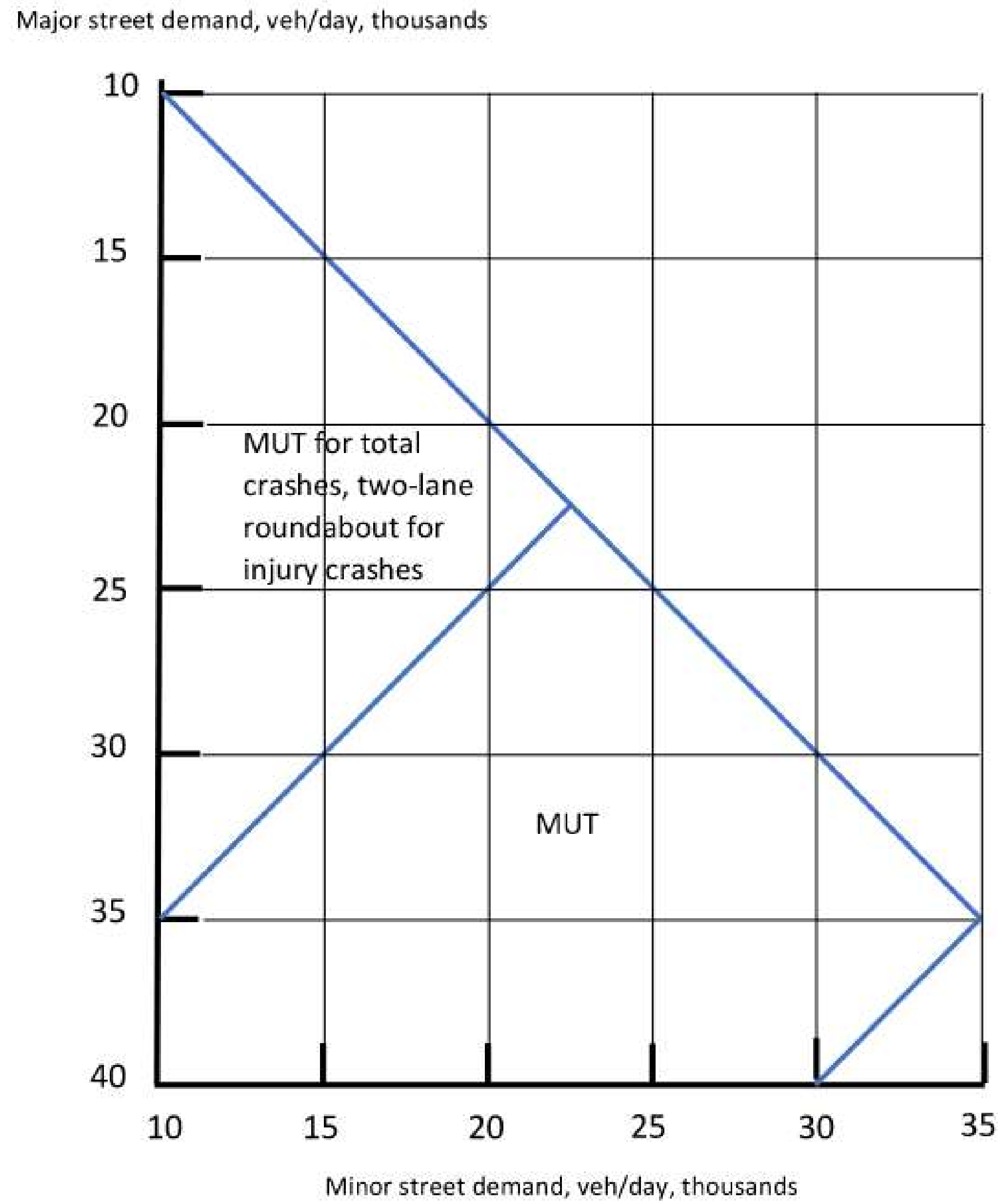

Intersection Type that Maximizes Safety Design for a Four-Lane Major Street Meeting a Four-Lane Minor Street

(NCDOT - Selecting Optimum Intersection or Interchange Alternatives)

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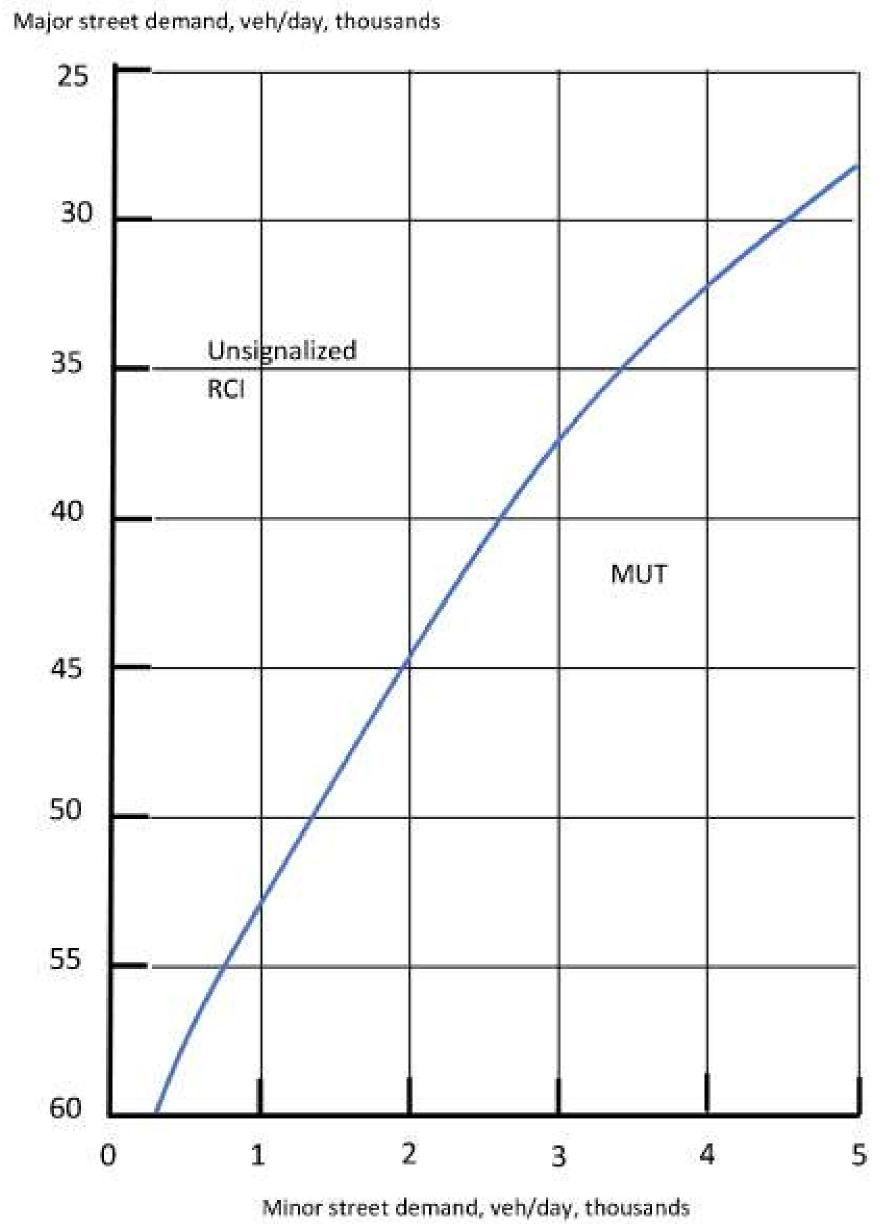

Intersection Type that Maximizes Safety Design for a Six-Lane Major Street Meeting a Two-Lane Minor Street
(NCDOT - Selecting Optimum Intersection or Interchange Alternatives)

233.5.2 Traditional Intersections

Contents

Figures

233.5.2.1 Traditional Intersection Summary

Traditional intersections, which may also be referred to as conventional or standard intersections, allow direct movements (left, through, and right) on all approaches. These intersections may operate under traffic signal, all-way stop, or two-way stop control.

233.5.2.2 Traditional Intersection Applicability

Traditional intersections may be considered across a wide variety of contexts. Several articles of EPG 900 (Traffic Control) provide specific directional guidelines for when a given traffic control device may be used. Specifically, EPG 903.5.4 provides guidance on stop sign applications, and EPG 902.3 provides guidance for traffic signal installations.

233.5.2.3 Traditional Operational Based Criteria

There are several daily volumetric thresholds at which a given traffic control method at a traditional intersection may become infeasible and require further improvements.

	Maximum Major Street Volume (vpd)	Maximum Total Entering Volume (vpd)
Two-Way Stop Control (One Through Lane)	14,000	
All-Way Stop Control (One Through Lane)		15,000
Signalized Intersection with Left-Turn Lanes		30,000
Signalized Intersection with Left- and Right-Turn Lanes		40,000

233.5.2.4 Traditional Intersection Advantages and Disadvantages

Advantages

- This commonly used intersection layout leads to familiarity and intuitiveness for all users.

Disadvantages

- Safety issues may arise under certain geometric conditions, such as when slip lanes are included or left -turn visibility is obstructed by opposing movements.
- Two-way stop control is ineffective at serving high minor roadway volumes.
- All-way stop control has the lowest capacity of any intersection type.

233.5.2.5 Traditional Intersection Pedestrian and Other Nonmotorized User Considerations

Under a two-way stop controlled condition, there are no protected movements across the major roadway without supplemental traffic control devices. At signalized intersections, long traffic signal cycle lengths may limit crossing opportunities and lead to poor pedestrian levels of service. At both signalized and unsignalized intersections, the presence of channelizing and median islands may simplify movements for pedestrians by minimizing the number of conflicting movements for the pedestrians.

233.5.2.6 Traditional Intersection Costs and Maintenance

Due to the widespread use of traditional intersections, the costs associated with construction and maintenance are often predictable. Stop controlled intersections are typically low cost, and signal controlled intersections often have reasonably estimated costs. Signalized intersections require additional equipment and timing maintenance.

233.5.2.7 Traditional Intersection Conflict Points

Conflict points for a 4-leg traditional intersection may be viewed in the table below and in the Traditional Intersection Conflict Point Diagram.

