Attachment A
Evaluation of Channelization for Private Approaches

Definitions

"Annual average daily traffic" (AADT) means highway traffic volumes as reported in the most recent edition of the Transportation Volume tables published annually by the department.

"Average daily trips" (ADT) means the total of all one-direction vehicle movements with either the origin or destination inside the study site that includes existing, primary, pass by and diverted linked trips and is calculated in accordance with the procedures contained in Trip Generation, 9th Edition published by the Institute of Transportation Engineers (ITE). Adjustments to the standard rates in the ITE publications for mode split may be allowed if calculated in accordance with Transportation Planning Rule and the ITE procedures. Adjustments to the standard rates for multi-use internal site trips may be allowed if calculated in accordance with ITE procedures and if the internal trips do not add vehicle movements to the approaches to the highway.

"Channelization" means the roadway lane configuration necessary to safely accommodate turning movements from the highway to an intersecting approach.

"Highway Design Manual" (HDM) refers to the 2012 Oregon Highway Design Manual.

Approaches Not Required to Meet or Obtain Deviations from Spacing Standards

Under OAR 734-051, not all approaches are required to meet access management channelization standards. Before proceeding with an evaluation of an approach, it is important to know whether it is required to meet channelization standards. The following approaches may be approved without meeting or obtaining approval of deviations from channelization standards:

- Approaches within the boundaries of a local government where the approach permit authority has been delegated to the local agency (see OAR 734-051-1050).
- Approaches within local jurisdictions that have channelization standards exceeding state standards. In this case, the local standard shall apply (see OAR 734-51-1040(2)).
- Approaches that qualify under "Change of Use" if the applicant and the department agree that an application meets "moving in the direction of" approval criteria (see OAR 734-051-3020(6)).
- Temporary approaches (see OAR 734-051-4040).
- Special use approaches (see OAR 734-051-4050).
- Approaches within the boundaries of an adopted planning document that establishes channelization standards that differ from the standards of OAR 734-051.

- Approaches to property with no means of vehicular access other than the proposed approach, if the applicant and the department agree on an approach location and mitigation measures (see OAR 734-051-4020(5)).

If the approach qualifies for Change of Use, then a collaborative process is used to determine if agreement can be reached based on the “Moving in the Direction” criteria. See OAR 734-051-3020(8)-(9). .

Temporary and Special Use approaches are approved based on a determination that they can be operated safety.

(*Note: The reviewer may use the standards described in this Technical Bulletin in an advisory capacity when examining change of use, temporary and special use approaches.)*

Channelization standards in special transportation area management plans, access management plans, corridor plans, interchange area management plans and interchange management plans adopted by the Oregon Transportation Commission take precedence over standards in OAR 734-051. These plans, as adopted, are the established channelization standards for highway segments within the scope of the document’s limits. A review of these plans is important to determine if they establish channelization standards or criteria different from those in OAR 734-051-4020.

If none of the above conditions are applicable, the review of the channelization standards should follow the guidance given below.

Determining if Channelization Standards Are Met/Not Met

The channelization standards of OAR 734-051-4020(2)(b) are thresholds that establish whether or not the standard is met. An approach **meets** the channelization standards if the average daily trips (ADTs) for the existing or proposed development:

1. Does **not** exceed 400 for an application on a two-lane highway with annual average daily traffic of 5,000 or more motor vehicles; or
2. Does **not** exceed 400 for an application on a four-lane highway with annual average daily traffic of 10,000 or more motor vehicles; or
3. When multiplied by the annual average daily traffic (AADT) on the highway, is **less than** the products listed in Table 1.

Table 1 - Channelization Standards (OAR 734-051-4020(2)(b)(C)				
Product of Property ADT Multiplied by Abutting Highway AADT (Millions)[2]				
	Speed Limit[1]			
Number of Highway Lanes[3]	25 mph or lower	30-35 mph	40-45 mph	50 mph or higher
2 lanes	5.1	3.9	1.8	1.3
4 lanes	10.2	7.8	3.6	2.6

[1]Speed limit means the posted speed. Design speeds may be considered as the speed limit for approving a deviation, particularly when the design speed is less than the posted speed.

[2]Multiply the total site ADT by the highway AADT, then divide by 1 million. Compare the resulting product to the values in the table.

[3]See section on Determining the Number of Highway Lanes below.

It is important to note that in some situations, threshold 1 or 2 may not be exceeded even though threshold 3 is exceeded. Conversely, threshold 3 may not be exceeded when threshold 1 or 2 are exceeded. Therefore, it is important to always check all three thresholds.

