

City of Westerville, Ohio



Access Management Guidelines

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1) PURPOSE

Access Management is the practice of controlling the number, type, size, and location of access points to the roadway system in order to promote the efficient and safe movement of traffic. The Federal Highway Administration (FHWA) cites access management as a proven safety countermeasure. The following subsections describe the scope of access control at the state, county, and local municipal levels.

a) **Scope of ODOT Access Control Authority**

The Ohio Department of Transportation (ODOT) has developed the State Highway Access Management Manual, which establishes procedures and standards to protect the utility, function, capacity, and safety of the state highway system. ODOT is responsible for the control of access on the following roads:

- I. All interstate facilities;
- II. All State and U.S. Routes where the Right-of-way (R/W) was purchased as Limited Access (LA/RW) including along an interchange cross street;
- III. State and U.S. Routes outside of incorporated areas

b) **Scope of County Access Control Authority**

Similarly, Franklin and Delaware Counties have developed their own respective regulations and standards for access management along county facilities. For facilities located in unincorporated areas not designated as State or U.S. facilities, refer to the appropriate county regulations to determine access requirements.

c) **Scope of City of Westerville Access Control Authority**

The standards and guidelines included in this document have been developed to establish uniformity for encroachments upon roads within the City of Westerville roadway network system to provide for the safe and efficient movement of traffic while allowing reasonable access to abutting property. The intent is to provide a majority of the information needed for encroachments onto the roadway network system.

Access control along facilities within the City of Westerville should be coordinated with the City Engineer to ensure that access management standards are in accordance with Westerville Codified Ordinance 1201.07(e).

2) DRIVEWAY SPACING

The appropriate spacing of driveways can reduce the potential for conflict and minimize collisions along a facility. The following standards apply to driveways located within the City of Westerville:

- Driveway spacing shall be measured from near edge to near edge of adjacent driveways as shown in Figure 2.1.
- Table 2.1 represents the minimum spacing that should be provided for a given speed limit and daily traffic volume, or Annual Average Daily Traffic (AADT). Driveways generating more than 50 peak hour trips based on the most recent version of the ITE Trip Generation Manual or local



count data shall use the larger of the two spacing requirements regardless of the adjacent roadway AADT.

- In general, it is desirable to provide the maximum spacing possible while providing adequate sight distance.

Figure 2.1: Measuring Driveway Spacing

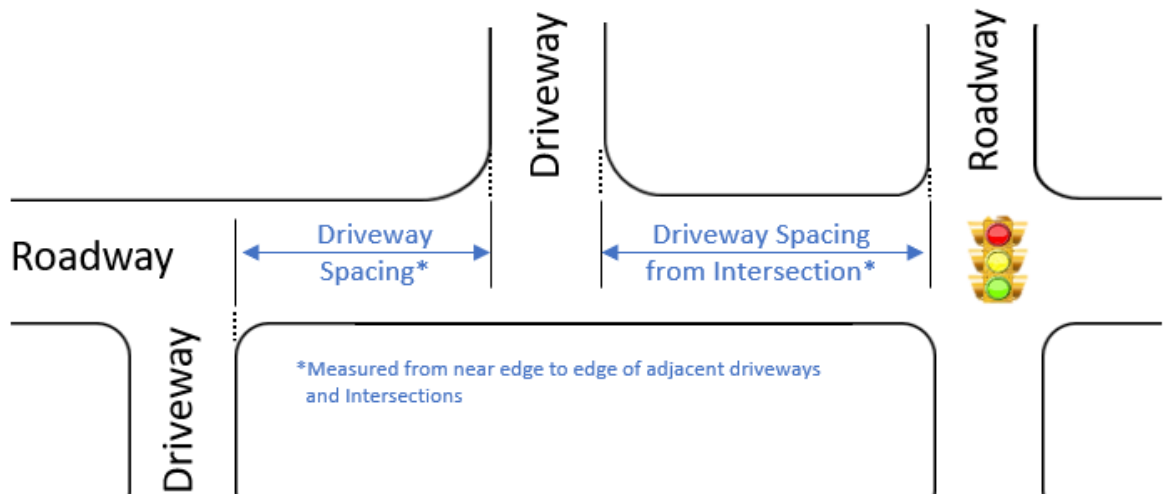


Table 2.1: Minimum Driveway Spacing

Posted Speed Limit (mph)	Minimum Driveway Spacing (ft) on roadways with AADT \geq 2000 or Driveways Generating more than 50 Peak Hour Trips	Driveway Spacing (ft) on Roadways with AADT < 2000	
		Recommended	Minimum
25	155	75	50
30	200	100	50
35	250	150	50
45	360	225	50

Exceptions to minimum driveway spacing include the following:

- The placement of residential (low volume) driveways. These drives should be placed in a reasonable location on the property they serve to avoid interference with adjacent drives as determined by the City Engineer.
- The replacement of a driveway to a property that may be lost or disrupted due to a City of Westerville project.