Conflict Point Type	Conflict Points
Vehicle-Vehicle - Total	32
Vehicle-Vehicle - Crossing	16
Vehicle-Vehicle - Merging	8
Vehicle-Vehicle - Diverging	8
Nonmotorized-Vehicle	24

233.5.2.8 Traditional Intersection Additional Resources

EPG 233.2 At-Grade Intersections with Stop and Yield Control

EPG 233.4 At-Grade Intersections with Signal Control

EPG 902 Signals

EPG 940 Access Management

Traditional Intersection Quick Reference Table

Other Names	Conventional; Standard		
Distinguishing Features and Key Considerations	• Intersection allows direct movements (left, through, right) on all approaches. • Intersection may operate under traffic signal, all-way stop, or two-way stop control.		
Applicability	• Traditional intersections are considered across a wide range of contexts. • The MUTCD provides clear guidance for when signalized control is warranted.		
Operational Based Criteria		Maximum Major Street Volume (vpd)	Maximum Total Entering Volume (vpd)
	Two-Way Stop Control (One Through Lane)	14,000	
	All-Way Stop Control (One Through Lane)		15,000
	Signalized Intersection with Left-Turn Lanes		30,000
	Signalized Intersection with Left- and Right-Turn Lanes		40,000
Advantages	• This commonly used layout leads to familiarity and intuitiveness for all users.		
Disadvantages	• Safety issues may arise under certain geometric conditions, such as when slip lanes are included or left-turn visibility is obstructed by opposing movements. • Two-way stop control is ineffective at serving high minor roadway volumes. • All-way stop control has the lowest capacity of any intersection type.		
Pedestrian and Other Nonmotorized User Considerations	• One-stage or two-stage crossings may occur depending on the presence of refuge island. • There are no protected movements across the major road under the two-way stop control condition. • Long signal cycle lengths may limit crossing opportunities.		
Costs and Maintenance	• Stop control may be low cost, and signalized control has predictable cost. • Signalized intersections require equipment and timing maintenance.		
Conflict Points	Vehicle-Vehicle - Total	32	
	Vehicle-Vehicle - Crossing	16	
	Vehicle-Vehicle - Merging	8	
	Vehicle-Vehicle - Diverging	8	
	Nonmotorized-Vehicle	24	

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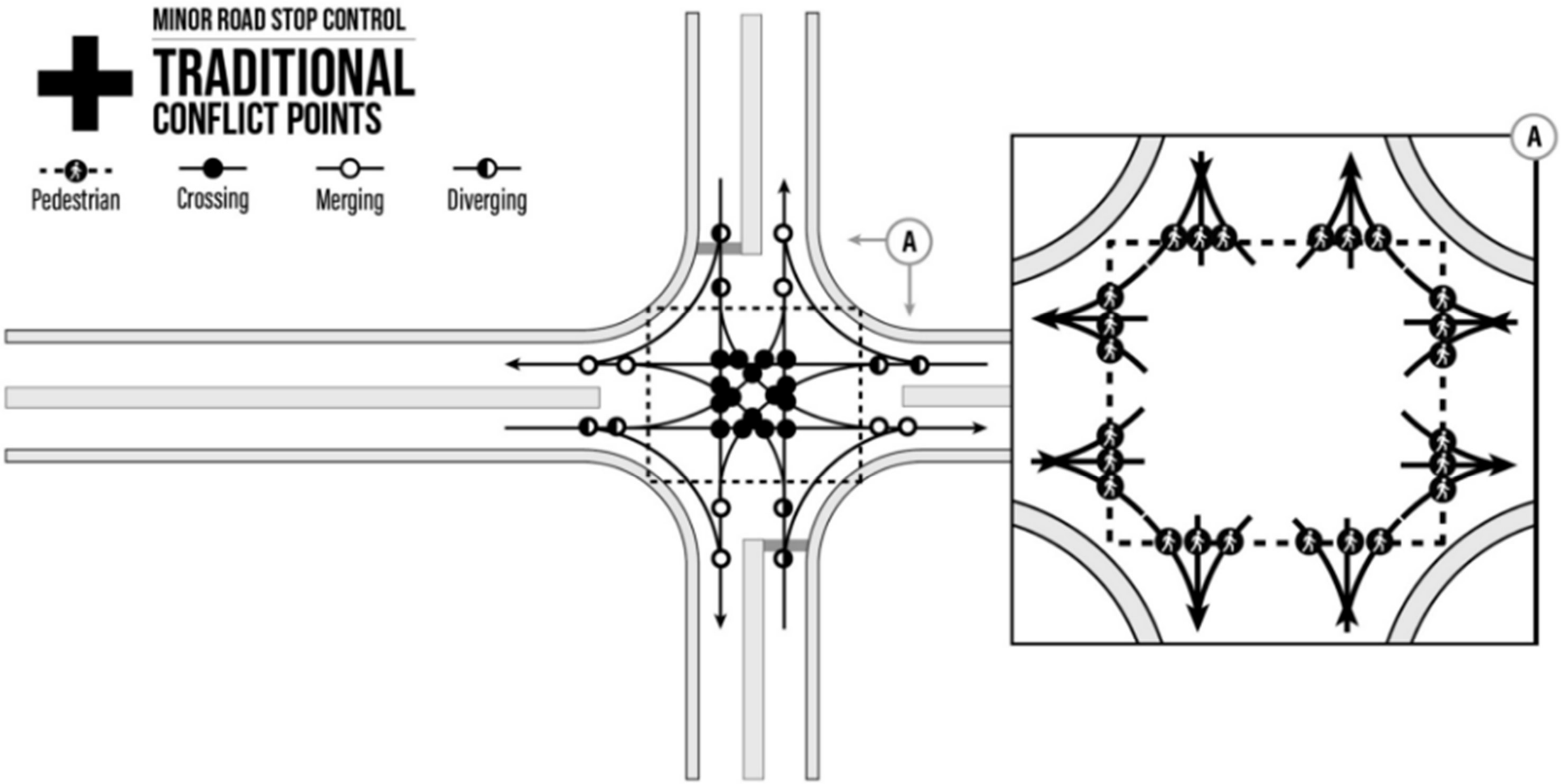

Diagram of Movement-Based Conflict Points for Traditional Minor Road Stop Controlled Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

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233.5.3 Roundabouts

Contents

Figures

233.5.3.1 Roundabout Summary

Roundabouts remove direct left-turn movements on all intersection approaches, which typically operate under yield control. All vehicular movements circulate counter-clockwise around a center island. Where appropriate, right-turn bypass lanes may be added for potential capacity or operational benefits. Roundabouts may either be placed at a single intersection or be placed in series along a corridor.

Information included as part of this article does not replace information provided in EPG 233.3, which provides specific guidance and information on roundabouts.

233.5.3.2 Roundabout Applicability

Roundabouts may be applicable where high frequencies of left-turn or right-angle crashes are being experienced, or in some situations where there are heavy traffic delays. Furthermore, roundabouts may work well in situations with non-conventional approach geometry (i.e., skewed intersections, more than four legs, etc.). At some intersections, roundabouts may also be used as an alternative to a traffic signal installation.

233.5.3.3 Roundabout Operational Based Criteria

There are several volumetric thresholds for which a given roundabout type may be viable. One available threshold estimates the hourly sum of the entering flow on a given approach with the conflicting circulating flow, while another threshold approximates the maximum daily capacity of a given roundabout configuration. These thresholds are outlined in both the table below and in Planning Level Practical Estimates for Roundabouts Using Peak Hour Volumes.

Roundabout Type	Sum of Entering and Conflicting Flows (vph)	Maximum Daily Capacity (vpd)
Mini		10,000

Urban Compact		15,000
Urban Single-Lane	1,000-1,300	20,000-25,000
Urban Double-Lane	1,300-2,300	40,000-50,000
Rural Single-Lane	1,000-1,300	20,000-25,000
Rural Double-Lane	1,300-2,300	40,000-50,000

233.5.3.4 Roundabout Advantages and Disadvantages

Advantages

- Reduces overall conflict points and eliminates left-turn conflicts.
- Geometry and yield control leads to reduced vehicle speeds and crash severity, especially for fatal/injury crashes as compared to signalized control.
- Provides an opportunity for a transitional zone along a corridor, facilitates access management, and provides traffic calming.

Disadvantages

- Cannot provide explicit priority for specific users without supplemental traffic control devices.
- Increase in single-vehicle and fixed-object crashes as compared to other intersection treatments.
- Implementation of multi-lane roundabouts may create unique challenges, such as path overlap and higher crash rates.
- Multi-lane roundabouts may require supplemental lane markings and wayfinding signage for correct utilization.
- Roundabouts operating near volume/capacity thresholds lose efficiency or may even gridlock.

233.5.3.5 Roundabout Pedestrian and Other Nonmotorized User Considerations

At roundabouts, pedestrians typically only cross one direction of conflicting traffic at a time, and splitter islands provide refuge for two-stage crossings. Multilane approaches to roundabouts may require additional pedestrian protective measures, such as activated signals, beacons, or raised crosswalks. Cyclists may be provided multiple options to navigate through roundabouts based on skill and comfort level. Pedestrian users with visual impairments may have navigational difficulties at roundabouts due to the non-traditional vehicular movements and multi-stage crossings required.

233.5.3.6 Roundabout Costs and Maintenance

Roundabouts have comparable, or sometimes higher, initial geometric costs when compared to a new signalized intersection with auxiliary turn lanes. Some roundabouts may require more right-of-way than a traditional intersection, leading to increased acquisition costs. Additionally, some roundabouts may have costs associated with aesthetics and landscaping maintenance. Roundabouts eliminate the need for ongoing traffic signal equipment, maintenance, and power supply costs.

233.5.3.7 Roundabout Conflict Points

Conflict points for a 4-leg roundabout may be viewed in the table below and in the Roundabout Conflict Point Diagram.

Conflict Point Type	Conflict Points Roundabout (Traditional Intersection)

Vehicle-Vehicle - Total	20 (32)
Vehicle-Vehicle - Crossing	4 (16)
Vehicle-Vehicle - Merging	8 (8)
Vehicle-Vehicle - Diverging	8 (8)
Nonmotorized-Vehicle	8 (24)

233.5.3.8 High Speed Roundabout Design Considerations

Roundabouts located on high-speed roadways may require special geometric and safety design considerations. Appropriate design related measures may include, but are not limited to:

- Provide a minimum of stopping sight distance to the entry point based on approach operating speed.
- Align approach roadways and vertical profiles to make the central island conspicuous with landscaping and sight-blocking amenities.
- Extend splitter islands at least 200’ upstream to a point at which entering drivers are expected to begin decelerating.
- Use landscaping on extended splitter islands and roadside to create a tunneling effect for approaching vehicles.
- Provide roadway illumination in transition to the roundabout.
- Use proper signage and pavement markings to advise the appropriate speed and path for approaching vehicles.

