

Maine Department of Transportation

Highway Program

Design Guidance

Title: Medians and Islands

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Background

MaineDOT's use of medians/islands is to promote safety along Maine's roadways. Medians are typically used to prevent traffic from turning left from a roadway into an access point, traffic turning left from an access onto the roadway or traffic from crossing a roadway. Medians are typically found on controlled access highways to separate opposing traffic, but can also be found on many of Maine's roadways. Islands are typically installed as channelization devices, to direct vehicles along a desired path. Islands can be found in the center of the road, along the edge of a road, in an access point or in the center of a round-about. In terms of this guideline, the two terms will be synonymous and to avoid confusion the Department will use the term island.

Guidance

Raised Islands – Raised islands are to be used when/where there are documented (via crash records) rear-end type crashes, as they are the most effective form of channelization or in areas to limit turning movements, such as at driveways/entrances near intersections. Most raised islands are formed using Type 5 (sloped) granite curb (bituminous options may be used but are often less durable). Some raised islands are used as access islands in driveways/entrances parallel to the roadway; these islands would be formed using Type 1 vertical curb (bituminous options may be used here also). All island curb terminal ends and circular curb ends shall be painted with white paint for delineation and overhead lighting should be considered to provide continuous lighting through the raised island area. When lighting is used, it shall meet the following light levels: lighting shall have an average of 0.6 to 1.0 foot candles, with the maximum to minimum lighting ratio of not more than 10:1 and an average to minimum light level of not more than 4:1. If lighting is not used, then vertical reflectorized delineators shall be used. *Pros* – 1. provides the ultimate in delineation of lanes; 2. Durable; 3. can add vertical

reflectorized delineators to the top of the islands instead of lighting; 4. can overlay against them; 5. provides barrier against turning traffic in areas where you want to prohibit the movement. Cons – 1. expensive; 2. obstacles in the road; 3. if using vertical reflectorized delineators, plowing can be an issue for the maintenance authority; 4. the raised island make plowing an issue; 5. drainage issues on super elevated roadways; 6. snow melt can be an issue causing run-off across the roadway

Painted – Painted islands may be used in lieu of raised islands when using a raised island would have negative impacts on vehicle ingress/egress at roadway access points. The islands shall consist of diagonal yellow bars (45 degrees to the centerline). The diagonal bars shall be installed similar to the slash symbol - / - so that in the direction of travel the diagonal goes up and to the right. The bars shall be a minimum of 24 inches wide, with a standard spacing of 50 feet between bars. At a minimum an island shall have at least 3 bars painted within it.

Alternatives

Municipalities wishing to have an alternative island type such as stamped pavement or flush concrete would have the ability to choose those options but would be required to pay a cost share as per MaineDOT's Cost Sharing Policy.

Stamped Pavement Islands – Stamped pavement is an alternative treatment for island construction. Stamped islands shall only be used when requested by a municipality. The stamping shall be at least 1/2 inch in depth and shall be painted red and shall have the appropriate color line around the island (white if the island is between two lanes of same way traffic and yellow if between lanes of opposing traffic). The island tapers shall be stamped to a minimum width of four feet, the remaining section of taper can be paint. *Pros – 1. low cost; 2. ease of installation; 3. no need for lighting or raised delineation; 4. not an issue with future overlays; 5. can be used to narrow travelway widths at spot locations without causing potential safety issues Cons – 1. paint wears off; 2. can get covered by snow limiting its value in storms; 3. traffic may still ride over the island instead of around it*

Flush Concrete - Flush concrete islands can also be used as an alternative treatment when requested by a municipality. It is now MaineDOT's policy to install the concrete islands so they are flush to the pavement, instead of 1 inch raised, due to problems with snow plowing. It is intended that the concrete be colored red and have ½ inch depth stamping on the surface. The concrete island shall be 4 inches minimum in depth with wire mesh reinforcement as a minimum and concrete shall be LP class. The island tapers shall be flush concrete to a minimum width of two feet with the remaining section of taper as paint. *Pros – 1. provides better delineation than stamped island; 2. different texture and color than pavement; 3. color doesn't wear off Cons – 1. concrete may have issues with raveling edges; 2. issues with future overlays; 3. expense.*