In the case of large developments with outparcels, access for outparcels should be provided only internally. However, shared or individual driveways may be permitted provided that twice the normal spacing requirements are met and has City Engineer approval. When direct access is approved, it should be limited to right-in, right out. Even when single or shared outparcel driveways are allowed, additional access from the outparcels to the major development should be provided. Notation of access for outparcels shall be made on the plans for the development. Early coordination with the City Engineer is encouraged as part of a master development plan.

Existing Driveway Considerations

The property owner or permittee, if applicable, may be required to reconstruct, relocate, redesign, remove, or otherwise modify an existing access in order to conform to the standards and design specifications of the City of Westerville when a change in use of the property is approved. Previously approved accesses for properties that have been vacant for 2 years or more may not be grandfathered as an approved access point. Considerations for existing driveways should be coordinated with the City Engineer.

Driveway Overlap

Closely spaced driveways on opposite sides of an undivided roadway or roadway with a two-way left turn lane (TWLTL) should be avoided wherever practical. These could introduce undesirable traffic movements and turning conflicts. The spacing of these drives should also follow the requirements set forth in Table 2.1.

Figure 2.2: Examples of Driveway Overlap

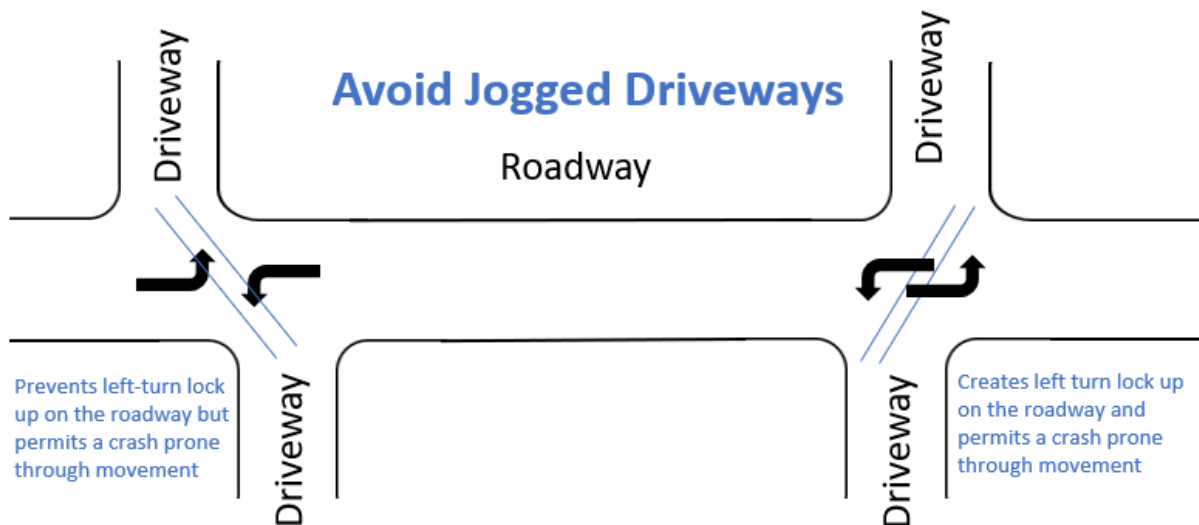
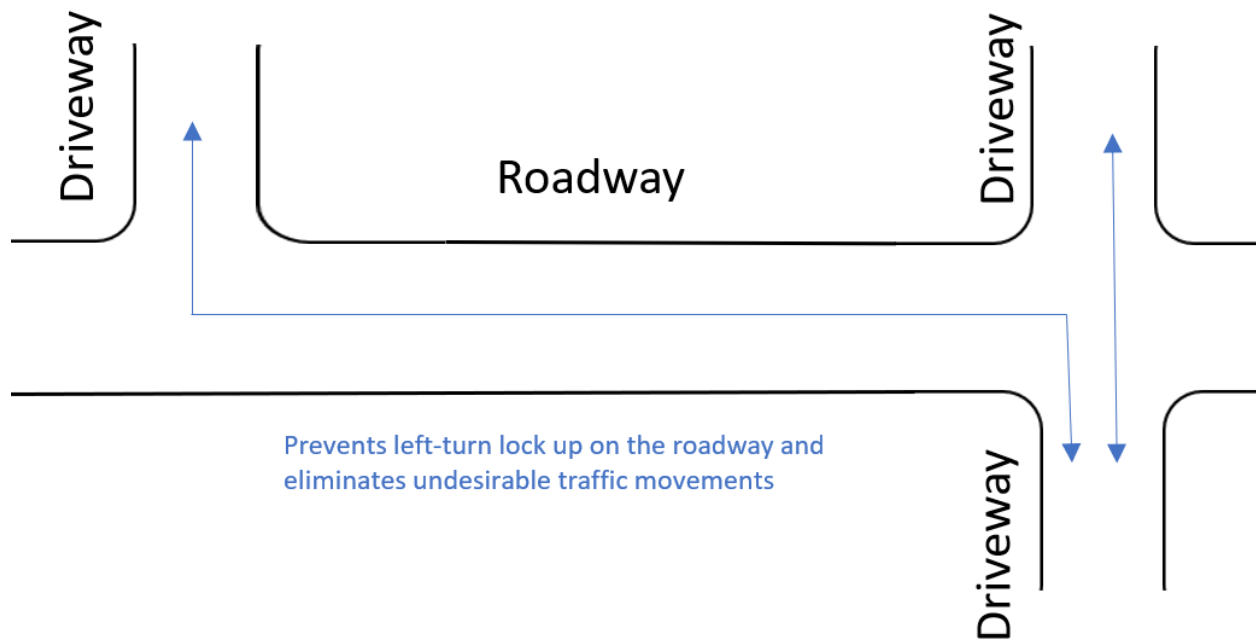