233.5.3.9 Roundabout Additional Resources

EPG 620.3 Roundabout Markings

EPG 903.6.37 Intersection Warning Signs

MoDOT Roundabouts

NCHRP 1043 Guide for Roundabouts

FHWA Roundabouts

Roundabout Quick Reference Table

Distinguishing Features and Key Considerations	• Direct left-turns are removed from all approaches. • Roundabouts may be installed as individual intersections or in a series. • Right-turn bypass lanes may be added. • All approaches typically operate under yield control.		
Applicability	• Where high left-turn or right-angle crashes are being experienced. • Where there are heavy traffic delays. • In situations with non-conventional approach geometry (i.e., skewed intersections, more than four legs, etc.). • May be used as an alternative to traffic signal installation at some intersections.		
Operational Based Criteria	Roundabout Type	Sum of Entering and Conflicting Flows (vph)	Maximum Daily Capacity (vpd)
	Mini		10,000
	Urban Compact		15,000
	Urban Single-Lane	1,000-1,300	20,000-25,000
	Urban Double-Lane	1,300-2,300	40,000-50,000
	Rural Single-Lane	1,000-1,300	20,000-25,000
	Rural Double-Lane	1,300-2,300	40,000-50,000
Advantages	• Reduces overall conflict points and eliminates left-turn conflicts. • Geometry and yield control leads to reduced vehicle speeds and crash severity, especially for fatal/injury crashes compared to signalized control. • Provides an opportunity for a transitional zone along a corridor, facilitates access management, and provides traffic calming.		
Disadvantages	• Cannot provide explicit priority for specific users without supplemental traffic control devices. • Increase in single-vehicle and fixed-object crashes compared to other intersection treatments. • Implementation of multi-lane roundabouts may create unique challenges, such as path overlap and higher crash rates. • Multi-lane roundabouts may require supplemental lane markings and wayfinding signage for correct utilization. • Roundabouts operating near volume / capacity thresholds lose efficiency or may even gridlock.		
Pedestrian and Other Nonmotorized User Considerations	• Splitter islands provide refuge for two-stage crossings. • Pedestrians only cross one direction of conflicting traffic at a time. • Multiple options for cyclists to navigate based on skill and comfort level. • Potential navigation difficulty for pedestrian users with visual impairments. • Multilane approaches to roundabouts may require additional pedestrian protective measures, such as activated signals, beacons, or raised crosswalks.		
Costs and Maintenance	• Comparable (or higher) initial geometric cost to new signalized intersection with turn lanes. • Some roundabouts may require more right-of-way than a traditional intersection. • Elimination of traffic signal equipment, maintenance, and power costs. • May require landscaping maintenance.		

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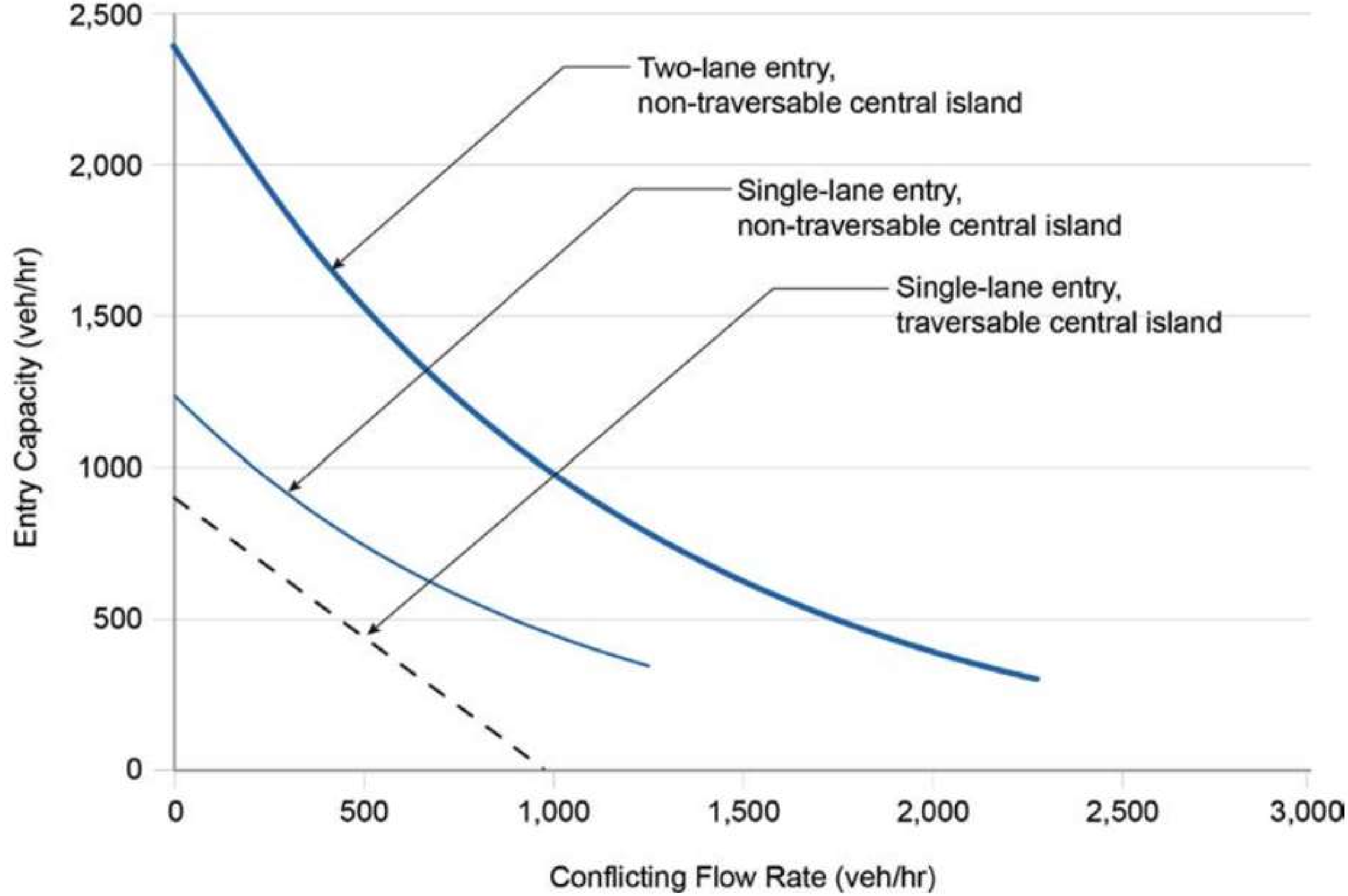
Conflict Points (Compared to Traditional)	Vehicle-Vehicle - Total	20 (32)
	Vehicle-Vehicle - Crossing	4 (16)
	Vehicle-Vehicle - Merging	8 (8)
	Vehicle-Vehicle - Diverging	8 (8)
	Nonmotorized-Vehicle	8 (24)
High Speed Design Considerations	• Provide a minimum of stopping sight distance to the entry point based on approach operating speed. • Align approach roadways and vertical profiles to make the central island conspicuous with landscaping and sight-blocking amenities. • Extend splitter islands at least 200’ upstream to a point at which entering drivers are expected to begin decelerating. • Use landscaping on extended splitter islands and roadside to create a tunneling effect for approaching vehicles. • Provide roadway illumination in transition to the roundabout. • Use proper signage and pavement markings to advise the appropriate speed and path for approaching vehicles.	



NOTE: Practical capacity is assumed to be 90 percent of maximum capacity. Conclusions not valid at planning level for conflicting flow rates above 1,250 veh/hr for a single-lane circulatory roadway and 2,300 veh/hr for a two-lane circulatory roadway. Values beyond these practical limits may be possible, but further analysis is recommended. SOURCE: Derived from HCM (*1*) and Lochrane et al. (*9*).

Planning Level Practical Capacity Estimates for Roundabouts Using Peak Hour Volumes
(NCHRP 1043 – Guide for Roundabouts)

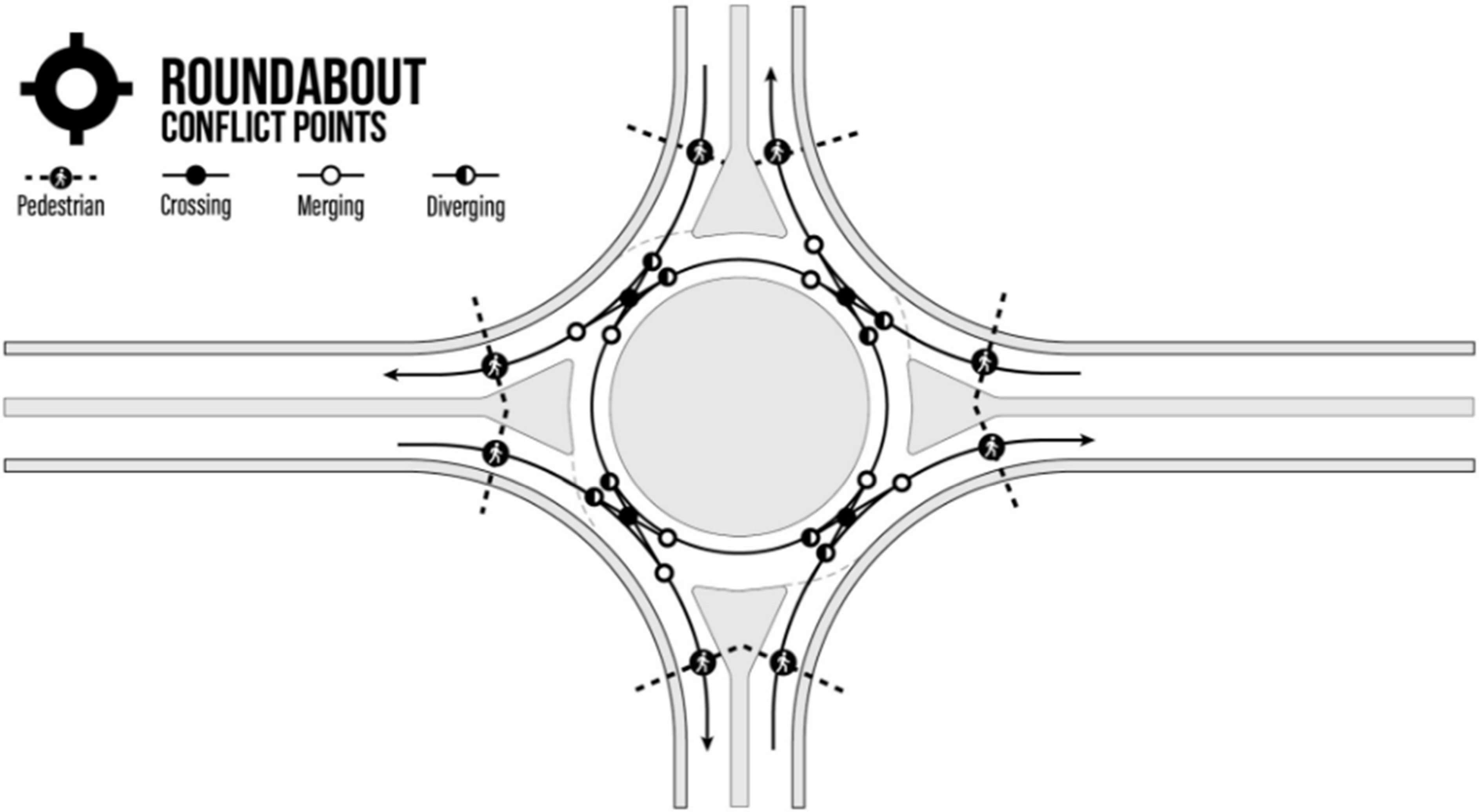


Diagram of Movement-Based Conflict Points for Roundabout Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

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233.5.4 J-Turns

Contents

Figures

233.5.4.1 J-Turn Summary

J-Turns may also be referred to as Restricted Crossing U-Turns (RCUT), Superstreets, or Reduced Conflict Intersections (RCI). J-Turns allow direct left-turn and through movements from the major roadway but divert through and left--turn movements from the minor roadway to a downstream U--turn location. The primary intersection in a J-turn configuration may operate under either traffic signal or yield control, while the downstream U--turn may operate under signal, stop, or yield control.

