

1. Control of access
2. Elimination of bottlenecks or spot congestion
3. Elimination of hazards
4. Site topography
5. Road user benefits
6. Traffic volumes

Other than on a freeway, the inability to provide the necessary capacity with an at-grade intersection is a common warrant for an interchange.

More detailed warrants and general types of interchanges may be found in Chapter X "Grade Separations and Interchanges" of AASHTO's A Policy on Geometric Design of Highways and Streets.

REFINING HORIZONTAL ALIGNMENT

Horizontal alignment is to be reviewed for possible revisions due to information received under Section 2B-1- GROUND SURVEY such as: obvious areas of unsuitable material and/or rock, major utility facility relocations and environmental considerations (such as splitting communities, splitting watersheds, conflicts with National or State Forests and Parks, historical property, archaeological sites, recreational areas, sites affected by noise beyond acceptable limits, etc.). The 2009 General Assembly passed Chapter 120 (HB 2577), which amends the Code of Virginia by adding in Article 15 of Chapter 1 of Title 33.1 a section numbered 33.1-223.2:21, relating to highway noise abatement. The law provides that, for any highway construction or improvement project that includes, or may include, requirements for the mitigation of traffic noise impacts, VDOT should consider, but is not required to implement, noise reducing design techniques, such as shifting the horizontal alignment away from the noise sensitive receptors.*

Horizontal alignment must remain within acceptable limits as prescribed in the Geometric Design Standards (See [Appendix A, Section A-1](#)) unless an authorized [exception](#) is made by the State Location and Design Engineer and, if applicable, the Federal Highway Administration.

REFINING VERTICAL ALIGNMENT

Vertical alignment is to be reviewed for possible revisions resulting from data received under Section 2B-1- GROUND SURVEY such as: soil data (compaction factors, etc.) indicating the need to raise or lower grades for earthwork balances, major utility facilities, hydraulic requirements and considerations such as raising grades to obtain adequate cover for drainage structures and vertical clearances for various grade separations.

* Rev. 7/09

As mentioned above, Chapter 120 of the 2009 Acts of Assembly provides that, for any highway construction or improvement project that includes, or may include the requirements for the mitigation of traffic noise impacts, VDOT should consider, but is not required to implement, noise reducing design, such as placing the roadway in a cut section.*

Vertical alignment must remain within acceptable limits as prescribed in the Geometric Design Standards (See [Appendix A, Section A-1](#)) unless an authorized [exception](#) is made by the State Location and Design Engineer and, if applicable, the Federal Highway Administration.

PERMIT DETERMINATION

The designer shall submit Form [LD-252](#) to the Environmental Engineer with appropriate data. The Environmental Division will review the project and determine what type of water related permits may be required. (See [Appendix C, Section C-4-WATER RELATED PERMITS](#)).

COORDINATION WITH OTHER DIVISIONS AND AGENCIES

After refinements as outlined in this section are made, the electronic files are to be placed in Falcon to allow other divisions and agencies that have been involved up to this point access to the revised plans. For example, furnishing the electronic files allows the Environmental Division to resolve as many problems as possible at this stage (archaeological sites, etc.) and the Local Assistance Division, on applicable projects, to coordinate with city or town representatives.

* Rev. 7/09