Figure 2.3: Preferred Driveway Example to Avoid Overlap



Driveway Proximity to an Intersection

Driveway radius and corner clearance should be considered for driveways located close to intersections as these can cause operational and/or safety problems. The purpose of corner clearance is to remove conflicting movements from the functional area of intersections and provide sufficient stacking space for queued vehicles at intersections so that the driveways are not blocked. These requirements may limit or exclude driveways on some corner lot frontages. In most cases driveways near intersections should not be allowed full movements in/out if those movements are required to cross left turn lanes serving the intersection on the adjacent primary street. Driveways should not be permitted within the boundaries of a turn lane, but if there is no other option, consideration could be given to limiting the drive to right-in/right-out only. It may also be desirable to locate a drive as far as possible from the intersection; even though this may result in the proposed drive being located too close to the drive on the adjacent property and would be considered at the discretion of the City Engineer.

3) DRIVEWAY DESIGN ELEMENTS

Driveway Medians

Per ODOT, a median is the portion of the highway separating opposing directions of the traveled way. Medians are highly desirable elements on all streets or roads with four or more lanes.



- When a median is used to separate opposing traffic on a driveway, the part of the median within the right-of-way shall have a minimum width of 4 feet and a maximum width of 12 feet.
- The median nose shall be offset a sufficient distance so that the median does not encroach into the normal shoulder width of the roadway.
- Landscape plants on the median and within 15' feet from the edge of traveled through way shall be limited to low growing plants not exceeding 2½ feet in height. These plants shall not negatively affect sight distance.
- When the median width is larger than 4 feet, the nose shall be defined with a 2-foot radius and the control turning radius (the largest turning radii of all movements adjacent to the median).

Right-in, Right-out Driveways (RIRO)

Right-in, right-out driveways are necessary in some locations to remove left turn and through movement conflicts.

- A RIRO driveway should incorporate a triangular (pork chop) raised concrete island no smaller than 100 square feet with sides a minimum of 12 feet in length after rounding of the corners.
- When a RIRO driveway is implemented on an undivided roadway, the use of a restrictive median in concurrence with the “pork chop” island is preferred; however, adjacent impacts must be evaluated prior to implementing restrictive medians. A 4-foot-wide raised concrete median is recommended.

Materials

All curb cuts/private drives off the public streets shall have a concrete approach and or brick pavers, concrete band to distinguish between public and private improvements.

4) DRIVEWAY THROAT LENGTH

Per ODOT, care should be taken to ensure proposed driveways, especially to large traffic generators such as malls and shopping centers, provide sufficient driveway throat length to ensure that vehicles entering a parking facility do not backup (queue) into the public street system. Generally, entering movements should free-flow into the parking area and do not need to yield or stop for vehicles exiting or traversing through the parking area.