Information included as part of this article does not replace information provided in EPG 233.2.6, which provides additional guidance and information on J-Turns.

233.5.4.2 J-Turn Applicability

J-Turns are most applicable in locations where there are low left-turn and through volumes from the minor road or where there are heavy through and left turn volumes on major road approaches. J--turns may also be appropriate in locations where a high frequency of right-angle crashes is experienced.

233.5.4.3 J-Turn Operational Based Criteria

There are several volumetric thresholds at which J-Turns may become a more feasible design option relative to another alternative or traditional intersection type. In addition to the table below, the daily volume thresholds for signalized and unsignalized J-Turns based on major and minor street demands are summarized visually in Feasible Demand Space for J-Turns. Additional volumetric thresholds utilize the minor road approach volume ratio or combined volumes at the crossroad or downstream U-turn locations.

Signalized J-Turn Minor Street Demand Threshold	2,250 vph (25,000 vpd)
Unsignalized J-Turn Minor Street Demand Threshold	450 vph (5,000 vpd)
Minor Road Approach Volume Ratio to Total Entering Intersection Volume	Less Than 0.20
Combined Volume of Through + Merging Movement (From Crossroad or U-Turn Entry)	Less Than 1,800-1,900 veh/hr/ln

233.5.4.4 J-Turn Advantages and Disadvantages

Advantages

- Eliminates most crossing conflict points.
- Reduces turning and angle crashes and reduces overall crash severity.
- Increases intersection throughput by approximately 30%.
- Lower exposure time for large vehicles compared to traditional two-way stop-controlled intersections.
- May be implemented as a signalized or unsignalized intersection.
- May be a treatment at a single intersection or may be applied to multiple intersections along a corridor.

Disadvantages

- May require additional right-of-way to construct supplemental turning areas (i.e., loons) or a wider median.
- Prioritizes major road movements at the cost of minor road movements, which have additional travel distance and time.
- Not a suitable treatment at the intersection of arterials, where two roadways have balanced and high traffic volumes.

233.5.4.5 J-Turn Pedestrian and Other Nonmotorized User Considerations

J-Turns typically utilize a Z-pattern pedestrian crossing configuration, which results in non-traditional and indirect pedestrian movements. If the primary intersection is signalized, shorter cycle lengths may provide more frequent pedestrian crossing opportunities. Additionally, while the wider intersection footprint lengthens pedestrian crossing distances, medians may provide refuge for multistage pedestrian crossings. Midblock crossings may also be provided near downstream U--turn crossovers.

The non-traditional layout of a J-Turn intersection allows for various bicycle treatments to be provided, some of which may depend on the intended riding location of cyclists.

J-Turns may pose potential navigational difficulties for pedestrian users with visual impairments.

233.5.4.6 J-Turn Costs and Maintenance

Unsignalized J-Turns eliminate additional costs associated with traffic signal equipment, ongoing maintenance, and required power supply. When compared to a traditional intersection configuration, the construction of a J-Turn intersection is typically 29%-34% higher, according to FHWA estimates. Additional project costs may be associated with increased right-of-way acquisition or median widening to accommodate U-turns.

233.5.4.7 J-Turn Conflict Points

Conflict points for both signalized and unsignalized configurations of a J-Turn intersection may be viewed in the table below and in the [J-Turn Conflict Point Diagrams](#).

Conflict Point Type	Conflict Points J-Turn (Traditional Intersection)
Vehicle-Vehicle - Total	14 (32)
Vehicle-Vehicle - Crossing	2 (16)
Vehicle-Vehicle - Merging	6 (8)

Vehicle-Vehicle - Diverging	6 (8)
Nonmotorized-Vehicle	10 (24)

233.5.4.8 J-Turn Additional Resources

MoDOT J-Turns

FHWA Reduced Left-Turn Conflict Intersections

FHWA Alternative Intersections/Interchanges: Informational Report (AIIR) Chapter 4

J-Turn Quick Reference Table

Other Names	Restricted Crossing U-Turn (RCUT); Superstreet; Reduced Conflict Intersection (RCI)	
Distinguishing Features and Key Considerations	• Allows direct left-turns and through movements from the major roadway. • Through and left movements from the minor road are redirected to a downstream U-turn. • In an unsignalized J-turn, minor road movements are yield controlled. • The primary intersection movements may be signal controlled. • Downstream U-turns may operate under signal, stop, or yield control.	
Applicability	• Where there are low left-turn and through volumes from the minor road. • Where there is a high frequency of right-angle crashes. • Where there are heavy through and left turn volumes on major road approaches.	
Operational Based Criteria	Signalized J-Turn Minor Street Demand Threshold	2,250 vph (25,000 vpd)
	Unsignalized J-Turn Minor Street Demand Threshold	450 vph (5,000 vpd)
	Minor Road Approach Volume Ratio to Total Entering Intersection Volume	Less Than 0.20
	Combined Volume of Through + Merging Movement (From Crossroad or U-Turn Entry)	Less Than 1,800-1,900 veh/hr/ln
Advantages	• Eliminates most crossing conflict points. • Reduces turning and angle crashes, and reduces overall crash severity. • Increases intersection throughput by approximately 30%. • Lower exposure time for large vehicles compared to traditional two-way stop-controlled intersections. • May be implemented as a signalized or unsignalized intersection. • May be a treatment at a single intersection or may be applied to multiple intersections along a corridor.	
Disadvantages	• May require additional right-of-way to construct supplemental turning areas (i.e., loons) or a wider median. • Prioritizes major road movements at cost of minor road movements, which have additional travel distance and time. • Not a suitable treatment at the intersection of arterials, where two roadways have balanced and high traffic volumes.	
Pedestrian and Other Nonmotorized User Considerations	• Z-crossing is the most common pedestrian configuration, which results in non-traditional and indirect pedestrian movements. • Shorter cycle lengths provide more frequent crossing opportunities. • Wider intersection footprint lengthens crossings, but medians may provide refuge for multistage crossing. • Midblock crossings may be provided at U-turn crossovers. • Various bicycle treatments are possible, depending on the intended riding location of users. • Potential navigational difficulty for pedestrian users with visual impairments.	
Costs and Maintenance	• Construction costs are higher than traditional intersections. (FHWA Estimate: 29%-34%) • Additional costs may be associated with right-of-way acquisition or median widening. • Eliminates traffic signal equipment, maintenance, and power costs for the unsignalized configuration.	
Conflict Points (Compared to Traditional)	Vehicle-Vehicle - Total	14 (32)
	Vehicle-Vehicle - Crossing	2 (16)
	Vehicle-Vehicle - Merging	6 (8)
	Vehicle-Vehicle - Diverging	6 (8)
	Nonmotorized-Vehicle	10 (24)

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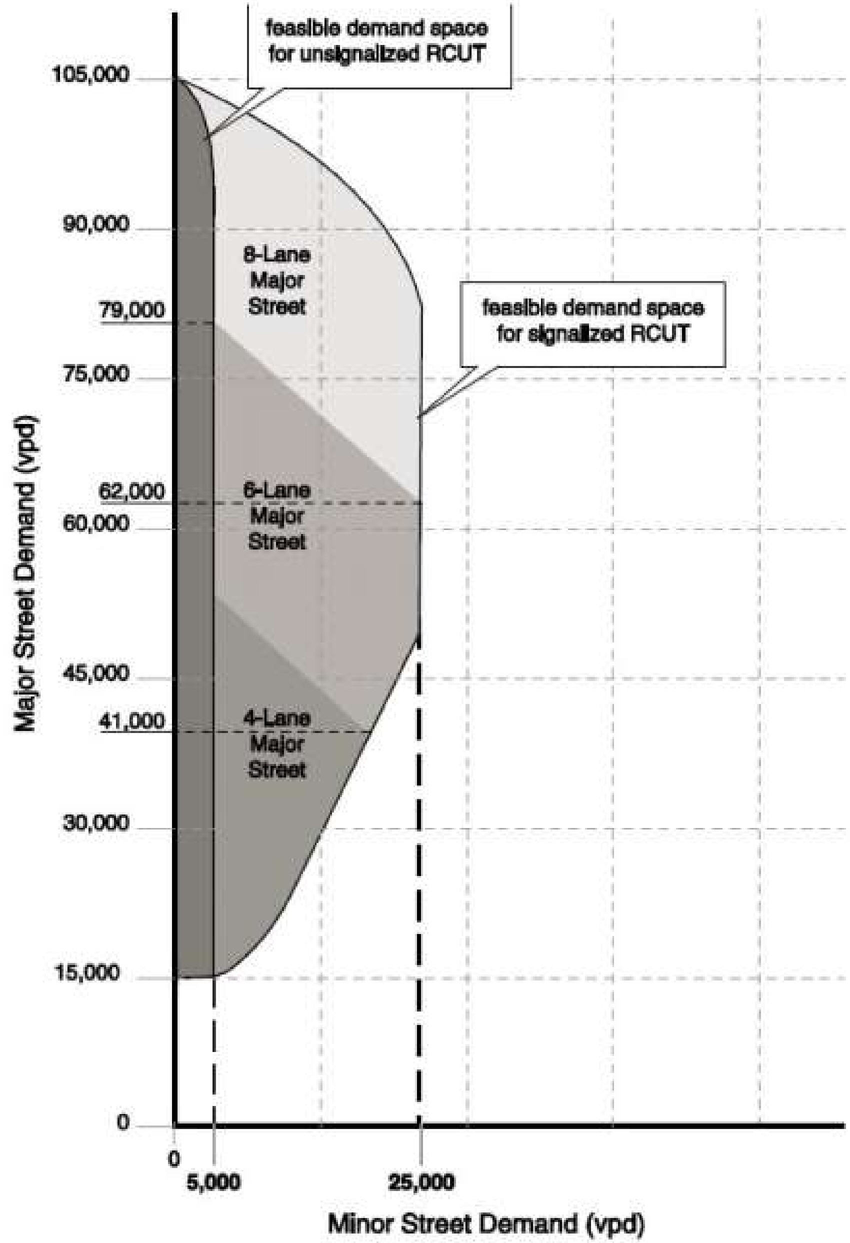

Feasible Demand Space for Signalized RCUT (J-Turn)
(FHWA – RCUT Informational Guide)