If none of the three thresholds above are exceeded, then the standard is met and no channelization or deviation is required. If any of the three thresholds are exceeded, then the Region Access Management Engineer or other qualified staff will need to determine if the approach application meets the channelization standard based on conformance of the existing or proposed channelization to the design requirements of the HDM in effect at the time the application is filed. See OAR 734-051-4020(2)(b).

If it is determined that a threshold is exceeded and the existing or proposed channelization does not conform to the HDM, then the standard is not met. The Region Access Management Engineer may approve or deny a request for deviation from the standard as set forth in OAR 734-051-3050(7) or (9), respectively. The Region Manager, not a designee, may approve a deviation as set forth in OAR 734-051-3050(10).

To determine if the channelization standard thresholds are exceeded, the reviewer must obtain the following information for the segment of highway where the approach is located:

- ADT for the existing or proposed development
- AADT for the highway segment that represents the approach location
- Number of highway lanes at the proposed approach location
- Speed limit (i.e., posted speed) at the proposed approach location

Example 1

An approach application is on a two-lane highway with a site ADT of 400, a highway AADT of 4,600 and a posted speed of 45 mph.

The value to use in comparison with the thresholds in Table 1 is calculated as follows: (400 x 4,600)/1,000,000 = 1.84. The calculated value exceeds the threshold in Table 1

(1.8) for two-lane highways with a speed limit of 40–45 mph. Therefore, channelization or approval of a deviation is required for approval of the application, *unless* the Region Access Management Engineer or other qualified staff determine that the existing or proposed channelization conforms to the design requirements of the HDM.

Note in this example that the first channelization threshold is not exceeded by the traffic volumes proposed and the highway AADT, but the third threshold is exceeded.

Example 2

An approach application is on a four-lane highway with a site ADT of 400, a highway AADT of 10,000 and a posted speed of 45 mph.

The value to use in comparison with the thresholds in Table 1 is calculated as follows:

(400 x 10,000)/1,000,000 = 4.00. The calculated value exceeds the threshold in Table 1 (3.6) for four-lane highways with a speed limit of 40–45 mph. Therefore, channelization or approval of a deviation is required for approval of the application, *unless* the Region Access Management Engineer or other qualified staff determine that the existing or proposed channelization conforms to the design requirements of the HDM.

Determining Site Average Daily Traffic (ADT)

For the site ADT, refer to the existing or proposed ADT from the approach application. Use the existing site ADT when a new application is required for change of use (OAR 734-051-3020(2)) and no increase in trips is proposed.

Determining Highway Average Annual Daily Traffic (AADT)

The Traffic Volumes and Vehicle Classification website may be used to determine the AADT for a specific highway location. This website, located at http://highway.odot.state.or.us/cf/highwayreports/traffic_parms.cfm, uses ODOT highway numbers rather than the route numbers familiar to the general public.

To determine the ODOT highway number for a specific route, use the map at this link: http://gisintra.odot.state.or.us/TransGIS/. Zoom in and pan, as required, to view the area of the new approach and to display the highway name and ODOT highway number with the proposed approach. To find the mile point of the approach, click the Basemaps button and select the appropriate aerial photo to help locate the proposed approach. To display mile points, on the Display tab, select Layer Catalog. Under Road Network, select Highway mile points to the hundredth value (maximum zoom) and click Apply.

With the Oregon Highway number and the mile point location for the approach, go to the Traffic Volumes and Vehicle Classification website. Select the Highway number from the drop-down menu. Enter the beginning and ending mile points that bracket the approach. Click Search. If the search criteria are too tight, no values will be returned. In that case, consider using the mile points about five miles on each side of the site and expand the search as needed. Once data is returned, choose the AADT at the adjacent mile point that is closest, but lower than the mile point for the approach.

Determining the Number of Highway Lanes

A 2-lane highway is a highway segment with two through lanes, one lane in each direction of travel, with or without dedicated left turn lanes. The Department shall determine if a 2-lane highway segment with dedicated left turn lanes can be considered as a 3-lane highway.

A 3-lane highway is a highway segment with two through lanes, one lane in each direction of travel, and a continuous two-way left turn lane (TWLTL). The 3-lane highway is not included in thresholds because the TWLTL is assumed to provide adequate channelization for the approach.

A 4-lane highway is a highway segment with four through lanes; two lanes in each direction of travel, with or without dedicated left turn lanes.

Right turn lanes, acceleration lanes, deceleration lanes, climbing and passing lanes are not counted in determining the number of highway lanes for evaluating channelization thresholds.