City of Westerville has the authority and responsibility to require a sufficient throat length (beyond the right-of-way limits) to protect the needs of the adjacent roadway system.

- Driveways shall be designed to provide adequate queue storage and sufficient maneuvering distance. The larger the volume using the driveway, the more the driveway should be designed like a major roadway intersection.
- For unsignalized driveways, Figure 4.1 and Table 4.1 should be used as an estimate of the needed driveway throat length.
- For signalized driveways, the driveway throat length can be estimated using Table 4.1 but should be verified through a traffic engineering study.
- If a development has a gated entrance or a check in station, the throat length should contain the anticipated peak hour queue.



Figure 4.1: Recommended Driveway Throat Lengths

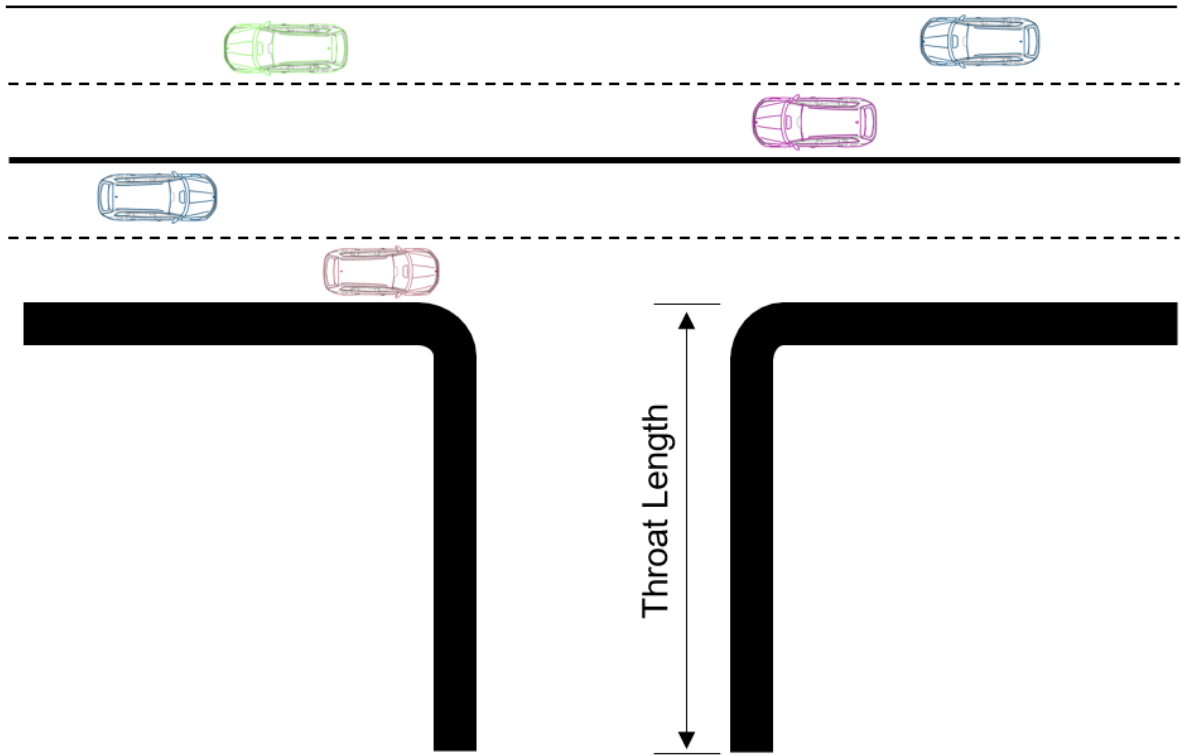


Table 4.1: Recommended Driveway Throat Lengths

Signalized Access	Throat Length
4 exiting lanes	≥350 ft, based on traffic engineering study
3 exiting lanes	250 ft.
2 exiting lanes	150 ft.

Unsignalized Access	Throat Length
1 entry lane, 2 exit lanes	50 ft.*
1 entry lane, 1 exit lane	50 ft.

5) INTERSECTION SPACING

Unsignalized Intersection Spacing

Short distances between intersections should be avoided if possible as they tend to impede traffic operations. Short spacing between intersections may hinder or even restrict effective left-turn movements. Roadways should be realigned to form a single intersection whenever possible. To operate efficiently, intersections should be a minimum of 500 feet apart.