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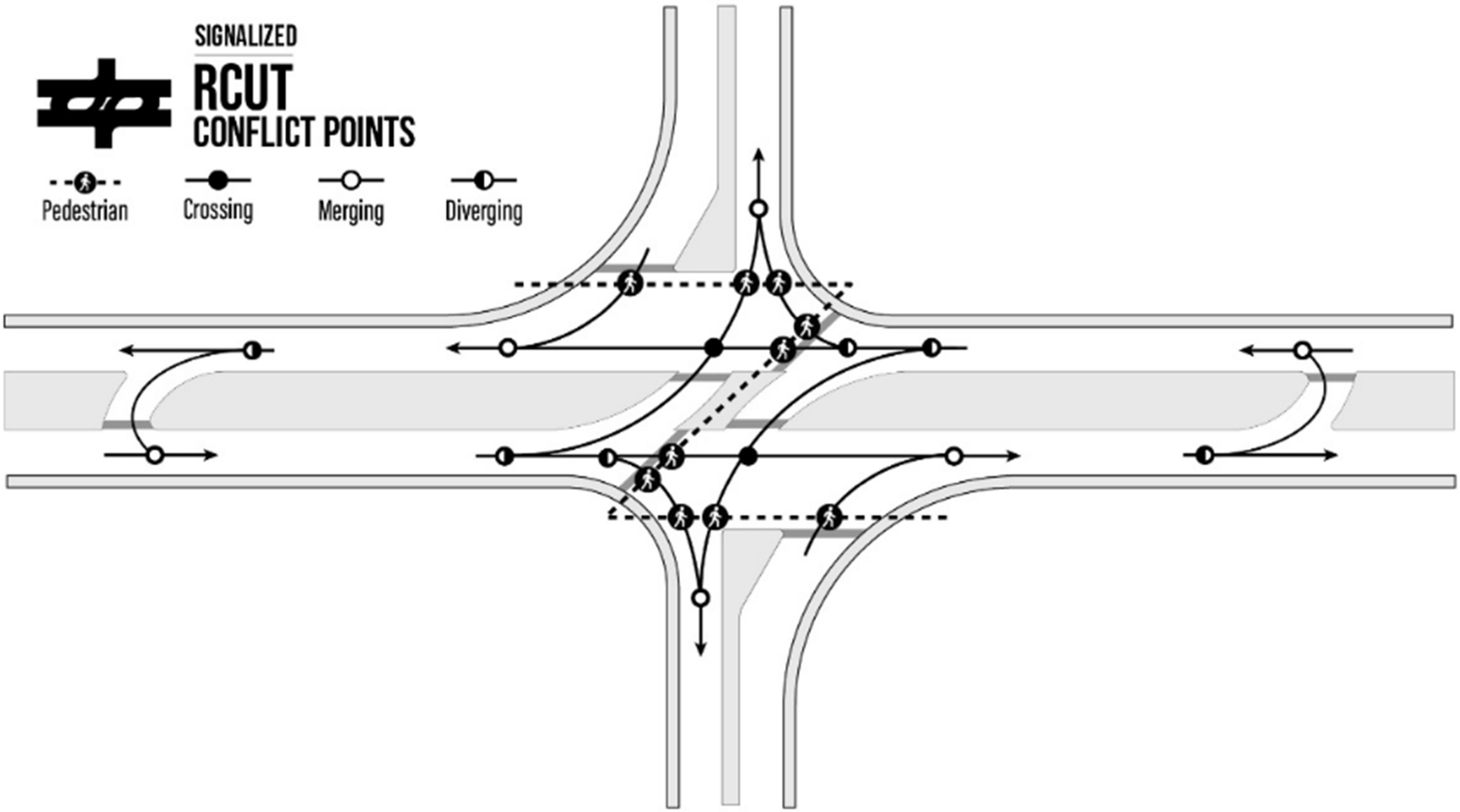

Diagram of Movement-Based Conflict Points for Signalized RCUT (J-Turn) Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

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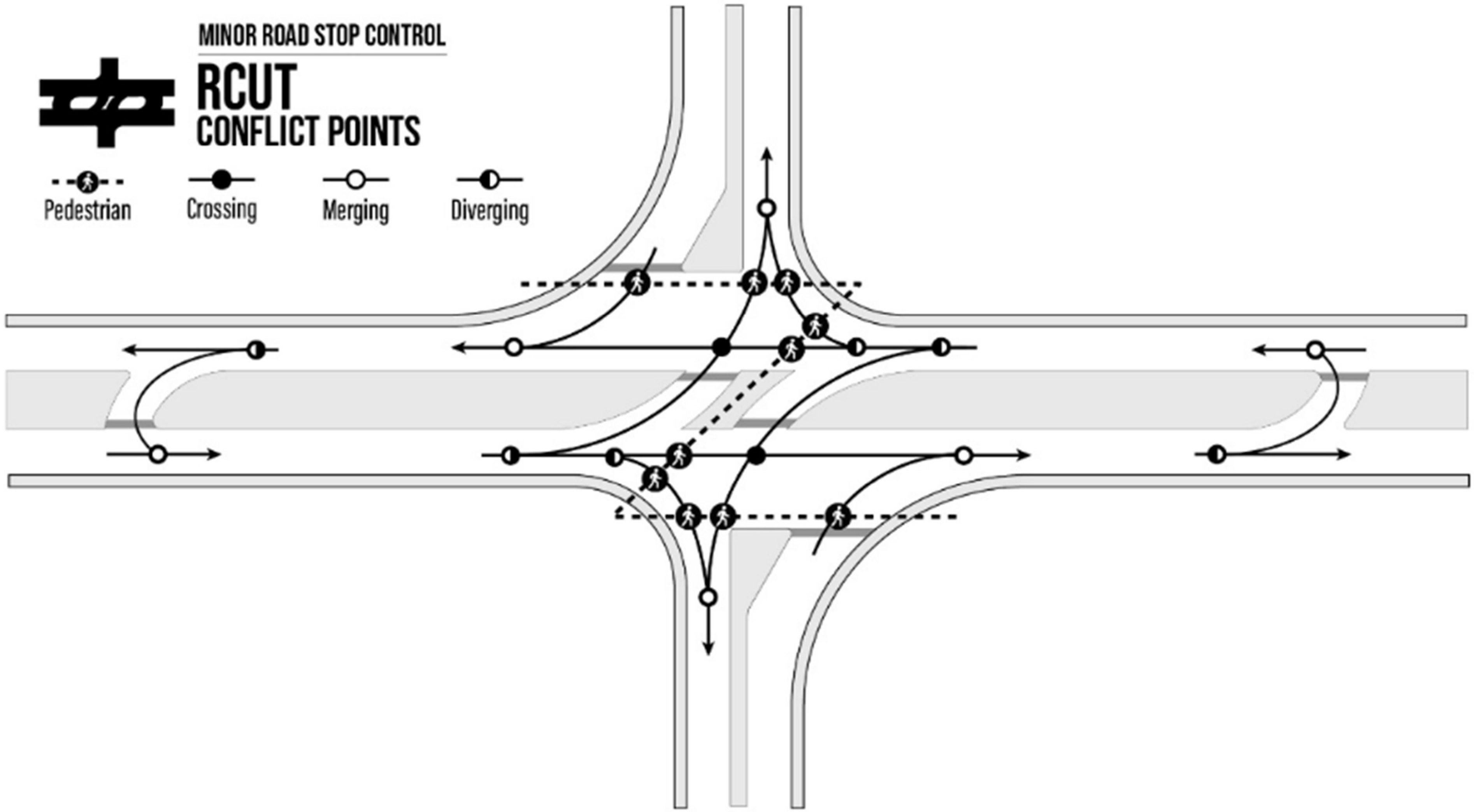

Diagram of Movement-Based Conflict Points for Unsignalized RCUT (J-Turn) Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

Disclaimer: Information provided as part of this document is intended for policy guidance and initial planning evaluation. Information presented in this document does not supersede detailed requirements set by MoDOT for further analysis of specific projects or proposed improvements.

233.5.5 Median U-Turns (MUT)

Contents

Figures

233.5.5.1 MUT Summary

A Median U-Turn (MUT) may also be referred to as a ThrU-Turn, Indirect Left, Express Left, or Michigan Left/Loon. MUTs remove direct left-turn movements from both the major and minor roadways and replace them with downstream U-turn maneuvers. Through and right-turn movements remain at the main intersection for both the major and minor roadways. The main intersection is signalized, while the downstream U-turns may operate under yield, stop, or signal control.

233.5.5.2 MUT Applicability

MUTs are most applicable in locations where there is a high proportion of through volumes to left -turning volumes, or where there are heavy through volumes and only moderate left -turn volumes on all approaches. From a safety perspective, MUTs may be appropriate where there is a high frequency of right-angle or rear-end crashes. Additionally, corridors with wide medians to accommodate downstream U-Turn maneuvers may be appropriate candidates for MUTs.

233.5.5.3 MUT Operational Based Criteria

There are several volumetric thresholds at which MUTs may become a more feasible design option relative to another alternative or traditional intersection type. These various thresholds shown in the table below may be based on hourly volumes per lane or intersection approach, volume/capacity ratio comparisons, or left -turn movement percentages.

Major street volumes of 300-1,900 veh/hr/ln and minor street volumes of 100-500 veh/hr/ln.
Left-turning volume < 400 veh/hr/ln and opposing through volume > 700 veh/hr/ln on two opposing approaches.
Volume to Capacity Ratio > 0.8 on two opposing approaches.
Left-turn approach volume < 20% of total approach volume on all approaches.
Cross product of hourly left-turn and opposing through volume > 150,000 on two opposing approaches.

233.5.5.4 MUT Advantages and Disadvantages

Advantages

- Reduces crossing conflict points.
- Increases capacity and improves operational efficiency.
- May reduce crashes by 20%-50%.
- Typically increases throughput by 30%-45%.
- Better suited for high minor road through volumes than a J-turn intersection.
- May be a treatment at a single intersection or may be applied to multiple intersections along a corridor.

Disadvantages

- Has a lower overall intersection capacity at high left-turn demands.
- Left turns have longer travel times and delays.
- No geometric barriers are provided to prohibit left-turn movements at main intersection.
- May require additional right-of-way to construct supplemental turning areas (i.e., loons) or a wider median.

233.5.5.5 MUT Pedestrian and Other Nonmotorized User Considerations

MUTs typically utilize a similar pedestrian crossing pattern to a traditional intersection. Shorter traffic signal cycle lengths at the primary intersection may provide more frequent pedestrian crossing opportunities. Additionally, while the wider intersection footprint lengthens pedestrian crossing distances, medians of the major road may be utilized to provide refuge for multistage pedestrian crossings. Midblock crossings may also be provided at or near the downstream U--turn crossovers.

The non-traditional layout of a MUT allows for various bicycle treatments, some of which may depend on the intended riding location of cyclists.

MUTs may pose potential navigational difficulties for pedestrian users with visual impairments.

233.5.5.6 MUT Costs and Maintenance

MUTs are typically more expensive than traditional intersection types. Additional costs may be associated with right-of-way acquisition or median widening.

233.5.5.7 MUT Conflict Points

Conflict points for both signalized and unsignalized configurations of a MUT intersection may be viewed in the table below and in the MUT Conflict Point Diagram.