Determining Speed Limit

A site visit can determine the posted speed at the approach or the reviewer can check the following website: http://highway.intranet.odot.state.or.us/cf/highwayReports/speed_parms.cfm. This website uses the ODOT Highway number discussed in the section on Highway Traffic Volumes. The reviewer may also want to document any advisory speeds in the influence area of the approach.

Determining Conformance of Existing Channelization to HDM Requirements

Sections 8.2 – 8.5 of the HDM provide design standards for left and right turn channelization and are used to determine whether existing channelization conforms to the design requirements. Refer to Figure 8-8 for right turn channelization and Figure 8-9 for left turn channelization. Major elements include storage distance (L), S-distance and width of turn lane (X), and signalization. Minor elements include taper rates, T-distance and shoulder widths. These elements should be reviewed against safety or operation concerns of OAR 734-051-4020(3).

If the existing turn lane meets the specified design requirements and no safety or operations concerns exist, then the channelization standard is met. The Region Access Management Engineer may determine through a deviation that the existing turn lane is adequate when the design requirements are not met; this does not require a design exception.

Determining Conformance of Proposed Channelization to HDM Requirements

Sections 8.2 – 8.5 of the HDM provide design standards for left and right turn channelization. Turn lane criteria in Chapter 12 of the ODOT Analysis Procedures Manual (Version 2) is used to evaluate the need for left and right turn channelization.

Proposed channelization must meet the design requirements or be approved as a design exception, per Chapter 14 of the HDM. A design exception does not require a deviation since the approval of the exception establishes the new design requirement.

Deviation Requirements

A deviation is needed when a threshold is exceeded and either of the following occurs:

- The Region Access Management Engineer decides that an applicant's proposal to provide channelization conforming with the HDM requirements will not be required; or
- The applicant requests not to construct the required channelization or requests to construct channelization that does not meet HDM requirements.

The applicant may request approval for a deviation from channelization standards. Applications that request deviations

- Must identify all deviations needed and any dependency or relationship that they have with one another; and
- Must include a traffic impact analysis prepared by a professional engineer, unless waived by the department.

The Region Access Management Engineer may approve or deny a deviation from the standard as set forth in OAR 734-051-3050(7) or (9), respectively. The Region Manager, not a designee, may approve a deviation as set forth in OAR 734-051-3050(10).

Each site is unique and needs to be evaluated based on local conditions. Approval of a deviation at one location may not be appropriate for another location. As a minimum, the turning movements into an approach should not exceed Oregon Highway Plan mobility standards. The department may require mitigation measures as a condition of approval of a deviation.

The following are factors to consider that may support approval of a deviation for channelization (left or right turn):

- Left or right turn lane criteria in Chapter 12 of the Analysis Procedures Manual are not met.
- Vehicle distribution patterns and/or alternative access reduce demand for left turns at approach.
- The approach does not pose any of the safety or operations concerns listed in OAR 734-051-4020(3).
- Development patterns, land holdings, highway configuration or other factors make it impractical to meet channelization standards.
- Channelization would interfere with the operation or safety of other approaches in the vicinity.
- Significant environmental issues or concerns are present.
- The approach is moved to a more desirable location.
- Restrictions on turning movements at the approach are restricted (for example, right turns only).
- Site observations indicate there is a low risk of safety problems with turning movements at the approach.

- Mitigation is sufficient to address problems or concerns (for example, developing alternative access.

Once a decision is made, the reasons for the approval or denial of the deviation must be thoroughly documented including the existing conditions, proposed conditions, traffic data, engineering analysis, references to standards, and findings.

Approval to Construct Channelization

The Region Traffic Engineer must approve proposals to install left or right turn lanes at signalized or unsignalized intersections, including private approaches (Traffic Manual Section 100.1). See Sections 405.0 through 405.8 of the Traffic Manual for additional process and required approvals for channelization, including two-way left turn lanes.

Background and Assumptions for Channelization Thresholds

The channelization thresholds were developed to simplify the process for applicants to determine if a development will need channelization (turn lanes). The Turn Lane Criteria charts in Chapter 12 of the ODOT Analysis Procedures Manual (Version 2) were used as a basis for the thresholds. Several assumptions were made about relationships between trip distribution patterns and posted speed, ADT and AADT to develop the thresholds. These assumptions recognize the left turn into the approach as the highest priority movement traveling from a rural into an urban area.

Further information about the assumptions and technical analyses that form the basis of the channelization thresholds is available in a Technical Paper entitled *Background and Assumptions for Development of Channelization Standards in ORS 374.311(5) and OAR 734-051-4020(2)(b).* The Technical Paper is posted on the Access Management intranet website.