Signalized Intersection Spacing

If two intersections are close together and require signalization, they may need to be considered as one intersection for signalization purposes. To operate safely, each leg of the intersection may require a separate green phase, thereby greatly reducing the capacity for both intersections. Closely spaced traffic signals result in frequent vehicle stops and starts, unnecessary delay, and increased fuel consumption and emissions. Long and uniform signal spacing allow signal timing plans to efficiently accommodate varying traffic conditions including congested peak hours. Figure 5.1 and Table 5.1 show the spacing requirements for signalized intersections. Less than minimum traffic signal spacing is only permitted if there is no reasonable alternative, and a weave and queue analysis show adequate spacing and is at the discretion of the City Engineer.

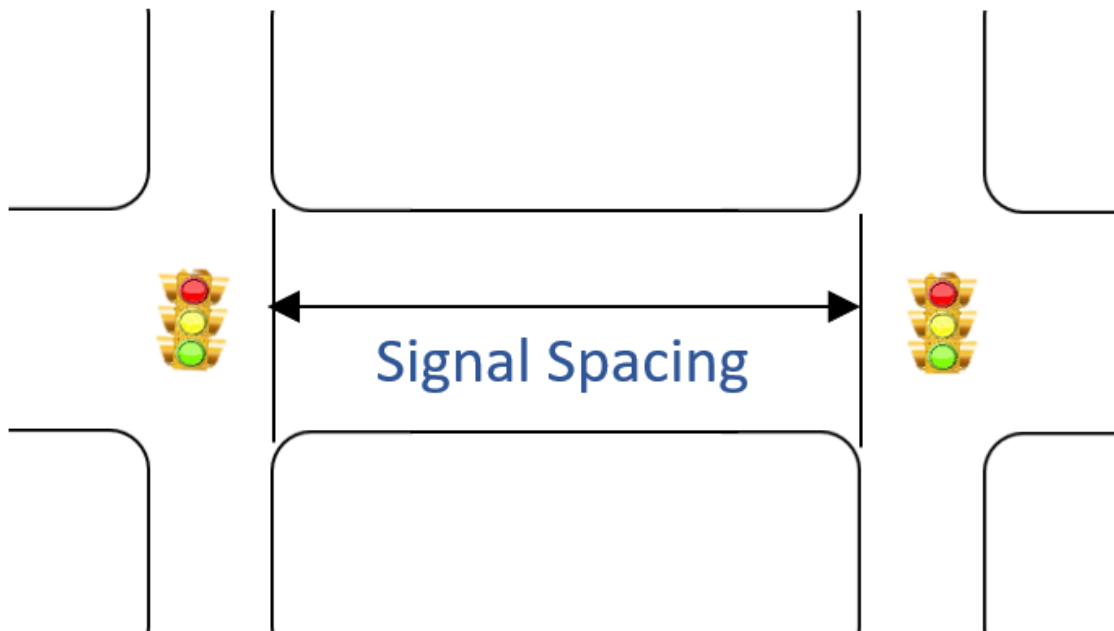


Figure 5.1: Signalized Intersection Spacing



Table 5.1: Signalized Intersection Spacing

Typology (Functional Class)	Recommended Traffic Signal Spacing (ft)
Parkway (Major Arterial)	2,640
Boulevard (Minor Arterial)	1,320
Avenue (Collector)	1,320
Street (Local)	1,320

6) SIGHT DISTANCE

Driveway spacing may be varied to provide, improve, or maximize sight distance. The recommended sight distance is Intersection Sight Distance (ISD) with the minimum being mainline Stopping Sight Distance (SSD). To enhance traffic operations, intersection sight distance should be provided at all intersections. If intersection sight distance cannot be provided due to environmental or right-of-way constraints, then as a minimum, the stopping sight distance for vehicles on the major road should be provided. By providing only stopping sight distance, this will require the major-road vehicle to stop or slow down to accommodate the maneuver of the minor-road vehicle. If the intersection sight distance cannot be attained, additional safety measures should be provided. These may include, but are not limited to, advance warning signs and flashers and/or reduced speed limit zones in the vicinity of the intersection. Refer to Chapter 9 of the American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets 2011 for Sight Distance guidance.