Conflict Point Type	Conflict Points MUT (Traditional Intersection)
Vehicle-Vehicle - Total	16 (32)
Vehicle-Vehicle - Crossing	4 (16)
Vehicle-Vehicle - Merging	6 (8)
Vehicle-Vehicle - Diverging	6 (8)
Nonmotorized-Vehicle	16 (24)

233.5.5.8 MUT Additional Resources

FHWA Reduced Left-Turn Conflict Intersections

FHWA Alternative Intersections/Interchanges: Informational Report (AIIR) Chapter 3

Median U-Turn (MUT) Quick Reference Table

Other Names	ThrU-Turn; Indirect Left; Express Left; Michigan Left/Loon	
Distinguishing Features and Key Considerations	• Removes direct left-turns from major and minor roads. • Replaces left-turns at the main intersection with downstream U-turns. • The main intersection is signalized, while the downstream U-turns may operate under yield, stop, or signal control.	
Applicability	• Where there is a high proportion of through volumes to left-turning volumes. • Where there are heavy through volumes and moderate left-turn volumes on all approaches. • Where there is a high frequency of right-angle or rear-end crashes. • Where there are corridors with wide medians.	
Operational Based Criteria	Major street volumes of 300-1,900 veh/hr/ln and minor street volumes of 100-500 veh/hr/ln.	
	Left-turning volume < 400 veh/hr/ln and opposing through volume > 700 veh/hr/ln on two opposing approaches.	
	Volume to Capacity Ratio > 0.8 on two opposing approaches.	
	Left-turn approach volume < 20% of total approach volume on all approaches.	
	Cross product of hourly left-turn and opposing through volumes > 150,000 on two opposing approaches.	
Advantages	• Reduces crossing conflict points. • Increases capacity and improves operational efficiency. • Reduces crashes by 20%-50%. • Typically increases throughput by 30%-45%. • Better suited for high minor road through volumes than a J-turn intersection. • May be a treatment at a single intersection or may be applied to multiple intersections along a corridor.	
Disadvantages	• Has a lower overall intersection capacity at high left-turn demands. • Left turns have longer travel times and delays. • No geometric barriers are provided to prohibit left-turn movements at main intersection. • May require additional right-of-way to construct supplemental turning areas (i.e., loons) or a wider median.	
Pedestrian and Other Nonmotorized User Considerations	• Wider footprint lengthens crossings, but major road median may provide a refuge for multistage crossing. • Shorter cycle length leads to more frequent crossing opportunities. • Pedestrian crossing movements may be provided in similar manner to a traditional intersection. • Midblock crossings may be provided at U-turn crossovers. • Various bicycle treatments are possible, depending on the intended riding location of users. • Potential navigational difficulty for pedestrian users with visual impairments.	
Costs and Maintenance	• Generally, more expensive than a traditional signalized intersection. • Additional cost may be associated with right-of-way acquisition or median widening.	
Conflict Points (Compared to Traditional)	Vehicle-Vehicle - Total	16 (32)
	Vehicle-Vehicle - Crossing	4 (16)
	Vehicle-Vehicle - Merging	6 (8)
	Vehicle-Vehicle - Diverging	6 (8)
	Nonmotorized-Vehicle	16 (24)

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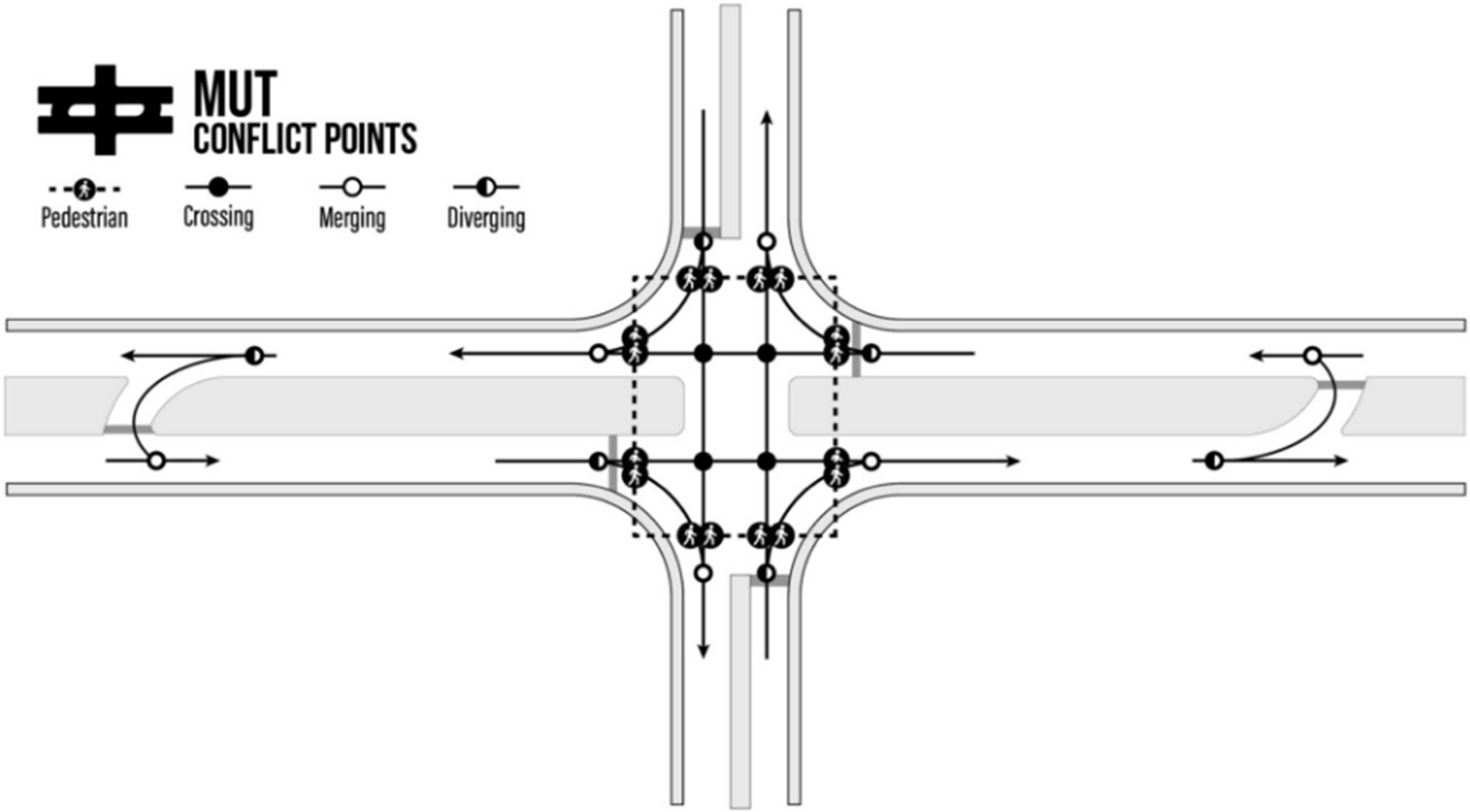

Diagram of Movement-Based Conflict Points for MUT Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

233.5.6 Displaced Left-Turns (DLT)

Contents

Figures

233.5.6.1 DLT Summary

A Displaced Left-Turn (DLT) may also be referred to as a Continuous Flow Intersection (CFI), Partial Displaced Left-Turn (PDLT), or Crossover Displaced Left-Turn (XDLT). In a DLT intersection, left-turns cross over to the left side of the roadway at secondary intersections upstream of the main junction. These displaced left-turns operate simultaneously with through movements at the main intersection without conflict. Both the main junction and secondary crossover intersections are signalized.

233.5.6.2 DLT Applicability

DLTs are most applicable in locations where there are heavy through and left-turning volumes, or where left-turn queues exceed existing storage distances. From a safety perspective, DLTs may be most appropriate where there is high left-turn crash frequency. DLTs are most applicable in urban or suburban locations and are typically not appropriate for rural locations.

233.5.6.3 DLT Operational Based Criteria

There are several volumetric thresholds at which DLTs may become a more feasible design option relative to another alternative or traditional intersection type. These various thresholds may be based on total entering volumes for the intersection, hourly volumes per lane or intersection approach, or volume/capacity ratio comparisons and are shown in the table below.

Full DLT Maximum Intersection Volume	Max 12,000 vph
Partial DLT Maximum Intersection Volume	Max 10,000 vph
Major street volume > 2,000 veh/hr/ln and minor street volume > 300 veh/hr/ln.	
Mainline left-turning volumes > 250 veh/hr/ln and opposing through volumes > 500 veh/hr/ln on two opposing approaches.	
Cross product of hourly left-turns and opposing through volumes exceed 150,000 on two opposing approaches.	
Volume to Capacity Ratio > 0.8 on two opposing approaches.	

233.5.6.4 DLT Advantages and Disadvantages

Advantages

- May accommodate high intersection volumes and is a viable alternative to grade separation.
- Increases capacity and operational efficiency.
- Well suited to accommodate high left-turn volumes.
- Intersection delays are typically reduced by 50%-85% for a full DLT (30%-40% for partial).
- Throughput is typically increased by 10%-25% for a full DLT (10%-20% for partial).

Disadvantages

- Unique access management techniques may need to be utilized to provide access to adjacent parcels, such as frontage roads.
- U-turn movements are impractical at intersection.
- Footprint of intersection is large relative to other at-grade alternatives.
- Challenges regarding navigation and adherence to traffic control devices may arise where right turn bypass lanes are omitted.

233.5.6.5 DLT Pedestrian and Other Nonmotorized User Considerations

DLTs have more complex movements than standard intersections, as traffic may approach pedestrians from unexpected directions. Shorter traffic signal cycle lengths at the primary intersection may provide more frequent pedestrian crossing opportunities. Additionally, while the wider intersection footprint lengthens pedestrian crossing distances, medians may provide refuge for multistage pedestrian crossings.

The non-traditional layout of a DLT allows for various bicycle treatments, some of which may depend on the intended riding location of cyclists.

DLTs may pose potential navigational difficulties for pedestrian users with visual impairments.

233.5.6.6 DLT Costs and Maintenance

DLTs are typically 30% more expensive than traditional intersections, according to estimates from the FHWA. There are an increased number of traffic signals and associated equipment than at a traditional intersection. DLTs typically also have larger right-of-way needs than traditional intersections due to additional lanes for the displaced left-turn movements. However, construction of a DLT is significantly cheaper than grade separated alternatives which may provide equivalent capacity.

233.5.6.7 DLT Conflict Points

Conflict points for both partial and full configurations of a DLT intersection may be viewed in the table below and in the DLT Conflict Point Diagrams.

