



LAND USE & TRANSPORTATION MEMORANDUM

Engineering, Traffic and Survey

To: Holders of the Road Standards
From: Stacy Shetler, P.E., County Engineer
Date: September 22, 2021
Subject: Channelized Right Turn Lanes on County Roadways

Background: Washington County designs and builds transportation infrastructure that balances safety and mobility in ways that are both efficient and durable. Intersections are key locations for the function and safety of the entire transportation network. Specific safety and mobility-based assessments and design go into the development of an intersection design plan. These plans consider the different travelers and modes using intersections including people walking, biking and using transit, freight haulers, emergency service vehicles and passenger vehicles. Often there are many qualitative and quantitative considerations that contribute to the final plan.

One element of an intersection that impacts safety and mobility for both vehicles and pedestrians is the use of channelized right turn lanes. A channelized right turn lane is a dedicated lane for vehicles turning right at an intersection that is separated from the rest of the intersection by striped lines or raised barriers that typically takes the shape of a triangular island. There are several attributes that affect the safety and operations of a channelized right turn lane including:

1. Vehicle turning speed (directly attributable to geometry including the radius, angle, and spacing of the turn)
2. Sight distance for vehicles and pedestrians (directly attributable to geometry including the radius, angle, and spacing of the turn)
3. The presence of dedicated deceleration and/or acceleration lanes
4. Traffic control including signing, striping, and signalization

Guidance and Design Parameters for incorporating channelized right turn lanes at Washington County intersections.

The County has developed this guidance for helping determine when it is appropriate to use channelized right turn lanes and what design treatments should be evaluated and incorporated. The guidance is based on best practice information from Federal Highway Administration PedSafe/BikeSafe, National Cooperative Highway Research Program (NCHRP), Federal Highway Administration Proven Safety Countermeasures and other emerging, reliable sources. Consideration of the adjacent land use, context zones, city input, and public outreach should also be part of any final design.

A channelized right turn lane may be considered when one or more of the following conditions exist:

- Presence of more than one dedicated right turn lane
- Geometry of intersection dictates the need for larger than typical radii to accommodate the design vehicle
- Crosswalks will be significantly skewed relative to adjacent vehicle traffic without pedestrian islands (can affect both pedestrian visibility for right-turning vehicles and ability for vision-impaired pedestrians to navigate the crossing safely)
- The pedestrian crossing covers more than 6 contiguous vehicle lanes without a refuge
- Pedestrian comfort and safety will be improved by the provision of a pedestrian refuge
- A right side, bus queue jump lane is not viable for existing or future transit service

If a channelized right turn lane will be included in an intersection design, specific bicycle and pedestrian associated treatments should be evaluated and incorporated into the design plan when appropriate.

Treatments may include the following:

- Right turn deceleration lane (acceleration lanes are not appropriate in most cases and contexts on County facilities)
- Smaller or compound curb radius
- Mountable radius apron, i.e. 'truck aprons'
- Optimized geometry for pedestrian visibility
- Raised pedestrian crosswalk table
- Signalization or stop control at the crosswalk ('No Turn on Red' restrictions should be reserved for situations where sight distance is limited)
- High-visibility signing, striping, and markings
- Pedestrian island sizing to accommodate potential pedestrian numbers
- Pedestrian island sizing to accommodate potential bicycle left turn box
- Pedestrian island 'cut-through' instead of curb ramps
- Green bike lane conflict zone pavement markings
- Other principles of National Cooperative Highway Research Program (NCHRP) Report 834 for designs for visually impaired pedestrians

Channelized right turn lanes that egresses directly from a through lane (commonly known as a "slip" lane) should be avoided or designed with the above parameters in mind.

Once recommendations have been developed it is recommended that designers meet with traffic engineering staff to discuss. Because each location is unique, the final design will likely be the result of an evaluation of trade-offs and engineering judgement.

Figure 1

Oregon Department of Transportation

H6: Channelized Right Turn Lane with Raised Median

Description: A right turn lane separated from the through and left turn lanes on the approach by a raised island and has separate traffic control from the primary intersection. The channelized right turn lane may or may not have a deceleration lane entering it and it may have a merge or an auxiliary lane at the existing end.

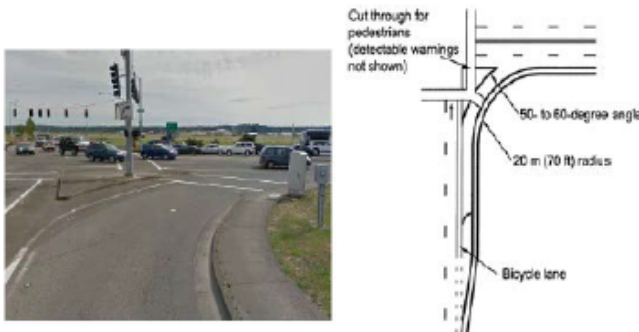


Image from Google

Applications: Where you want to minimize the number of potential turning conflicts at an intersection, where you want to shorten pedestrian crossing distances and/or where you need a larger turning radius.

Considerations: Creates a wider intersection footprint and may require additional right of way.

Special Conditions: This countermeasure CRF applies to BOTH signalized and unsignalized intersections. This countermeasure requires a concrete/raised island, it does NOT apply to painted islands.

ODOT CRF Value:

35%

Reduction in All Crashes
at All Injury Severities
(Excludes PDO's)

Range of Effectiveness:

25% - 50%

Safety Effects:

This countermeasure can provide better clarity to the minor street traffic of which vehicles are in the through lanes on the major street and minimizes the number of conflict points within an intersection. It can create a pedestrian refuge for two stage crossings and it minimizes lane encroachment.

References:

[Desktop Reference for Crash Reduction Factors \(FHWA-SA-08-011\)](#)

Oregon Department of Transportation, 2015, p. 27