Table 6.1: Suggested Intersection Sight Distances for Passenger Cars Entering Two Lane Roadways from Stop with Various Speed Limits

Operating Speed on Roadway (Mph)	Safe Sight Distance Looking Left from Driveway (ft)	Safe Sight Distance Looking Right from Driveway (ft)
25	280	240
30	335	290
35	390	335
45	500	430

Source: American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets 2011 (AASHTO: Washington, DC, 2011)

7) TURN LANE WARRANTS

At unsignalized access points, turn lane warrant analyses must be performed to determine if right or left turn lanes are warranted. Sometimes turn lanes are not required for low volume and minimal use drives. Turn lanes for these drives, however, may be required for considerations such as:

- Providing acceptable levels of service as determined by a Traffic Analysis or TIS; or



- Mitigating existing or expected crash concerns; or
- Matching adjacent or nearby typical sections of the adjacent street; or
- Preparation for future widening plans of the adjacent street

Access requests that require a Traffic Analysis or TIS shall include a turn lane analysis.

a) **Stop Controlled Intersection**

Where signal warrants are not anticipated to be met by the design year or would not be installed due to access management controls, Figures A-1 thru A-8 of the ODOT Location & Design Manual Volume I (link provided below) should be used to determine the need for turn lanes.

ODOT Location & Design Manual Volume I:

(<http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/roadway/Pages/locationanddesignmanuals.aspx>)

The stopped approaches may be evaluated using the latest edition of the Highway Capacity Manual to determine the necessary number and type of lanes to improve the Levels of Service.

b) **Left Turn Storage Lanes**

The accommodation of left turns is often the critical factor in proper intersection design. Left-turn lanes can significantly improve both the level of service and intersection safety. Always use an exclusive left-turn lane at intersections with public roads on divided urban highways with a median wide enough to accommodate a left-turn lane, regardless of traffic volumes. Consider using an exclusive left-turn lane for the following:

- At any signalized intersection
- At signalized intersections where you have 300 vehicles per hour, consider a traffic study to determine if dual left-turn lanes are required;
- At all entrances to major residential, commercial and industrial developments;
- At all median crossovers;
- Where a left-turning vehicle crosses 3 or more lanes
- For uniformity of intersection design along the highway if other intersections have left-turn lanes (i.e., to satisfy driver expectations); or
- At any intersection where crash experience, traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to left-turning vehicles.
- To determine the need for left turn lanes, intersection capacity analysis procedures of the current edition of the Highway Capacity Manual should be used.
- For unsignalized intersections, left turn lanes may also be needed if they meet warrants as provided in the ODOT L&D Manual Volume I.
- After determining the length of a left turn lane, the designer should also check the length of storage available in the adjacent through lane(s) to assure that access to the turn lane is not blocked by a backup in the through lane(s). To do this, the turn lane figures included in the



ODOT L&D Manual Volume I may be utilized using the average number of through vehicles per cycle, and the required length determined directly from the table.

- If two or more lanes are provided for the through movement, the length obtained should be divided by the number of through lanes to determine the required storage length. It is recommended that left turn lane storage be at least 100 ft. long, and the maximum storage length be no more than 600 ft.
- The width of a left turn lane should desirably be the same as the normal lane widths for the facility. A minimum width of 11 ft. should be used in moderate and high-speed areas, while 10 ft. may be provided in low speed areas. Additional width should be provided whenever the lane is adjacent to a curbed median.

c) **Right Turn Storage Lanes**

The use of right-turn lanes at intersections can significantly improve operations. Consider exclusive right-turn lanes for the following:

- On the through road of any unsignalized intersection on a two-lane urban highway;
- On the through road of any unsignalized intersection on a high-speed, four lane urban highway;
- At any intersection where a capacity analysis determines a right-turn lane is necessary to meet the level-of-service criteria;
- As a general rule, at any signalized intersection where the projected right turning volume is greater than 300 vehicles per hour and where there is greater than 300 vehicles per hour per lane on the mainline;
- For uniformity of intersection design along the highway if other intersections have right-turn lanes;
- At any intersection where the crash experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to right-turning vehicles.

To determine the need for right turn lanes, intersection capacity analysis procedures of the current edition of the Highway Capacity Manual should be used.

- For unsignalized intersections, right turn lanes may also be needed if they meet warrants as provided in the ODOT L&D Manual Volume I. The warrants apply only to the free-flow approach of the unsignalized intersection.
- Figures in the ODOT L&D Manual Volume I may be used in preliminary design to estimate the storage required at signalized intersections.
- The recommended maximum length of right turn lanes at signalized intersections is 800 ft., with 100 ft. being the minimum length.
- The blockage of the right turn lane by the through vehicles should also be checked using Figure A-8.
- The width of right turn lanes should desirably be equal to the normal through lane width for the facility. In low speed areas, a minimum width of 10 ft. may be provided. Additional lane width should be provided when the right turn lane is adjacent to a curb.