Conflict Point Type	Conflict Points DLT (Traditional Intersection)
Vehicle-Vehicle - Total	Partial – 30; Full – 28 (32)
Vehicle-Vehicle - Crossing	Partial – 14; Full – 12 (16)
Vehicle-Vehicle - Merging	Partial – 8; Full – 8 (8)
Vehicle-Vehicle - Diverging	Partial – 8; Full – 8 (8)
Nonmotorized-Vehicle	Partial – 22; Full – 20 (24)

233.5.6.8 DLT Additional Resources

FHWA Crossover Intersections

FHWA Alternative Intersections/Interchanges: Informational Report (AIIR) Chapter 8

Displaced-Left Turn (DLT) Quick Reference Table

Other Names	Continuous Flow Intersection (CFI); Partial Displaced Left-Turn (PDLT); Crossover Displaced Left-Turn (XDLT)	
Distinguishing Features and Key Considerations	• Left-turns cross over to the left side of the roadway at secondary intersections upstream of main junction. • Left-turns and through movements occur simultaneously at the main intersection without conflict. • Main junction and secondary crossovers are signalized.	
Applicability	• Where there are heavy through and left-turning volumes. • Where left-turn queues exceed existing storages. • Where there is high left-turn crash frequency. • At an urban or suburban intersection location.	
Operational Based Criteria	Full DLT Maximum Intersection Volume	12,000 vph
	Partial DLT Maximum Intersection Volume	10,000 vph
	Major street volume > 2,000 veh/hr/ln and minor street volume > 300 veh/hr/ln.	
	Mainline left-turning volumes > 250 veh/hr/ln and opposing through volumes > 500 veh/hr/ln on two opposing approaches.	
	Cross product of hourly left-turns and opposing through volumes exceed 150,000 on two opposing approaches.	
	Volume to Capacity Ratio > 0.8 on two opposing approaches.	
Advantages	• May accommodate high intersection volumes and is a viable alternative to grade separation. • Increases capacity and operational efficiency. • Well suited to accommodate high left-turn volumes. • Intersection delays are typically reduced by 50%-85% for a full DLT (30%-40% for partial). • Throughput is typically increased by 10%-25% for a full DLT (10%-20% for partial).	
Disadvantages	• Unique access management techniques may need to be utilized to provide access to adjacent parcels, such as frontage roads. • U-turn movements are prohibited at intersection. • Footprint of intersection is large relative to other at-grade alternatives. • Challenges regarding navigation and adherence to traffic control devices may arise where right turn bypass lanes are omitted.	
Pedestrian and Other Nonmotorized User Considerations	• Movements are more complex than at standard intersections, and traffic may approach from unexpected directions. • Wider footprint lengthens crossings, but median islands may provide refuge for multistage crossings. • Shorter signal cycle lengths lead to more frequent crossing opportunities. • Channelized right-turn lanes may be hazardous for pedestrians. • Potential navigation difficulty for pedestrian users with visual impairments. • Various bicycle treatments are possible, depending on the intended riding location of users.	
Costs and Maintenance	• Construction costs are higher than traditional intersections. (FHWA Estimate: Approximately 30%) • Significantly cheaper than grade-separated alternatives which may provide equivalent capacity. • More signals and associated equipment than traditional intersection. • Larger right-of-way needs than traditional intersection.	
Conflict Points (Compared to Traditional)	Vehicle-Vehicle - Total	Partial – 30; Full – 28 (32)
	Vehicle-Vehicle - Crossing	Partial – 14; Full – 12 (16)
	Vehicle-Vehicle - Merging	Partial – 8; Full – 8 (8)
	Vehicle-Vehicle – Diverging	Partial – 8; Full – 8 (8)
	Nonmotorized-Vehicle	Partial – 22; Full – 20 (24)

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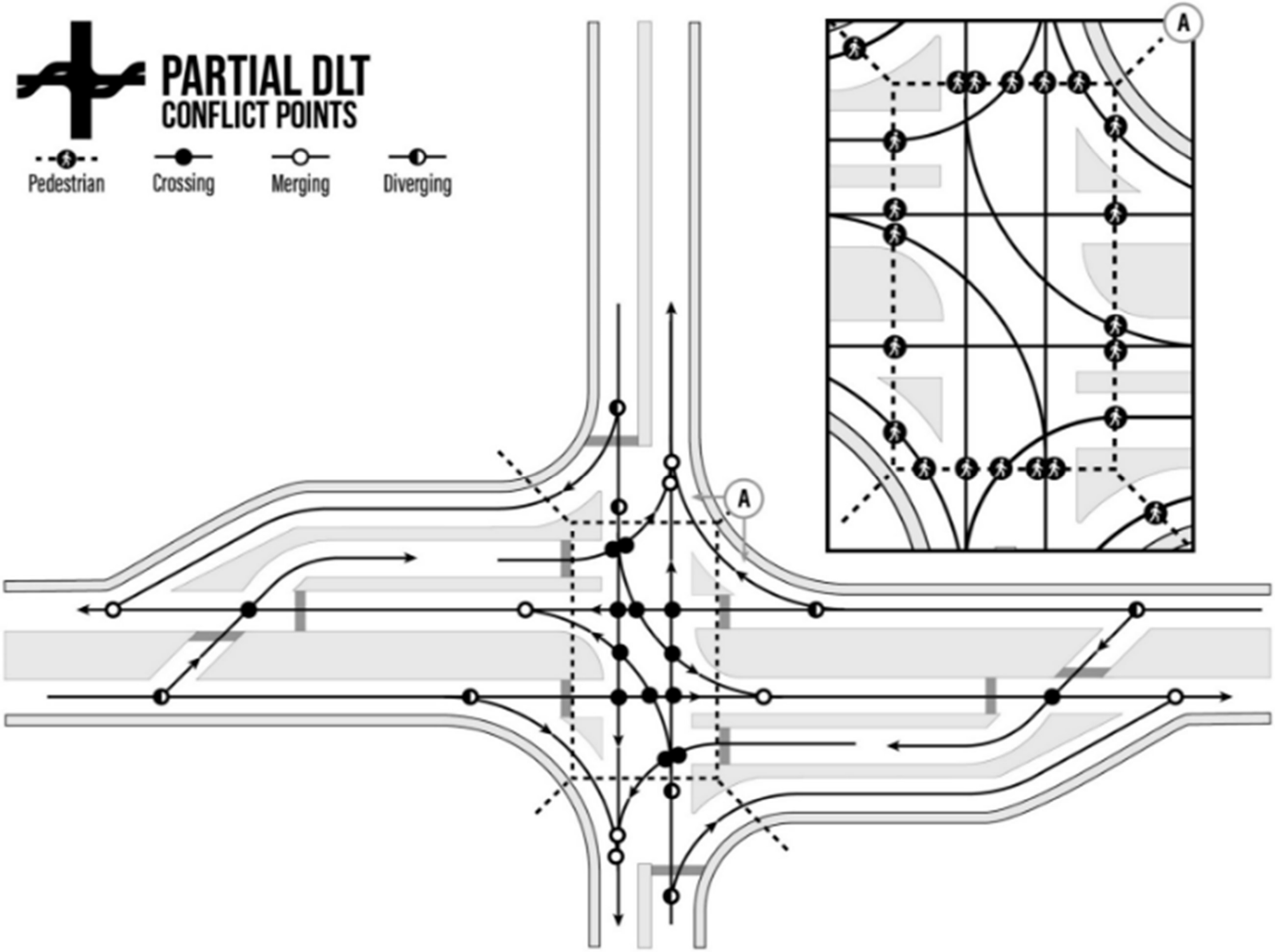

Diagram of Movement-Based Conflict Points for Partial DLT Intersections
(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

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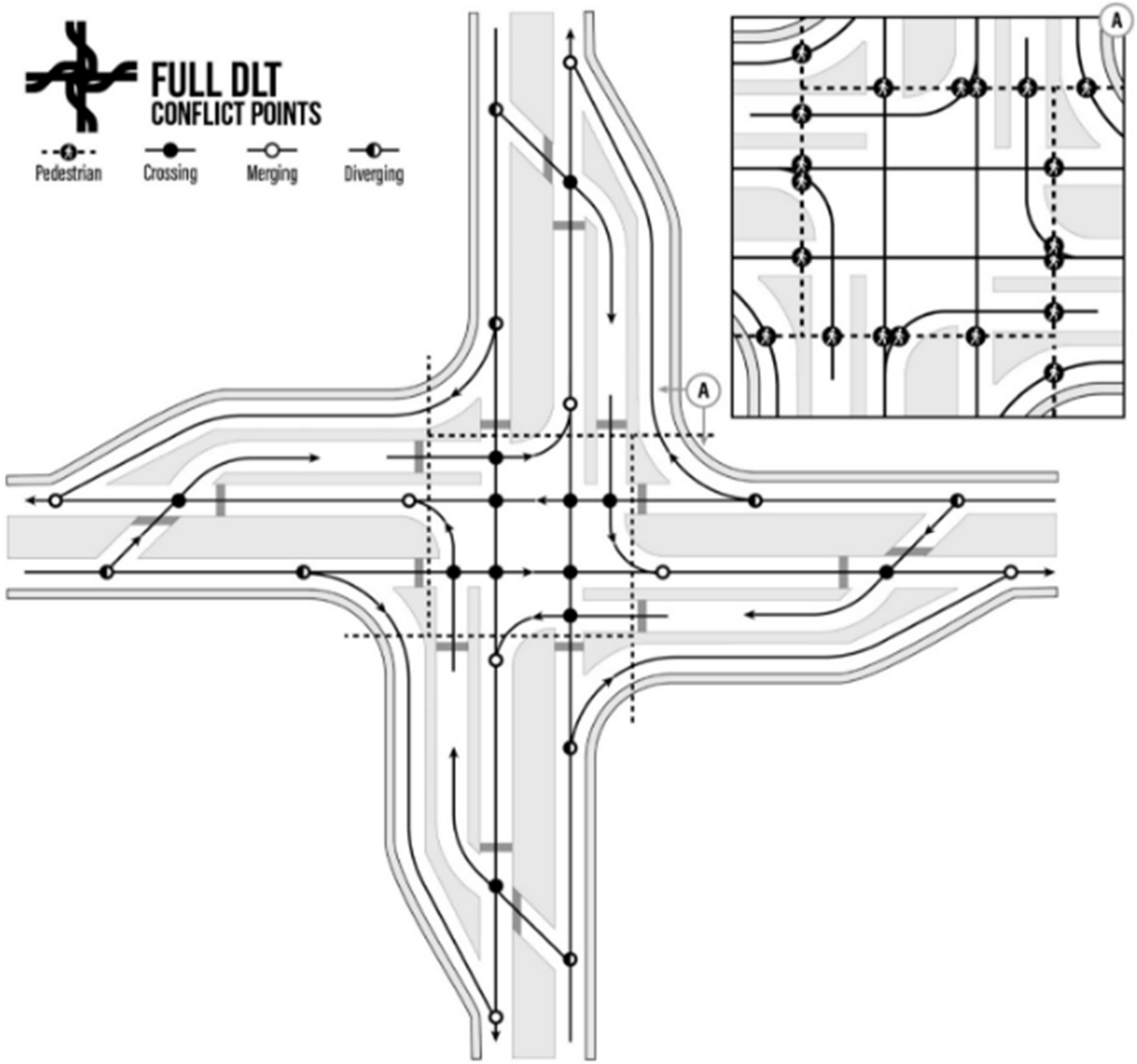

Diagram of Movement-Based Conflict Points for Full DLT Intersections

(FHWA – A Safe System-Based Framework and Analytical Methodology for Assessing Intersections)

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241.7 Roundabout Aesthetic Structure

The first step the district should take when receiving a request from an entity for a roundabout aesthetic structure is to work with the requester to determine if there are acceptable locations for the proposed aesthetic structure off Commission-owned right of way. Consideration should be given to alternative aesthetic improvements before exploring a roundabout aesthetic structure. Examples of alternate aesthetic improvements include decorative concrete, pavers/zero maintenance landscaping and low-lying landscaping.