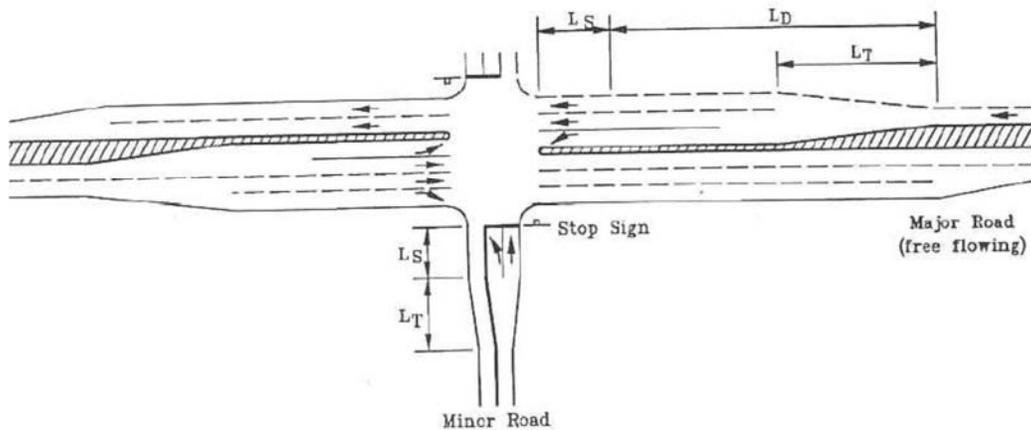
Tapers – Islands that are used to shift through traffic over to create turn lanes shall have the following taper lengths: 40 mph and under $WS^2/60$ and 45 mph and above WS , where W is the width of the shift and S is the posted speed. See Table below for Taper rates into a turn lane:

- 1) Minimum Length: The minimum length of an auxiliary turning lane will be the taper length (L_T) plus the storage length (L_S).
- 2) Use of Deceleration Length: The designer should consider providing the deceleration length (L_D), if practical at the following:
 - a) all legs of a signalized intersection (except the truncated left of a signalized T-intersection); and
 - b) The free-flowing legs of a stop controlled intersection for the left- turn lane
Deceleration length need not be considered at stop-controlled legs, nor at the truncated leg of a signalized T-intersection, nor at a right-turn lane for the free-flowing leg at a stop-controlled intersection.

Design Element	Design Speed	Traffic Control	Criteria see notes 1,6	
Taper Rate (L_T)	30	All	8 :1	
	40		10:1	
	50		15:1	
	60		15:1	
Deceleration Length (L_D) See Notes 2, 3	30	All	120'	
	40	(See Note 2)	165'	
	50		265'	
	60		370'	
Storage Length (L_S) (See Note 4)	ALL	Unsignalized (See Note 4)	Turning DHV (vph)	L*
			<60	Minimum Length
		61-120	100'	
121-180	150'			
>180	≥ 200'			
		Signalized See Notes 4,5,6	Based on 1.5 - 2.0 times the average number of cars that will store in the turning lane per cycle during the design hour	

*Check with Traffic Engineering/Planning for this Length

- 3) Measurement of Deceleration Length: As illustrated below, the deceleration length (L_D) also includes the taper length (L_T). The L_D values in the table assume that the turning vehicle is traveling at a speed of 5 mph below the average running speed before entering the taper.



- 4) **Minimum Storage Length**: For all intersections where traffic volumes are too low to govern the minimum length will be 50' ($T \leq 10\%$) or 80' ($T > 10\%$) where T is the percent of trucks turning.
- 5) **Coordination**: The Traffic Engineering Division should provide the storage length (L_S) required at signalized intersections.
- 6) **Storage Length of Through Traffic**: In addition to the table criteria, the length of turning lanes at signalized intersections should exceed the calculated storage length in the through lane adjacent to the turning lane for the design hour.

Additional Guidance

When deciding whether or not to use an island, designers and team members should set out to determine the desired effect of the island (e.g. to prevent rear end collisions, for access management, to restrict turning movements, separate traffic). Once the need has been determined, the designer should weigh the pros and cons to determine the potential impacts of the island installation (e.g..Lighting? Need for delineation? Posted Speed? Corridor Priority? Impact on access points? Safety of vehicular traffic? Does the desired effect outweigh the ramifications of the issue?). These items should be discussed with all impacted parties before rendering a decision.

Longitudinal islands are often placed in driveway/entrances along the edge of the shoulder to provide channelization of vehicles entering onto the roadway. These islands are normally raised islands. Designers should be using these types of island to delineate wide open paved/gravel area, but should not be doing this indiscriminately. Designers should be looking at the impact on parking, impact to businesses, distance from the roadway to the building, location of vehicular doors in garages, the design vehicle using the driveway/entrance and weighing whether the impact of island placement outweighs the gain in safety.

Islands are not required to be used to separate opposing traffic at intersections. The use of, type of and width of islands used at intersections will be a function of the type of traffic, whether the intersection is signalized, type of access points adjacent to the intersection, pedestrian access, existing crash patterns and available Right of Way. Traffic Engineering will help develop recommendations for the use of an island on individual projects. Islands are required any place a turn lane is developed if the development of the turn lane requires the through traffic to divert from its original lane in which case the turn lane shall be fully shadowed by the island. The type of island to be constructed is left up to engineering judgment based on the circumstances at hand.

Where crashes have been an issue for access points near an intersection, raised islands may be the proper treatment, while in other areas stamped painted islands or one of the alternatives may be the preferred treatment. The ultimate decision should be made after gathering all the information regarding the area in question including input from municipal officials, local maintenance, region traffic Engineer, Right of Way team member, surrounding landowners, the local comp plan for potential land uses and the pros and cons listed above. MaineDOT will have ultimate authority to determine which island treatment is needed based on the intersection/roadway as a whole.