If there are no appropriate locations off commission-owned right of way, the district will work with the requesting entity and Central Office Highway Safety and Traffic Division to review the request along with the Aesthetics Review Team.

Roundabout Aesthetic Structure Requirement

At a minimum, the request must include:

- Detailed design plans (exhibits, graphics, irrigation, location map, etc.) and specifications of the aesthetic structure, including grading around the aesthetic structure.
- A location map which should include nearby highway(s), intersection(s), town, etc.
- An aerial map of the proposed aesthetic structure location.
- A statement that alternative aesthetic improvements to a roundabout structure (e.g., decorative concrete or pavers, or zero maintenance or low-lying landscaping) have been considered and rejected.
- An explanation as to why those alternatives were rejected.
- A statement that there are no acceptable locations for the proposed aesthetic off Commission-owned right-of-way.
- Exhibit which shows the legal description from a professional land survey of the property requested for the aesthetic structure location.
- Signed and sealed plan sheets for the structure's design.
- Roadway plan sheets
- Documentation from the district which addresses **all** the above requirements.

An aesthetic structure cannot be mounted in an overhead configuration, on sign structures, or on bridge structures, (i.e. girders, columns abutment walls, aesthetics, etc.).

An aesthetic structure shall only be allowed in inner-most center island, which is defined by the area that is half the diameter of the center island, not including truck apron.

An aesthetic structure height is limited to distance to the truck apron, to assure no part of the aesthetic structure will reach the roadway should it fall over.

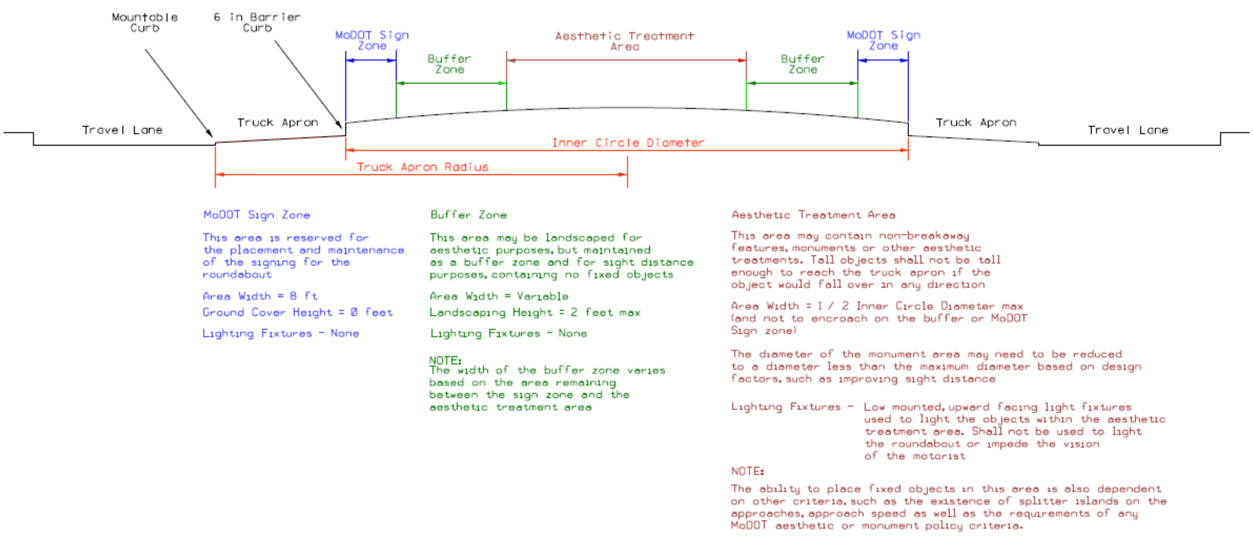
The aesthetic structure may not contain advertising or sponsorship.

To determine if a roundabout aesthetic structure could be allowed at a roundabout the following needs to be considered:

- Maximum posted speed limit of 40 mph on any of the approach roadways to the roundabout.
- For all approaches the grade must be less than +/- 3%.
- Raised splitter islands are required on all approaches to the roundabout.
- The center island (after/beyond truck apron) is required to have a barrier curb.
- The aesthetic structure shall be installed in a location that does not interfere with normal highway signs or impede sight distance.

- An aesthetic structure shall only be allowed in inner-most center island, which is defined by the area that is half the diameter of the center island, not including truck apron. The center island perimeter buffer zone or MoDOT sign zone this area is reserved for:
  - Meeting sight distance requirements
  - Installation of MoDOT traffic control signing
  - Includes a space to perform maintenance activities and for a maintenance vehicle to pull onto the center island
- Contact MoDOT motor carriers to confirm route is not in conflict with Oversize overweight (OSOW) routing.
- The district should work with the requesting entity to find a location that poses the least risk to the public.
- The city will be required to provide detailed design plans (exhibits, graphics, irrigation, location map, etc.) and specifications of the aesthetic structure, including grading around the aesthetic structure.
- The aesthetic structure must not create a distraction or a hazard to motorists or be designed in a way that might invite pedestrian traffic. Therefore, plans which include features such as water and electricity must be thoroughly examined.
- Breakaway aesthetic structure signing is preferred.
- In addition, the District Traffic Engineer must approve the installation after considering other factors, including call reports, knockdowns, and crash history.

The figure below illustrates the permitted area in which an aesthetic structure may be installed at a roundabout island.



Review and Recommendation

The district will present the request information and documentation to the district's Asset Management Committee (AMC) for conceptual approval as referenced in EPG 236.5.25 Leases, Licenses and Airspace License Agreements:

The district's Asset Management Committee will then complete their review and conceptual approval.

The district will present the provided documents to Central Office Highway Safety & Traffic who will work with the Aesthetics Review Team to provide their conceptual approval

Once the AMC and Highway Safety & Traffic provides conceptual approval, the district will send the items presented, including the AMC meeting minutes to Central Office Right of Way for conceptual approval and compliance with EPG 236.5.25.

Once Central Office Right of Way provides conceptual approval, if the aesthetic structure location is within an interchange termini they will request conceptual approval from FHWA. Once FHWA provides conceptual approval, Central Office Right of Way will inform the district that execution of the RW 45 – License Agreement for City Monument can begin.

941.5 Request by a City to Construct a “Welcome To” Monument

Cities may request to place "Welcome To" Monuments on Commission-owned land to welcome visitors to their community when their city limits encompass the state route. Welcome To Monuments are ground mounted structures only. Welcome To Monuments shall not be mounted in an overhead configuration, on sign structures or on bridge structures, i.e. girders, columns abutment walls, aesthetics, etc.

A monument is any sign that does not meet the standards and guidance described in EPG 903.9.13 Welcome To Signs. Other terms that may be used in place of monument are gateway or marker.

The first step the district shall take when receiving a request from a city for a Welcome To Monument is to work with the city to determine if there are acceptable locations for the proposed monument off of Commission-owned land.

Additional Information

EPG 903.9.13 Welcome To Signs

EPG 241 Aesthetics Considerations to Bridges

EPG 140.3 Guidelines for Installation of Banners on Lighting Poles

If there are no appropriate locations, the district will work with the city and Central Office Highway Safety and Traffic Division to compile the following information to determine if the monument request on Commission property may be considered, such as a roundabout aesthetic structure. (Link to new EPG 241.7 section.)

Monument Requirements

- The monument shall be placed in a location that is not reachable by an errant vehicle; clear zone principles do not apply.
- The monument shall be installed in a location that does not interfere with normal highway signs or impede sight distance.
- The district shall work with the city to find a location that poses the least risk to the public.
- The city shall provide detailed design plans (exhibits, graphics, lighting, irrigation, location map, etc.) and specifications of the monument, including grading around the monument.
- The monument shall not create a distraction or a hazard to motorists and the monument is not designed in a way to invite pedestrian traffic. Therefore, plans which include features such as water and electricity shall be thoroughly examined.
- One monument per each direction of travel per the dominant travelway entering into the city limits within the city limits when possible. Pending MoDOT approval.
- The district shall determine if the proposed monument location is on excess property and whether Commission ownership shall continue.
- The district shall verify there are no conflicting encumbrances on the property (lease, etc.).
- Maintenance access shall be via adjacent private property, unless physically impossible.

- The monument shall not contain advertising or sponsorship.

Once Central Office Highway Safety and Traffic conceptually approves the location of the city monument, the city will provide the legal description from a professional survey of the location to the district Traffic staff. Once the district Traffic staff receives the legal description, district Traffic staff will provide it to the district Right of Way staff. District Right of Way staff will then request categorical exclusion (CE) determination from the Environmental Studies Section for review to ensure there are no environmental issues with the proposed location.

District Review and Recommendation

The district will present the following information to the district's Asset Management Committee (AMC) for conceptual approval as referenced in EPG 236.5.25 Leases, Licenses and Airspace License Agreements:

- Location map which should include nearby highway(s), intersection(s), town, etc.
- Aerial map of the proposed monument location
- Exhibit which shows the legal description from a professional land survey of the property requested for the monument location
- Plan sheets for the monument design
- Roadway plan sheets
- Documentation from the district which addresses **all** of the above requirements.

Once the AMC provides conceptual approval, the district will send the items presented to the AMC, including the AMC meeting minutes to Central Office Right of Way for conceptual approval and compliance with EPG 236.5.25. Once Central Office Right of Way provides conceptual approval, they will request conceptual approval from Central Office Highway Safety and Traffic. Once Central Office Highway Safety and Traffic provides conceptual approval, and if the monument location is on interstate right of way, Central Office Right of Way will request conceptual approval from FHWA. Once FHWA provides conceptual approval, Central Office Right of Way will inform the district that the final approval and execution of RW45 agreement stage can begin.

Final Approval and Execution of Agreement

The district will inform the city that conceptual approval has been granted and the requirement to enter into a license agreement with the Commission. The district will draft the license agreement (RW45 Agreement) in eAgreements and request a locally executed agreement from the city.

The district will provide Central Office Right of Way the locally executed agreement and the CE approval. Once Central Office Right of Way approves the locally executed agreement, they will request approval from Central Office Highway Safety and Traffic. Once Central Office Highway Safety and Traffic approves, and if the monument location is on interstate right of way, Central Office Right of Way will request approval from FHWA. Once FHWA approves the agreement, Central Office Right of Way will fully execute the agreement and provide a copy to the district. District Right of Way will enter the agreement into the Realty Asset Inventory.